

Portucel/Soporcel inbound logistics: A case study

JOSÉ CRESPO DE CARVALHO

ABSTRACT: The paper describes and documents an entrepreneurial case study, following a coaching methodology. A group of companies in the wood, pulp and paper industry was looking for an optimal solution for an operational problem. While looking for the desired solution to what was mentioned to be an operational problem, the group of companies was faced with the strategic nature of logistics. This led the group to a wide-open discussion on this subject area that, until then, had been out of the question.

Logistics thoughts and principles were, therefore, the necessary incentive to setting up a logistics service provider within the group, to implement a planned fulfilment order system and to redistribute tasks, activities and redesign processes within the group, in order to assure its sustainability.

The case study is a real one and was accompanied by the author of this paper between 2001 and 2002. It refers to the largest Portuguese pulp and paper group, also one of the major players in Iberia and at the European level - Portucel/Soporcel group.

Key words: Logistics & Supply Chain Management, Inbound Logistics, Case Study Approach

TÍTULO: Logística de entrada na Portucel/Soporcel: Caso de estudo

RESUMO: O presente paper tem como objectivo fundamental expor um processo de coaching na área logística de inbound e os resultados daí provenientes. Em termos de investigação, todos os princípios subjacentes ao método de caso de estudo são cumpridos. Refere-se que com este tipo de aproximações, ricas para quem tutela e para os participantes das empresas, se pode chegar a importantes consensos e à discussão de problemas fundamentais. Neste caso, em particular, para se dissipar a ilusão de que um problema logístico poderia ser, eventualmente, tratado como um problema de investigação operacional, tout court, o que veio a permitir à logística, enquanto área empresarial, ganhar uma nova dimensão na organização.

Palavras-chave: Logística e Gestão da Cadeia de Abastecimento, Logística de Entrada, Aproximação Caso de Estudo

JOSÉ CRESPO DE CARVALHO

jose.carvalho@iscte.pt
PhD in Management (ISCTE); Full Professor of ISCTE; Board of Directors of INDEG/ISCTE; Partner of IN OUT GLOBAL - ISCTE and Investigator in UNIDE/ISCTE.
Doutor em Gestão (ISCTE); Professor Catedrático do ISCTE; Director do INDEG/ISCTE; Partner do IN OUT GLOBAL - ISCTE e Investigador da UNIDE/ISCTE.

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6. Contou com o auxílio de vários instrumentos, entre os quais se destacam RECRIA, REHABITA, RECRIPH e SOLARH.

OBJECTIVES AND METHODOLOGY

The Portucel/Soporcel holding, still not legally incorporated, has set up an inter-company team including board representatives from Aliança Florestal, S.A., Património Florestal, S.A., Portucel Industrial, S.A., Soporcel Industrial, S.A. and a sourcing unit from the Portucel/Soporcel holding.

This inter-company team was accompanied, monitored and led by the author of this paper both while appraising the current status of the inbound logistic system and later when determining and validating possible solutions, namely to achieve the following items and specific deliverables:

- analyse the entire wood supplies including entry deposit parks, factory parks and the whole system upstream to the group's own woods (belonging to Património Florestal, S.A. and operated by Aliança Florestal, S.A.) till the external woods and deliveries;
- calculate the optimal flow of quantities per year assigned to each one of the points of the inbound logistics system, identifying bottlenecks, restraints and the corresponding solutions;
- motivate and promote the organizational integration, presenting implementation solutions and decision support elements in terms of sourcing;
- assure the future organization so that the proposed solutions would reduce costs and contribute to eliminating redundant movements as well as creating excellence in processes.

In order to achieve the proposed objectives, the holding Soporcel/Portucel decided to suggest a coaching methodology that had to follow a set of themes. These themes ended up being dynamic and systematically enriched during the time of the project. Initially, the problem and the prospected solution were only positioned to be in an operational research environment. Thus, the initial themes were completely transformed and methodologically added, when necessary, to reach the deliveries the author stated were most important for solving the initial problem from a sustained perspective:

- to study and analyse the transportation, handling, storage, information systems and infrastructures allocated to the whole wood inbound system (see Bowersox, 1978; Williamson, Spitzer and Bloomberg, 1988; Carvalho, 1996, 1999; Bowersox and Closs, 1996);
- to lead and to achieve goals with different individuals and sensibilities in a cross-functional, cross-cultural and cross-company management environment, trying to obtain a common logic, agreements and functional rules amongst them (Scharj and Skjott-Larsen, 2001);

- to provide the group members with logistic main principles, analysis and know-how tools allowing reflection and equidistant proposals (Christopher, 1992; Hines, 1993; Christopher, 1998);
- to schedule tight meetings, to promote in-depth thoughts and steps in order to optimise the whole system and to reduce costs, keeping the investment as low as possible (trying to focus the redesign of the processes to solve bottlenecks and problems) (Hammer, 1990; Hammer and Champy, 1993);
- to fully prepare and call weekly meetings to present working elements and to conclude with remarks and precise documents including general and most interesting agreements to support convenient and sustained solutions (DeBono, 1971; Senge *et al.*, 1994);
- to guarantee the practical feasibility of the optimisation scenarios and emerging solutions (Carvalho, 2002).

This project took place between the last quarter of 2001 and the first quarter of 2002, over six months: two months for analysis; three months for scenario building and brainstorming; and one month to stabilise solutions and agreements established.

INITIAL PROBLEM AND DEVELOPMENTS

The issue and the associated problem(s) were presented in the following mode:

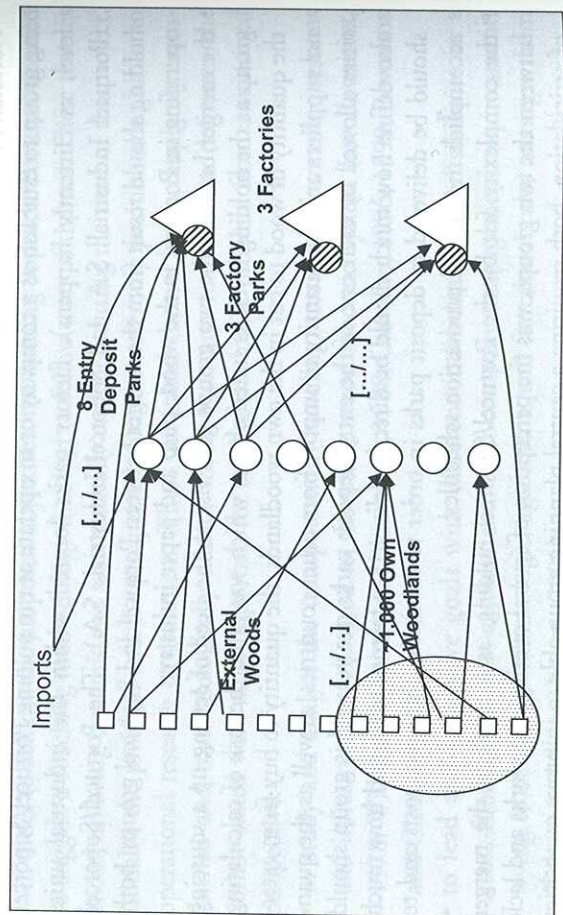
- the Portucel/Soporcel holding is a recent undertaking, not yet incorporated, which should manage the participated companies in the sectors of wood ownership (own woods - Património Florestal, S.A.), forest/woodland management (Aliança Florestal, S.A.), management of entry deposit parks and transport contracts (Soporcel Industrial, S.A.), management of entry deposit parks and transport contracts (Soporcel Industrial, S.A. and Soporcel Industrial, S.A.). The Portucel/Soporcel holding should result from the merger between Portucel and Soporcel groups, both operating in Portugal in the wood, pulp and paper industry;
- the merger between the two groups gave rise to the need of setting up a sourcing group at the holding level, as stated above, which was given the task of calculating the quantity of wood to cut in the own woodlands, the quantity to buy from external suppliers and the quantity to import from other countries, as well as the quantities allowed by each one of the entry deposit parks per year. This group should also define how much should be directly delivered to factory parks and how much should be delivered to deposit parks in order to minimise transport costs and to accomplish the desired production schedules;
- the complexity felt by the Portucel/Soporcel holding, as a result of the merger between the two groups, was the perception of several overlapping works and lack of articulation, both requiring a central planning group able to improve quantities

from various sources, intermediary entry deposit parks and final destinations, *i.e.*, factories;

- meanwhile, the embryonic central sourcing group faced several planning difficulties because they were dealing with more than 1,000 of their own woodlands and numerous small size clients, not specifically known (except through the annual purchasing quantity of wood needed to transform into pulp and accomplish production plans), 8 entry deposit parks located in strategic areas, as referred above, and 3 factories, all in Portugal. Therefore, the major topic for the sourcing group was simply a problem of linear programming (transports centred), with trans-expedition, *i.e.*, 1,000 woodlands and multiple external suppliers feeding 8 entry deposit parks and 3 factories (see Figure 1);
- the market share of the entire group after the merger represented something like 80% of the Portuguese market and, as said above, this made the group a key player in Iberian and European terms. The inadequate planning and fulfilment systems were not in line with the market share of the group and its potential. Minor competitors were more agile and able to introduce turbulence in the market, deviating flows and acquiring external woods easily with prompt payments.

Summing all the information available, more data was required by the author initially and in most of the meetings. The necessary facts and numbers were added to see the problem more clearly and to face it as a strategic one. Finally, with all the

FIGURE 1
Portucel/Soporcel simple flows



information and after several debates, the parties (the author and the group) agreed that if one could envisage the problem 'solely' as an optimisation problem, the needs of the sourcing group and, hypothetically, the emerging company to be created would be reduced. In fact, the sourcing company was only foreseen with other perspectives and activities. In the end, this was proved, and even negotiated, either empirically or conceptually.

HOW TO TRANSFORM A LINEAR PROGRAMMING PROBLEM INTO A LOGISTIC PROBLEM

The issue raised by Portucel/Soporcel group, approximately confined to a linear programming problem, ended up developing one or more answers depending on the years of reference. However, the results required an annual change in flow origins as the years of the woodlands cuts and the wood availability, per area, never coincided regardless of the time horizon considered (five years).

However, the results showed serious constraints and demanded the re-negotiation of the transport tariffs and change of physical circuits each year. Therefore, capacity planning and negotiation skills were necessary yearly which had to be more intensive and dedicated than initially supposed, namely in terms of the articulation between origins (at least the own woodlands), road and rail transports, deposit entry parks and destinations, or factory parks.

Portucel/Soporcel holding recommended estimating the wood flows within the next five years and this has been done. Nevertheless, a whole set of consequences were demonstrated during the project and with additional data that would never have been analysed by the work team otherwise. They are as follows:

- entry deposit parks lost capacity several times during the simulation horizon and, therefore, investment was needed in increasing capacity;
- although the working team agreed entry deposit parks were strategic sites, it was necessary to select which of them should see their capacity improved. Thus, the best locations could be successfully found only after an exhaustive quantitative simulation and brainstorm, introducing qualitative data for the horizon period and the prospected future. During this process, if need be, the wood availability from own woodlands had to be postponed or advanced by two and one years respectively;
- entry deposit parks could coincide with the factory parks, should it be considered useful, widening the parking area of the factory per origin of own woods and expected market availability. Nevertheless, this might require capital injection so that suppliers would not choose closer reception locations, namely those proposed by other operators or Spanish competitors;

- imports and reception of external and own woods resulted in a wood combination that might be suitable for production, or not. This is an important topic that was introduced to enrich the problem and caused considerable adjustments and debates;
- one of the major conclusions derived from all these considerations, among others, led to the in-depth study of the sourcing group roles. This was what the author wanted from the outset. Consequently, the solution could never be reduced to a linear programming output but should be focused on a deeper understanding of the true nature of the problem, *i.e.*, a logistical management problem.

Thus, the analysis of the entire situation should also be focused or driven by the setting up of the group organizational model, relationships, power and decision centres of the various companies, aiming to maintain market leadership and conditions that, although complex, sustained the improvement and the building process of the group.

Several simulations had to be developed in order to obtain the above-mentioned objectives and at first the main issue, an organizational one, was meant to raise several obstacles which meant a reflection on the companies action and appraisal of the logistics process was required if they were to be overcome in a wide sense.

WORKING HYPOTHESIS WHEN FACING THE ENTIRE PROBLEM

Hypothesis 1 - Perform simulations establishing maximum quantities of imported and own woods per year as well as maximum admissible ceilings for market source wood in the entry deposit parks and factory parks.

This approach showed no efficiency towards the maximums established by the work team, because entry deposit parks lost capacity immediately in the second year, as simulated. Hence, the starting point of future simulations would have to be the need to improve deposit parks capacity, scenario building and some decisions and agreements within the work team. This issue was raised at the highest level and was extensively explored to permit the strategic discussion around the sourcing group and its roles.

Hypothesis 2 - This emerged from hypothesis 1 when smooth alternatives were introduced in the woodland cuts. Postponed and anticipated cuts permitted the entire simulation process (for the 5-year period) to accomplish the maximums established. Nevertheless, stability was achieved only with the negotiated improvement of the entry deposit parks capacity, namely when the work team was exploring hypothesis 1.

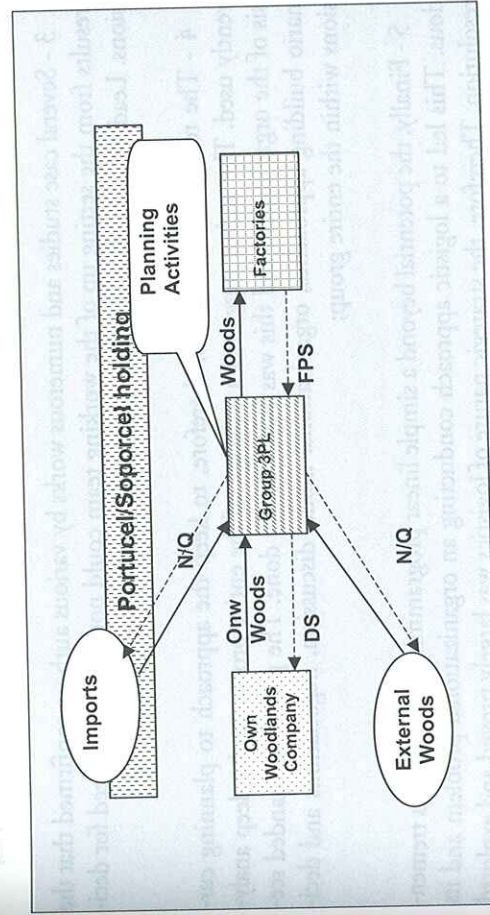
Hypothesis 3 - This was designed to achieve the conclusion of the work and aimed to make all the flows homogeneous either through cut anticipations and postponements or making the quantitative wood ceilings more flexible, either market source or imported. The conclusion was reached although the working team could not accept the import values or the market wood values as one or the other was considered higher than reasonable.

Following the study of these three hypotheses, opportunity was given to understand the organizational problem and the distribution of competences by the various elements that played a role in the value adding system.

The parties accepted that no solutions could be found without improving the entry deposit parks' capacity and without major fluctuations in the flows sources, hence requiring annual negotiations with transport companies.

This scenario granted the sourcing group new powers, which they did not have until the development of the coaching work. In addition, and at the author's recommendation, the possibility (for the sourcing group) of becoming a third party logistics provider for the entire group was more real than hypothetical. This emergent 3PL should own the entry deposit parks and factory parks, as their infrastructure assets, thus subcontracting transports (see Figure 2).

FIGURE 2
Simple proposed organizational model



Note: N/Q - Negotiate/Quantities; DS - Delivery Schedule; FPS - Factory Production Schedule

Factories should act as a single entity and as the woodlands' client. The own woodlands and the management and operation of these woodlands should also be centred in a single entity, acting as a supplier (not the single supplier since the imports and purchased woods still existed). Given these suppliers and factory customers, the sourcing group, operating alone, should then become the logistics service provider for the group.

Factories should concentrate on manufacturing while business and wood planning (group, market or imported source) would be transferred to the logistics service provider. On behalf of the factories, this logistics service provider would have to plan and to negotiate a delivery schedule to accomplish the continuous flows of the factories with its suppliers, at the same time as the negotiation of transport and infrastructures - entry deposit parks and factory parks - management.

CONCLUSIONS

1 - Although not only an optimisation flow issue, *tout court*, the issue led to some reflections on the organizational structure of the group Portucel/Soporcel. A logistics service provider within the group emerged as a result of the initial problem, thus requiring a functions list and addressing some of the most recent and interesting approaches in this area;

2 - The debates and brainstorming sessions were always relevant enabling inter-personal exchange, information sharing and consensus creation. However, the resolution of structural problems required strategic decisions beyond strategy-structure classical approaches;

3 - Several case studies and numerous works by various authors confirmed that the results from the setting up of the working team could not replace the need for decisions. Leadership implies decisions even under a consensus methodology;

4 - The recommendation was, therefore, to keep the approach to planning currently used. The author suggested a redesign of the entire process and a deep analysis of the organisation, and this was subsequently done. The process demanded scenario building approaches, organizational model discussion, negotiations and decisions within the entire group;

5 - Finally, the potential beyond a simple linear programming problem was tremendous. This led to a logistic approach conducting an organizational problem and its resolution. Therefore, the strategic nature of logistics was largely proved and explored (Fabbe-Costes and Colin, 1994).

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