

RFID IMPLEMENTATION AND SUPPLY CHAIN ALIGNMENT: THE CASE OF JEWELLERY IN THE RETAIL INDUSTRY

G. NEUBERT, I. ZAHOU

LIESP / ESC ST Etienne
51-53 Cours Fauriel
42009 St Etienne Cedex -France
gilles_neubert@esc-saint-etienne.fr
Ishraf.zahoui@esc-saint-etienne.fr

C. DOMINGUEZ

University Jean Monnet Saint-Etienne,
Coactis laboratory,
6 rue basse des rives 42023 Saint-
Etienne, France
carine.dominguez@univ-st-etienne.fr

B. AGERON

University of Grenoble, IUT Valence,
CERAG Laboratory,
Rue Barthelemy de Laffemas, 26 000
Valence, France
blandine.ageron@iut-valence.fr

ABSTRACT: *Firms cannot be competitive if their information systems' strategies are not aligned. The Strategic Alignment Model (SAM) developed by Henderson and Venkatraman (1993) considered the strategic alignment as a standalone challenge between a company and its information system. This concern of alignment has not been empirically extended to the inter-organizational level. In this chapter, we raise the question of inter-organizational alignment and follow how companies, embedded in same supply chains, adapt their information systems and organizations to reach their strategic goals towards their suppliers and customers.*

We conduct a single case study on a jewellery supply chain between a middle-sized retailer and its supplier, a logistics service provider. The longitudinal description of the project from 2006 until nowadays highlights who are the main actors and what are their expectations. We also describe the transformation of physical processes and information flows as well as the IT infrastructure that supports RFID.

KEYWORDS: *supply chain management, inter-organizational strategic alignments, RFID.*

1 INTRODUCTION

Today, globalization and technological innovations call for improved organizational adaptability and more flexible and advanced systems relative to manufacturing, logistics, engineering, information and process technology (Momme, 2002). In order to increase their performance, firms are outsourcing their non core competencies activities and are focusing on their own business.

Obviously, this dilemma of internalization / externalisation of activities leads to an increasingly dependency of business organizations and a greater complexity of the supply chains. In this context, the objective of Supply Chain Management (SCM) is to increase the financial and operational performance of each partner as well as the global supply chain. By enabling a closer relationship between all supply chain partners, SCM achieve cost reductions and revenue enhancements as well as flexibility in dealing with supply and demand uncertainties (Lee and al. 1997, Bowersox and al. 2000). SCM is based on the integration of key business processes, from end user through original suppliers that provide products, services, and information and hence added value for customers and other stakeholders (Lambert and al., 1998). Information Technology and Information System (IS/IT)

supporting the organization and its upstream and downstream partners, have been recognized as critical factors in the improvement of SCM (Koh and Saad, 2006, Neubert and al., 2004). As pointed out by Gunasekaran and Ngai (2004), it is today impossible to achieve an effective supply chain without IT/IS. Since suppliers are located all over the world, it is essential to integrate activities both inside and outside of an organization. This requires integrated information system and information technology for sharing and supporting information on various value-adding activities along the supply chain. IT/IS is like a nerve system for SCM (Gunasekaran and Ngai, 2004).

Based on a literature review, Avison and al. (2004) suggested that firms cannot be competitive or successful if their business and IS/IT strategies are not aligned. Most of the researches have mainly considered the strategic alignment as a standalone problem, i.e. between one company's strategy and its own information system, often based on the Strategic Alignment Model (SAM) developed by Henderson and Venkatraman (1993). So far, this question has not been empirically extended to the inter-organizational level: how do companies, embedded in the same supply chain, adapt their information systems and organizations to reach their strategic goals towards their suppliers and customers? In order to address this question of inter-organizational alignment, we con-

duct a single case study in the context of Jewellery supply chain. This case study focuses on the relationships set up between a middle-sized retailer and its supplier, a logistics service provider. The longitudinal description of the project from 2006 until nowadays highlights the main actors, their expectations; the physical processes and their transformations during the project; the information flows and the IT infrastructure that supports RFID.

The results underline the main difficulties observed during the pilot and the implementation phases as well as the evolving benefits that the retail and its supplier are seeking. Based on the strategic alignment model, we design the different routes of intra and inter-organizational strategic alignments between the two supply chain partners. We outline that these alignments are particularly complex as they include a high number of partners and because they concern two different supply chains: the jewelry one and the tag one. Finally, we observe that these alignments are incremental and are the results of the interactions of both intra and inter-organizational alignments. In fact, each intra-organizational alignment is interrelated and has an impact on partners' intra-organizational alignments. The quality of "local" alignments (intra-organizational alignment) impacts the global supply chain (inter-organizational alignment).

The paper is organized as follows. First, we review past researches on strategic alignment in SC based on the SAM and on RFID technology. Then, we describe the research methodology and the case study we carried out. Finally, we discuss our results and the implications of our work for further research on inter-organizational strategic alignment.

2 STRATEGIC ALIGNMENT IN SUPPLY CHAIN

In this section, we will discuss the question of alignment practice in the context of supply chain. We have decided to choose SAM as the central model to question integration and performance in the supply chain because this model is still relevant both in academic and professional literature.

2.1 The Strategic Alignment Model (SAM)

Henderson and Venkatraman (1993) have built the strategic alignment model (SAM) on two propositions: firstly, the economic performance of a company depends on the strategic fit between strategy and the organizational and technological infrastructures that are deployed; secondly, the strategic alignment relies on a dynamic process of adjustment between strategy and functional integration (organization and IT infrastructure).

The SAM model aims at understanding the dynamic fit between four domains (Figure 1): business strategy, IT

strategy, organization and IT infrastructure. The company is making continuous co-alignments between these four domains in order to optimize their performance.

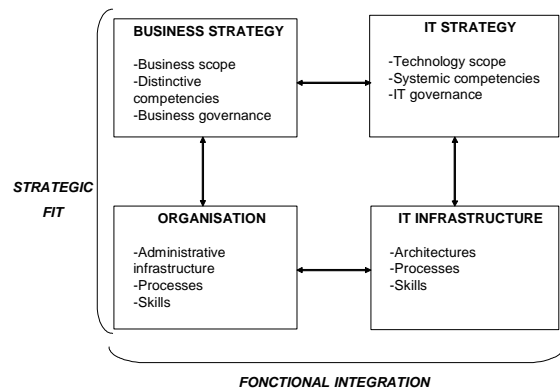


Figure 1: Strategic Alignment Model

Even if the SAM appears to be the reference in strategic alignment, it has been largely criticized. Ciborra (1997) argues that alignment is not the right way to consider organizations that are mainly driven by improvisation and tinkering through the resources at hand. Smaczny (2001) has asserted that alignment, as a geometrical and mechanical approach, is not the appropriate paradigm to manage IT in today's organisations. Finally, Palmer and Markus (2002), based on a basic alignment model and strategy descriptors, have shown that there is no association between fit and performance.

On the contrary, other authors have defended the SAM. Lederer and Mendelow (1989) have suggested that alignment increases the likelihood of developing systems more critical to the organisation and of obtaining top management support for IS. Besides, the application and analysis of alignment will facilitate a more competitive and profitable organisation (Galliers, 1991).

These discussions on the "capacity" of the model to tackle the role of IT in Business Performance are interesting. We agree that one single model can probably not explain the relationship between IT, environment, structure, feasibility, managerial beliefs and performance (Coltman and al, 2007). Nevertheless, we believe that new orientations have to be taken into consideration such as the level of use of IT, not only the nature of IT adopted by companies both in supplier and buyer organizations (Fimbel, 2007). In the same connection, Galliers (2004) and Sledgianowski and Lufman (2005) argue that the alignment issue has to be extended and integrated to an enterprise-wide basis, in a supply chain perspective.

This perspective highlights key questions that are still unsolved (Avison and al. 2004). First, it points out the link between the capacity of companies to align themselves and their level of performance. Secondly it underlines how do companies become aligned one with an-

other. Finally it stresses how alignment can be measured. Nevertheless, trying to give answers to these questions can lead to a better understanding of the factors and connection modes that companies can set up to operationalize their alignment.

2.2 Strategic alignment and performance in the Supply Chain

Despite a large literature on IT alignment (for a detailed literature review on SAM, see Chan and Reich, 2007), few authors have examined this measurement of alignment in the context of supply chain. This lack of attention of the inter-organizational context can be explained by the fact that alignment is merely “an engineering formal structure process alignment”. Thus, it ignores totally business partnerships and the increased need for collaboration in the context of distributed supply sources”. McDonald (1991) has developed a model in which he examined external impacts of alignment on customers, suppliers and markets. Similarly, Henderson and Vankatraman (1998) have recognized that alignment must be both internal and external to organization and suggest that organization must align their business and IT strategies with industry and technology forces. Based on this recommendation, Galliers (2004) also mentions the need to pay attention to alignment both with the main customers and suppliers all along the supply chain. Rey and Neely (2008) have extended Venkatraman’s test of co-alignment in the context of inter-organizational relationship. By capturing successful contractual relationships between supplier chain partners, they observe that effective cooperation relies on business partners’ need to align their performance measures (Yeung and al. 2006, Kaplan and Norton, 2006). They conclude that alignment of inter-organizational relationships performance measures depend on the fit between the contract’s objectives and the partners’ objectives.

Others concepts have been developed to explain the level of alignment: the concepts of modularity and integrality (Voordijk, Meijboom and Haan 2006). Concerning the concept of modularity, three main dimensions have been observed: modularity on product, on process and in a supply chain. Contrary to modularity, integrality is determined by the degree of proximity of elements. This classification shows that there are several factors that can be considered beyond technology itself to understand the level of integrality or proximity in a supply chain. Besides, supply chain modularity refers to whether certain supply functions or tasks are carried out by a single organization or not, to who does what, the allocation of labor, and how different actors interact with each other. Of course, the nature of products also influences the level of integrality in a supply chain. Depending on the industry, the degree of component independence or product modularity can affect a firm’s sourcing strategy. Finally modularity can be summarized by the degree of autonomy of parties involved and their type of coordination. The concept of modular production networks can

be used to specify combinations of different degrees of geographic, organizational, cultural and electronic proximity.

3 RFID (RADIO FREQUENCY IDENTIFICATION)

RFID technology is derived from the World War II techniques to allow aircrafts to identify themselves to other friendly aircraft and commanders on the ground. The technology was developed in the manufacturing automation. From 1998 to 2003, leadership of retail initiatives has been centered at Massachusetts Institute of Technology where in 1999 the Auto-ID Center was established. In late 2003, the Auto-ID Center at MIT officially closed and transferred its intellectual property to Electronic Product Code Global (EPC Global standards relate only to the deployment of RFID into the supply chain). The technology gained more attention when Wal-Mart mandates its top suppliers to adopt RFID technology as well as U.S. Department of Defence.

RFID is a new and non mature IT. Companies only have little knowledge on this technology, how it can be used, on which processes. Scanning the environment is a key step (Avila et al., 2009) to help companies to understand on which processes RFID can lead more value. This constitutes an important external signal for the SAM model that can lead enterprises to redefine their strategy and restructure their organisation.

As an example, RFID provides multiple benefits for the supply-chain. It can add value along the entire supply-chain and related logistical operations and business relationships for more effective business process design. It provides a means of tracking supplier items from supplier through the distribution network to the point of consumption. The possibilities of RFID let its use in the supply-chain somewhat transformational (Niederman and al.2007). Wamba and al (2007) have identified the four main processes that can be directly concerned or affected by RFID. The introduction of RFID can lead to significant Business Process reconfiguration and alignment and new IS practices, such as:

- Put away and Replenishment: The inventory location system will automatically adjust its quantity each time a load is dropped by the put away driver at that location;
- Order filling: pickers don’t have to manually update inventory databases.
- Shipping: RFID could streamline shipping operations as cases are transferred onto trailers.
- Product and asset tracking: tracking systems can generate alerts if any delay and ensure timely delivery instead of human labor deployed for handling and inspection. With increased information visibility throughout the supply-chain,

retailers will be better able to respond to problematic and exception-handling cases.

More precisely, in retail supply chain, Angels and Rebecca (2005) explains that the role of RFID is to streamline inventory management by providing views of product shipments and inventory with high level of details (data on product location, product characteristics, product inventory level).

The major benefits of RFID implementation will come from solutions across the whole supply chain. From an inter-organisational point of view, to take into account all the partners is difficult because there are many disputes regarding sharing the costs and benefits between manufacturers, logistics providers, distributors and retailers (Visich and al., 2007). Nonetheless, IT strategy, business infrastructure and IT infrastructure need to be coordinated in order to better realize the benefits from IT investments. This is the essence of the concept of strategic alignment (Hua and al., 2007).

4 CASE STUDY METHODOLOGY

In this section, we will present the methodology we adopt to conduct the case study

4.1 Methodology overview

The need for empirical analysis in the context of alignment research has been outlined by Chan and Reich (2007), who observed that "research on strategic alignment is too mechanist and failed to capture real life". For this reason, a lot of recent empirical researches on strategic alignment have been done. The majority of them have focused on quantitative methodologies and there are very few case studies focusing on the description of the complexity of RFID implementation project in a supply chain such as those developed by Loebbecke (2007; 2008). We conducted a single case study to reach an in-depth and insight understanding into this contemporary phenomenon (Yin 2003). By taking into account the RFID pilot project, the case study method addresses strategic and operational aspects.

Our case study was performed with one of the main French retailer. The choice of this case study is largely explained by the fact that:

- The retailing sector is a pioneer in the implementation of the RFID technology. Namely, previous research have been conducted in this sector (Germany and Kaufhof and USA and Wal-Mart), but no research has been done in France.
- The company is a precursor in RFID technology projects

- The jewellery supply chain with RFID has never been studied before.
- Moreover, the project studied has overcome pilot phases and is now starting its implementation stage on more than 80 jewel stores.

Data have been collected at the corporate level but also in the retailing centers. Qualitative data have been gathered by using interviewing techniques. We conducted 5 semi-structured interviews with major actors of the retailing company.

4.2 The case study description

4.2.1 The company

Founded in 1898, the Casino Group is a middle-sized leading food retailer, active in more than 10000 stores in multiple retail formats (hypermarkets, supermarkets, urban markets, and discount markets). Its operating performance, which has grown steadily over the past several years, exceeds now the industry average with nearly 25 KE of revenues in 2007. This is the result of the Group's unique position in the market and its ability to anticipate changing lifestyles and consumer practices. The company offers a different approach to retailing, one tailored to meet each consumer's specific expectations. Moreover, the company sought to be responsible not only with its customers, but with its social and economic stakeholders as well. In order to meet these values, the group is precursor and innovative in several domains (for example, the company for its urban network uses river transportation system). The RFID technology project is one of the new challenges; the company has to deal with. It was launched in 2006 with the objective to improve the productivity of sales in "Boutique Or" stores and the reliability of supply processes.

4.2.2 Actors involved in the RFID project

All the actors of the jewellery supply chain of Casino Group are not involved in the RFID project. The participant to this project are:

- Suppliers of jewels: more than 60 worldwide jewels' suppliers dealing with Casino which then distributes the products
- Group Casino: there are different departments involved in the project of the retailer: Casino's headquarters throughout 4 departments, 1) CIO department (called CIT), 2) Purchasing, 3) Supply Chain, and 4) Textile Business Unit who holds both textile and jewellery products
- Casino's 80 Stores called "Boutique Or": in 2009, the company operates 80 stores mainly in France. There are physically settled inside Casino's hypermarkets in France. They directly deal with final customers to sell jewels like watches, rings, earrings, bangles like any other jewellery store. These department stores are

completely independent from hypermarkets in terms of sales policy.

- The warehouse LSP: is a logistics service provider dealing with receiving jewels from suppliers, storing the products, preparing orders, printing RFID tags according to the type of product, and delivering them to the “Boutique Or” stores. Once a year, Casino and LSP jointly participate to the warehouse inventory. LSP is in charge of these services both for Casino and another jewellery store. In order to avoid problems between the two retailing companies, LSP has physically divided the warehouse in two distinctive areas where the products are affected.
- The printer: this company is equipped to produce paper etiquettes from paper rolls and to insert RFID smart chips inside the paper rolls. Finally, the printer will cut up the rolls in order to make specific paper tags that will be added to the jewel in order to describe it (weigh, number of carats etc...).
- The smart chip producer: this company develops UHF smart chips for the Casino group in order to manage their supply chain. They also participated to create specific RFID readers for paper tags as these materials initially did not exist in their offer. This reader can be considered as the hardware material of the RFID project.

4.2.2.1 The physical process and information flows

The Warehouse LSP receives every day products from the suppliers and controls them for the Casino Group. Once the products have been controlled, they are tagged by LSP and stored for a next delivery. Once a week, the « Boutique Or » stores are delivered from LSP. After the delivery, Boutique Or’s sales personnel control the products with the RFID Reader and store or display them according to the status of the product (on stock or on order).

Actually, there are three main processes in this supply chain that go both from the jewel suppliers to LSP warehouse, and then from LSP warehouse to the Boutique Or stores: 1) Day to day receipts, from 60 worldwide jewel suppliers to LSP, 2) Weekly delivering, from LSP to each Boutique Or store, and 3) LSP’s inventories each year.

4.2.2.2 The IT infrastructure

The IT infrastructure of the jewellery supply chain of Casino is independent from the main ERP system GOLD of the retailer. Actually an IT infrastructure has been specifically developed for the RFID project.

There are three main IS that support the RFID project:

- ERP GOLD: it is the main ERP of the Casino group that aims at centralizing all key data. Today, it is not integrated with SINEX
- SINEX: it is the IS that has been developed for LSP. SINEX is in charge of dealing with both inventories and day to day receipts of jewels from suppliers. LSP also physically holds the hardware materials such as the tag printers and the RFID readers. Both materials belong to Casino.
- IS in Boutique Or stores: is composed of different systems that are not integrated one with another. Each IS is dedicated to a specific task: collection, receipts, inventories, and editing tags when necessary (a paper tag has broken or when prices are changed through promotions).

4.3 The case study analysis

In order to analyse the RFID implementation we use the framework of Fosso Wamba et al. (2007) that we adapt and complete to illustrate our case study.

Fosso and Wamba’s framework, specifically developed for RFID projects, is composed of a sequence of three main phases that describe a RFID project implementation: Opportunities seeking, pilot project and validation and RFID project deployment

4.3.1 Phase 1: Opportunities seeking

This initial phase deals with the opportunities to implement the RFID project in a specific value chain. It is composed of six steps.

Phase 1: Opportunities seeking
Step1: Primary motivation (Why?)
Step2: Analysis of the product value chain (What and Why?)
Step3: Identification of the critical activities (Which?)
Step4: Mapping of the network of firms supporting the PVC (Who and with Whom?)
Step5: Mapping of intra-organizational processes for the identified opportunities as they are (How within organization?)
Step6: Mapping of inter-organizational processes for the identified opportunities as they are (How between organization?)

4.3.2 Phase 2: Pilot project and Validation

The objective of this second phase is to develop a pilot project in order to validate the feasibility of the RFID implementation. With respect to the inter-organizational alignment problem, the goal is to identify the business opportunities that could come from this new technology and to propose process and IT reconfiguration to fit with RFID. It is made of four steps.

Phase 2: Pilot project and Validation
Step7: Evaluation of RFID Network opportunities in the PVC with respect to the product (level of granularity), to the firms involved in the network and to the specific activities in the PVC
Step8: Evaluation of potential RFID Network applications including scenario building and process optimization (“As could be”) (HOW within and between organizations?)
Step9: Mapping of intra- and inter-organizational processes integrating RFID technology.
Step 10: Validating business and technological processes integrating RFID technology with key respondents. Feasibility analysis and evaluation of the challenges including ERP and middleware integration and process automation

4.3.3 Phase 3: RFID Project Deployment

The last phase concerns the validation of the pilot project and the deployments of the technology on the whole supply chain.

Phase 3: RFID Project Deployment
Step11: Proof of concept (POC) with the pilot project: evaluation including ERP and middleware integration and process automation at all the supply chain members’ level and decision to go for the beta test replicating POC scenarios in a real-life
Step12: Pilot replicating and evaluation of anticipated VS realised benefits and impacts of RFID. Appropriation by the different organisations involved and their staff members.

5 INTER-ORGANIZATIONAL ALIGNMENT DYNAMICS DURING THE RFID PROJECT

The project was launched with the idea to insert an innovative IT, RFiD tags inside one supply chain of Casino.

5.1 SAM according to step 1,2

The primary motivation of Casino was to seek, the opportunities of the RFiD technology to improve processes.

An external IT vendor proposed to the Casino Information Technology Department (CIT) to run a preliminary study on RFID implementation (Step 1).

A Casino’s manager, based at the CIT department, interested by developping the idea, became responsible for the project. He pushed the idea to the corporate department of Casino that officially agreed to start the RFiD project in January 2007.

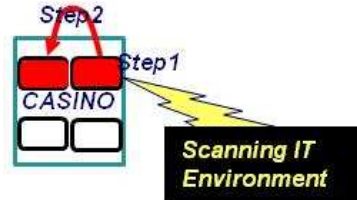


Figure 2: First steps of the Alignment in the RFID project.

5.2 SAM according to step 3,4,5,6

Casino decided to experiment the RFID technology implementation first on the jewellery activities which depends on the textile business unit. The choice of this Product Value Chain was motivated by the reasons that Jewellery activity has its own value chain, independent, from the food supply chain, from suppliers to the points of sales.

The partners involved in the project and the relevant links into the network are: Casino headquarters, its 80 points of sales, and a single logistics service provider.

In terms of information systems, this jewellery supply chain is independent from the main ERP of the group with no direct integration. Besides, this independence is reinforced by the fact that Casino works with an external logistics service provider (LSP) for jewellery products. They contacted the corporate department of LSP and asked them to accept to collaborate in the RFiD project in the jewellery supply chain they were in charge of. The identification of the activities and the mapping of actual intra and inter concerns organisation infrastructure domain of the SAM model.

For Casino, six internal processes are identified for the concerned PVC: 1) Purchasing, 2) Replenishment at the point of sale, 3) Demand management (Warehouse replenishment), 4) IT integration, 5) Selling, 6) Invoicing. The inter organisational processes concern:

- **Delivery** (from suppliers to the warehouse): the warehouse LSP regularly sends orders to jeweleries’s suppliers that are located worldwide. Suppliers then deliver the orders to LSP’s warehouse.
- **Ordering** (from the point of sales to the warehouse): accordingly to the sales in Boutique Or

shops, each shop sends its order to LSP's warehouse via the ERP of the group.

- **Delivery** (from the warehouse to the point of sales): according to the order list of each Boutique Or's shop, LSP prepares the jewels and sends them to the shops.

The activities involved in the value chain for both partners are: reception of the jewellerys at the warehouse, picking at the warehouse, inventories at the warehouse, reception of jewellerys at the point of sales, Inventories of jewellerys at the point of sales.

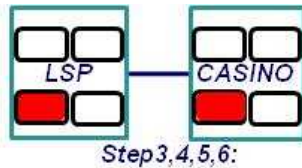


Figure 3: Mapping of the AS IS processes and activities in the actual supply chain

5.3 SAM according to step 7,8,9,10

The jewellery product flow is characterised by Small products manually handled, low level of demand, high value unit, made with metal components (gold, silver etc..) that are not always readable by RFID tags. For these reasons, the IT strategy Department of Casino started to scan the environment to find potential partners that can help them in adapting their IS and developing the RFID technology (step 7 - 8).

An initial scenario of RFID application was proposed. The objective was to define the possible ways of using RFID, within and between organisations. For Casino and its partners, the following challenges and applications were identified:

1. Producing new labels with RFID Tags
2. Tags editing:
 - Labeling the products with RFID tags at the warehouse
 - Labeling the products with RFID tags at the Point of Sales
3. Tags reading:
 - Using RFID for the reception of the products at the points of sales
 - Using RFID for inventory control

The next step consists in defining the "To Be" Intra and Inter organizational processes integrating the new technology RFID. This network not only concerns Casino and its LSP, but integrates new actors with knowledge and competencies to produce the RFID technology

LSP accepted to collaborate in the project and then, aligned both its operational processes to fit with Casino's requirements (receiving, warehouse, order picking and delivery) and IT infrastructure (investing in a smart RFID printer, in RFID readers, adapting their ERP System and developing the interfaces with Casino's IS) (step 9-10).

Casino negotiated with the label producer and asked them to adapt the size/format of their label according to the type of jewel and in order to include the RFID Tag. As the label producer was not equipped to insert the chips inside the labels, Casino asked the Tag producer to realize this task. The Tag producer finally accepted to insert their tags in the labels. This alignment concerns the strategic domain of 3 companies, the Software service provider (ISP), the Label producer and the Tag Producer who accepted to develop new products for the project.

The last step of this phase consists in validating all the business processes, application and technological developments, that are requested for the RFID Project. From the RFID technology side, this step included some specific RFID readers development that were adapted to the case of very small products such as jewellery, label with RFID tags.

From the Information System side, it led to software modifications to insert RFID application into legacy systems: wireless middleware to compare delivery order to the items received, specific Software to write the RFID tags and print on the labels.

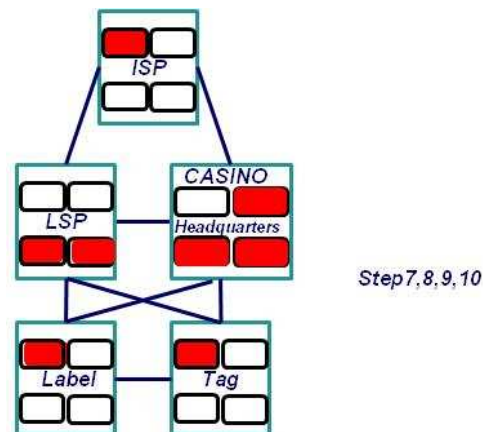


Figure 4: To Be Organisation and Inter organisational Alignment

5.4 SAM according to step 11 and 12

In January 2008, the pilot project of Casino was developed on a unique point of sales, testing different kinds of tags. The pilot process concerned the automatic receiving of the order at this point of sales.

For the Logistics Service Provider, the pilot process consisted in Re labelling all the products delivered to this specific point of sales, after the picking at their warehouse. The objective of step 11 and 12 is to validate the developpement, modification, observation done in the pilot project in order to propose the final To Be organisation.

For Casino, this step includes software update and the design of a new reader more adapted to the case.

For the Logistics Service Provider, this step includes a reengineering of the sourcing business process in order to put the tag while receiving the product, instead of while delivering the product as in the pilot project, and the developpement of an integrated software able to define the tag directly from the IS of Casino.

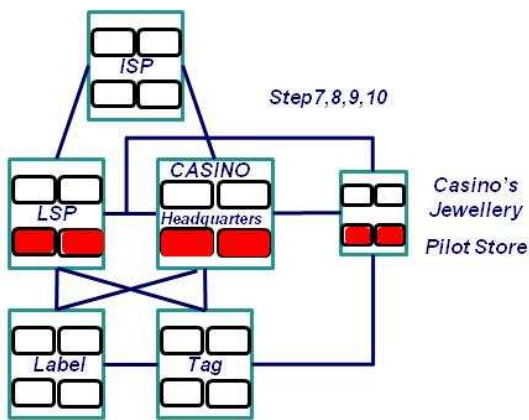


Figure 5: Pilot project and Validation

The final step of implementation is the deployment of the solution to all the Boutique Or stores.

In this step, Casino deployed in April 2009 the designed solution to the 80 point of sales, implementing the RFID Technology and the relevant software, training the users, etc.

The Logistics Service Provider includes a RFID Tag on all products received from the suppliers. As a consequence, all the products in the warehouse are now equipped with a Tag.

The performance improvement of the main activities concerned by the RFID implementation is:

- Increasing productivity at the point of sale by time saving and reducing human errors during reception and inventory control.
- Improving inventory control at the warehouse
- Traceability of jewels all along the supply chain.

6 CONCLUSION

Gunasekaran and al. (2004) have suggested that “the alignment between information model and supply chain models or objectives needs further investigation”. These new research challenges call for:

- an identification of critical success factors of IT for an integrated and aligned supply chain
- an attainment of alignment between IT and business model in the context of supply chain
- an empirical test of the SAM model in the context of inter-organizational relationships

In order to address this challenge, we conduct a research in a jewellery supply chain. The case study provides answers to the dynamics of alignments in a jewellery supply chain. The main conclusions that can be drawn are the following:

- There is not only one strategic alignment but multiple alignments. Indeed our case study outlines that several alignments take progressively place during the two years duration of the project.
- These alignments are particularly complex as they include a high number of partners. This is due to the fact that the supply chain includes not only the horizontal one of the core product (jewels) but also the vertical supply chain of RFID tags. RFID projects actually need a matrix supply chain, both horizontal and vertical, to manage a product composed of a jewel plus a tag.
- These alignments are incremental and are the results of the interactions between different types of alignment in the supply chain. Each intra-organizational alignment has an impact on the other intra-organizational alignments of the partners in the same supply chain. Finally, the extended inter-organizational alignment model can be compared to an eco-system with continuous micro intra-organizational alignments that lead to a global and incremental inter-organizational alignment.

Our research shows nevertheless some limits concerning the methodology. We focus our research on a single case study. Our findings are contextual and cannot be generalized. Moreover, the RFID project is complex due to the fact that the project was emerging and included lots of different actors located in different companies or in different services. This leads to multiple goals and objectives seeking.

7 REFERENCES

- Arshinder, A. K. and, Deshmukh, S.G., 2008, "Supply chain coordination: Perspectives, empirical studies and research directions" *International Journal of Production Economics*, 115, 316– 335
- Avila O., Goepf V., Kiefer F., 2009, "Understanding and classifying information system alignment approaches", *Journal of Computer Information Systems*, Fall, 2-14..
- Avison D., Jones J., Powell P. and Wilson D., 2004, "Using and validating the strategic alignment model", *Journal of Strategic Information Systems* 13 223–246
- Bowersox, D.J., 1990, "The strategic benefits of logistics alliances", *Harvard Business Review*, 68(4), 36-43.
- Bowersox D.J., Closs D.J., Stank T.P. and Keller S.B., 2000, "Integrated supply chain logistics makes a difference", *Supply Chain Management Review*,
- Byrd, T.A. and Davidson N.W., 2003, "Examining possible antecedents of IT impacts on supply chain and its effects on firm performance", *Information & Management*, 41(2), 243-255.
- Chan Y.E. and Reich B.H., 2007, "IT alignment: What have we learned", *Journal of Information Technology*, 22, 297-315
- Ciborra C.U., 1997, «De Profundis ? Deconstructing the Concept of Strategic Alignment», *IRIS n°20*, 13p.
- Coltman T., Devinney T. and Midgley D., 2007, "E-business strategy and firm performance: a latent class assessment of the drivers and impediments to success", *Journal of Information Technology*, 22, 87-101.
- Fimbel E., 2007, "Alignement stratégique. Synchroniser les systèmes d'information avec les trajectoires et manœuvres des entreprises", *Village Mondial*, Pearson Education France.
- Fosso Wamba S., Lefebvre L.A. and Lefebvre E., 2007, "Integrating RFID Technology and EPC Network into a B2B retail supply chain: a step toward intelligent business processes", *Journal of Technology Management and Innovation*, 2(2), 114-124.
- Galliers R.D., 1991, "Strategic information systems planning: myths, reality and guidelines for successful implementation", *European Journal of Information Systems*, 1(1), 55-64.
- Galliers, R.D., 2004, "Reflections on Information Systems Strategizing", in C. Avgerou, C. Ciborra and F. Land (eds.) *The Social Study of Information and Communication Technology*, 1st edn, London: Oxford University Press, 231–262.
- Gilmour P., 1998, "Benchmarking supply chain operations", *Benchmarking : An international journal*, 5(4), 283-290
- Gunasekaran A., Patel C. and Tirtiroglu E., 2001, "Performance measure and metrics in a supply chain environment", *International Journal of Operations & Production Management*, 21 (1/2), 71–87.
- Gunasekaran A., Patel C. and McGaughey R.E., 2004, "A framework for supply chain performance measurement", *International Journal of Production Economics*, 87, 333-347
- Gunasekaran A. and Ngai E.W.T., 2004, "Information systems in supply chain integration and management", *European Journal of Operational Research*, 159, 269-295
- Hanman, S. 1997, "Benchmarking your firm's performance with best practice", *International Journal of Logistics Management*, 8(2),1-17
- Henderson J.C. and Venkatraman N.,1993, "Strategic alignment: leveraging information technology for transforming organizations", *IBM Systems Journal*, 38(2/3), 472-484.
- Kaplan, R.S. and Norton, D.P., 2006, "Alignment using the Balanced Scorecard to create corporate strategy", *Harvard Business School Press*.
- Koh, S.C.L. and Saad S.M., 2006, "Managing uncertainty in ERP-controlled manufacturing environments in SMEs", *International Journal of Production Economics*, 101(1), 109-127.
- Hua G.B. 2007, "Applying the strategic alignment model to business and ICT strategies of Singapore's small and medium-sized architecture, engineering and construction enterprises", *Construction Management & Economics*, 25(2), 157-169.
- Laseter, T., 1998, "Balanced Sourcing: Cooperation and Competition in Supplier relationships," *California: San Francisco Press*.
- Lambert, D. M., Cooper, M. C., and Pagh, J. D., 1998, "Supply Chain Management: Implementation, Issues and Research Opportunities", *International Journal of Logistics Management* 9(2), 1-19

- Lederer and Mendelow, 1989, "Co-ordination of information systems plans with business plans", *Journal of Management Information Systems*, 6(2), 5-19.
- Lee H.L., Padmanabhan V. and Whang S., 1997, Information distortion in a supply chain: The bullwhip effect, *Sloan Management Review*, 43(4), 546-558.
- Loebbecke, C., 2007, "Piloting RFID along the supply chain: a case analysis", *Electronic Markets*, 17(1), 29-37.
- Loebbecke, C., 2007, "Use of innovative content integration information technology at the point of sale", *European Journal of Information Systems*, 16, 228-236.
- MacDonald H., 2001, "The strategic alignment process", *The Corporation of the 1990's: Information technology and organizational transformation*, in S. Morton and
- Miles R.E. and Snow C.C., 1978, "Organizational strategy, structure and process", *Academy of Management Review*, 3(3), 546-562.
- Momme J., 2002, "Framework for outsourcing manufacturing: strategic and operational applications", *Computers in Industry*, 49(1), 59-75.
- Neubert G, Ouzrout Y and Bouras A., 2004, "Collaboration and integration through information technology in supply chains", *International Journal of Technology Management*, 28(2), 259-273.
- Niedermann F., Mathieu R.G., Morley R. and Kwon I.W., 2007, "Examining RFID in Supply Chain Management", *Communications of the ACM*, 50(7), 92-101
- Palmer, J. W. and Markus, M. L., 2000, "The performance impacts of quick response and strategic alignment in specialty retailing", *Information Systems Research*, 11(3), 241-259.
- Rey M. and Neely A, 2008, "Beyond words: testing alignment among inter-organizational performance measures", Working Paper, 1-10
- Romano P., 2003, "Co-ordination and integration mechanisms to manage logistics processes across supply networks", *Journal of Purchasing and Supply Management*, 9(3), 119-134
- Simatupang T.M. and Sridharan R., 2005, "An integrative framework for supply chain collaboration", *International Journal of Logistics Management*, 16(2), 257 - 274
- Sledgianowski D. and Luftman J., 2005, "IT business strategic alignment maturity: A case study", *Journal on Cases on Information Technology*, 7(2), 102-120
- Smaczny T., 2001, "Is an alignment between business and information technology the appropriate paradigm to manage IT in today's organisations?" *Management Decision*, 39(10), 797-802.
- Visich, J.K., Li S. and Khumawala B.M., 2007,, "Enhancing Product Recovery Value in Closed-loop Supply Chains with RFID", *Journal of Managerial Issues*, 19(3), 436-452.
- Voordijk H., Meijboom B. and De Haan J., 2006, "Modularity in supply chains: a multiple case study in the construction industry", *International Journal of Operations and Production Management*, 26(6), 600-618.
- Yeung J.H.Y, Selen, W., Sum, C. and Hou, B., 2006, "Linking financial performance to strategic orientation and operational priorities", *International Journal of Physical Distribution & Logistics Management*, 36(3), 210-221.
- Yin R.K., 2003, *Case Study Research: Design and Method*, Sage Publication