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Methodological Proposal to Evaluate the Alternative of Outsourcing the Transportation Fleet of a Company

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Abstract

The companies have different solutions to transport their merchandise to the customer: have their own fleet, outsource the excess when the transport capacity is exceeded by the demand (mixed system) and the complete subcontracting of all the transport operations. Outsourcing is one of the solutions, in different areas of administration and especially in transportation. Then, being a strategic decision, it is pertinent to ask the questions: should it be externalized? and when?. The answer depends on factors that must be evaluated in each case. To make the decision, it is necessary first to evaluate if transport is a "key success factor" and it is a "basic competence" for the company. It is essential before defining what type of solution to give to the transport and depending on it, when it should be taken to make the business gain a competitive advantage. The proposed methodology distinguishes the relevant factors that allow a successful outsourcing, which are: people, infrastructure, ICTs, logistics management and business strategy, which will allow the development and growth of the business. Likewise, tools for business analysis, management, project evaluation and decision making, play a fundamental role in the qualitative and quantitative study of the proposed methodology, a decision model that allows the evaluation of the fleet's externalization, through the possible transport management solutions. Finally, a map of the evaluation process is proposed, integrating the tools defined for the diagnosis, evaluation and definition of the decision.

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1. Introduction

Freight transport is and will continue to represent a vital activity in the economies of the world. Its participation in a country's GDP goes beyond the published, underlies all other economic areas as a complementary and necessary activity, but sometimes goes unnoticed.

The land transport by means of the trucks is a fundamental piece in the development of the country's activities, given that, thanks to road transport by road, it is possible to move the goods and services to the different localities of a country. The trucks move goods to industry such as forestry, construction, mining or agriculture, even in the mobilization of material in large production sites.

Logistics processes are undergoing radical changes in recent times, so that the outsourcing of services takes on strategic importance for those companies that seek greater profitability. However, making a good choice of when and which logistics operator to entrust the task is not easy. However, companies in general, have long been abandoning self-sufficiency and adopting specialization strategies as a way to join forces in the search for higher levels of competitiveness, leaving those activities that are not part of the main denominated or "Core business".

Outsourcing transportation is one of the most recurrent decisions in this trend, leaving transportation in the hands of specialists in the function allows companies to dedicate themselves to their business and reduce fixed costs, and ultimately gain a competitive advantage. But this delegation is not free of risks, so it comes to play a fundamental role the different analysis tools for making the best decision.

The objective of this work is to produce an adjusted tool to evaluate if it is convenient to outsource and when the transport of cargo for the production and service companies. At present, the small and medium companies that produce or generate physical flows of merchandise do not have a specific methodology that allows them to answer these questions.

There are mathematical models and optimization methodologies that allow representing a number of real-life phenomena, and the area of transport is not deprived of it. Transport demand determination models, for the decision making in the evaluation of investment projects, optimization models of logistic networks, will be a reference for the search of the methodological proposal, objective of the project.

Finally, it is expected to determine the best time to perform the outsourcing of the cargo transport service, which ultimately supports the decision of its implementation and when, which is translated into a contribution in the search to improve efficiency levels in logistics operations of distribution transport.

2. Related works

With regard to decision-making to outsource transport, according to Ogorelc[1], if the external company carries out the activities more efficiently than the company itself, it must be allowed to carry out its activities; with this, the company that outsources, will be able to dedicate itself to its basic competences, in order to gain participation in the individual markets, on the other hand Prahalad, C., & Hamel[2] focus on the basic competences of a company that is, considering a critical factor of success, ensuring the Long-term survival of the organization. According to Stojanovic[3] outsourcing is a widespread trend, but this is not possible without adequate comparable research on the real role and importance of transport on its own, it is recommended that the transport of goods that are advisable not to outsource, can be waste, domestic extractions, minerals and raw materials, and food and beverages. Self-transport is considered more appropriate for short distances and smaller quantities, as well as one that requires multiple deliveries in a single urban area. There is evidence that shows that case-by-case analysis, whether externalizing or not, is complicated due to the possibility of applying mixed solutions.

On the other hand Zhu[4] says that logistic outsourcing has been widely adopted by companies as a means to reduce costs and increase flexibility. Logistics outsourcing processes must be managed with appropriate management mechanisms. Basic outsourcing and advanced outsourcing, this is possible to adapt to the outsourcing of transport.

To help understand the factors that influence the configuration of commercial models of shared services, Joha & Janssen[5] provide a first conceptual model that addresses the problem from a holistic perspective, for which it identifies 12 factors that influence the form of commercial models of shared services, including route dependence,

legal / regulatory driver, customer orientation, target segment, strategic importance, ICT / business orientation, degree of outsourcing, integration potential, economic logic and business value .

Regarding the critical success factors in logistics management: Jimenez-Sanchez [6] and Czischke [7] identify the critical success factors in the SCM. They address the issue based on the definition of the logistics management concepts of the supply chain and business integration.

From the analysis of the literature from which the most common factors studied by different authors are extracted, which are classified according to their effect on performance in SCM. Jiménez-Sánchez [6], uses multicriteria techniques as an analytical tool, incorporates the decision-making process, and reflects the relationships and influence between the actors and factors, approaches and perceptions associated with the most general and least structured part of the problem, the environment.

It is recurrent that, in order to make a decision, it is necessary to interact or use formal procedures that support it and help to have all the antecedents in sight. There are formal procedures such as: equilibrium point analysis, preference matrix, decision theories and decision tree, among others, being the first two of interest in this work Krajewski [8].

3. Problem statement and case study

In the small and medium-sized production and service-generating companies, which have their own truck fleet, there is no feasible, low-cost methodology for evaluating whether and when to outsource cargo transport, which is appropriate. get to help the efficiency of operations and to facilitate reaching a competitive advantage. In this context, from the small to the large companies, they make their evaluations of the type of fleet (own, externalized or mixed) from a case-by-case analysis and almost instinctively Fullerton [9] then to evaluate the convenience of outsourcing, criteria are used that do not necessarily obey an objective rule associated with cost or business strategy.

As for small and medium enterprises (SMEs), they also have this problem. This type of companies, start their activities, generally, informally or at a very low level; then by common sense, the owners or partners of the business, will want to have their own means of transport and distribution, since it will grant them security and the vehicle and drivers will be "part", in many cases, of their other activities (administrative, transports several, etc.). However, it is expected that, with the development and growth of the business, sales and therefore cargo flows will increase, thus causing a need to have different types of vehicles depending on the area where the product is shipped or destined. The case study is the food distribution company "Fullerton", a family business with more than 50 years of presence in the Valparaíso Region, Chile. It commercializes pet food, pastries, flours and legumes through different sales channels, from direct sales in its different branches, telephone orders, as well as electronic sales from its web platform, generating the delivery at home; to different places in the area, for which it has its own fleet of trucks and whose transportation is managed by its owner, according to his experience, but without any formal technical control parameter Fullerton [9].

When facing the possibility of carrying out a process of logistics subcontracting, in this case of transport, it is necessary to find out if it really convenient or not, always looking for greater competitiveness for the company. The option to do so by the company requires facing a certain level of investment, while subcontracting allows the use in other areas of that capital to be invested, as well as transferring to the supplier of the service, the risk linked to the management of activity. To identify and quantify the risk and decrease the probability of failure in the strategic decision, it is appropriate to perform an evaluation with established procedures and not improvised or biased by personal perceptions.

In this case, we are working on the development of the decisional methodology of Ogorelc[1] referred to the outsourcing of distribution transport, taking into account that it is necessary to identify those key success factors in this field, specifying whether or not transportation is a basic competence of the company. For this, two tools are designed (questionnaire and checklist, mainly), with an interval measurement scale, typical of non-probabilistic statistics, based on the Linkert scale. The first have to be answered by the owners or managers of the company and the second have to be filled in a technical inspection by the evaluator. This allows us to have a tool that helps to determine if the company's transportation is a key success factor and the second if transportation has become a basic competence of the organization or is close to achieving Hitt [10].

4. Solution proposed

They are detailed and described in the process diagram below, as a solution proposal based by Ogorelc[1] and Hitt[10].

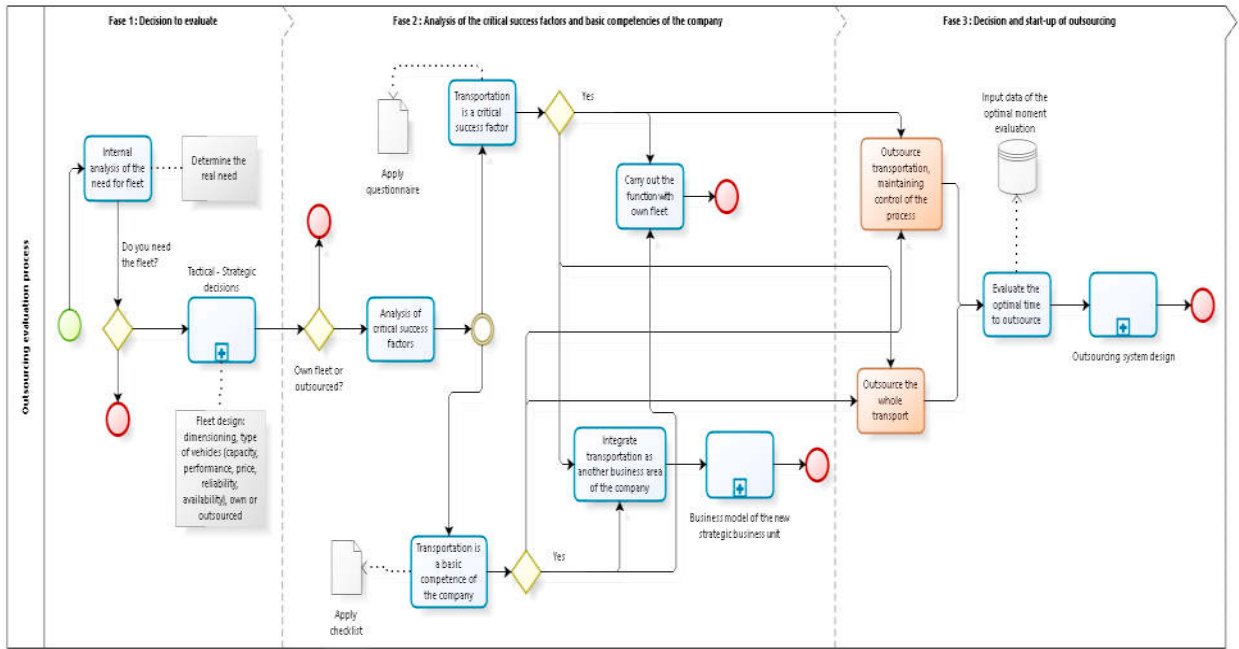


Fig. 1. Diagram of the evaluation process based on BPMN Bizagi [11]

Phase 1 aims at finding the real need to outsource the transportation of goods. The following table shows the decision criteria:

Table 1. Decisions of the first phase of the evaluation methodology

Type of decision	Decision	Explanation
Tactic - Strategic	Fleet design	How many vehicles? (fleet size variable or fix, dimensioning)
		What type? (capacity, performance, availability, reliability)
		Owned or outsourced fleet?
Operational	Allocation of vehicles to tasks or clients	Trucks with various compartments? Transshipment.
		How many tasks to be undertaken?
		What type of clients? (periodical deliveries, steady, random).
		Where is origin/destination located? (from warehouse to clients, return trip between origin/destination).
		Number of deposits, branches, etc.? (single or multiples).
	Vehicle routing	Deterministic, semi-random, random demand?
		Frequency of trips? Working hours, trip times and distances, penalties for not meeting due dates, routing with stocks, congestion problems, ways of routing solutions (direct calculations, approximate number of clients per vehicle, simulation, mathematical model, static routing, dynamic routing incorporation of technology (TICs))
	Working zones	

The process diagram shows, in phase 2, two alternatives: Carry out the function (transport) with its own fleet, ending the evaluation process there; or integrate transport to the company as another business area to be developed and exploited. It is proposed, then, to continue with an internal process of raising the business model of the transport activity as a new Strategic Business Unit.

Subsequently, in phase 3, "Decision and start-up of outsourcing", we have as a result of the second phase, for which two possible alternatives of solution are studied. In both there is the convenience of outsourcing transport, but with different depth. One of them is through a mixed system that suggests outsourcing transport, but maintaining control of the process. On the other hand, it is suggested to outsource transport in its entirety. In both cases you must go to the next activity that is "Evaluate the optimal time to outsource transport", for which it is required to have a series of input data of the operation of the company, such as number of trucks, operation of them and others. With the above, and after an exhaustive investigation and collection of data and additional information, it is proposed to design the outsourcing system, taking into account the general, specific and additional aspects defined and collected in Phase 1 of the evaluation process diagram, described in Table 1, to carry all the requirements and definitions to the contract.

For the analysis of critical success factors, the proposals by Jiménez –Sanchez[6] and Hit [10] are considered, for which the decision-making model of logistics outsourcing Ogorelc[1] is adapted to generate a decision methodology for transport . In this methodology, it is necessary to consider, in a first stage, the question of whether transport is a key factor of success for the company and, subsequently, a second question of whether transport is a basic competence of the company. Both questions require a binary response, that is, YES or NO. The combination of answers will suggest four possible paths in management, which are shown in Fig. 2.

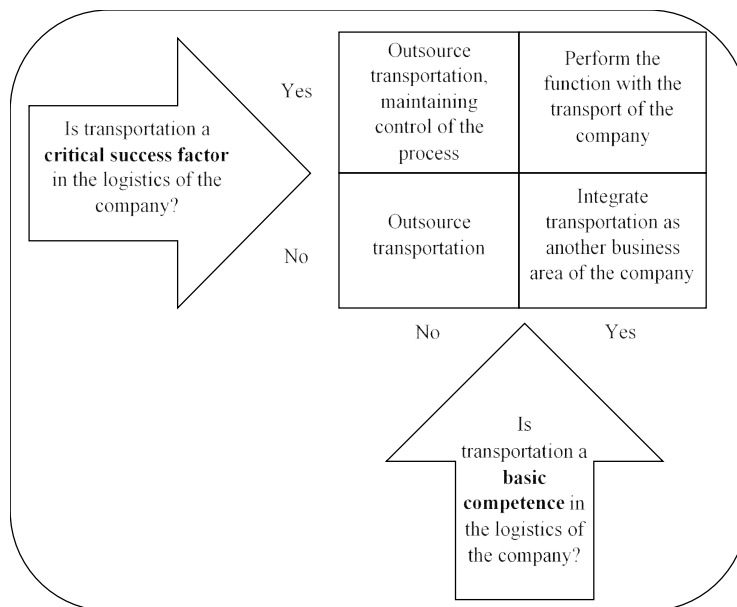


Fig. 2. Decisional model of outsourcing transportation based on Ogorelc [1]

In order to determine if the transport of the company is a key success factor, it is necessary to evaluate and analyze how this service contributes and adds value to the main activity of the company, achieving in definite way to contribute to a competitive advantage in front of the competitors of the company. same, where are valued what are the scopes of the contribution of transport to the success of the company.

5. Application in the study company

The company has 10 service centers, where it delivers its products according to the market needs of these.

The company according to a study determines the following key areas for the success of the company, based on the development of the business:

Table 2. Key areas

Area	Component
Quality products	Appropriate suppliers
	To identify the needs of the clients
	Reasonable price
Quality of service	Variety of attention channels. Physical shops, web pages.
	On time delivery
	Attitude toward good service to clients
Human capital	Work competences
	Experience
	Responsibility
	Commitment
Facilities and equipment	Attention points close to the clients
	Appropriate location of distribution centers
	Reliable transportation equipment and in the right quantity

The proposed methodology was partially applied in the company and the recommendation was not outsourcing, given that transportation is a basic competence and a critical factor of success. This based on Fig 2 and checklists according to the proposal of Ogorelc[1]and adapted by the author for the transport area and because in this case the transport makes multiple deliveries in a single urban area Stojanovic [3].

With this, the information and data required and the effectiveness of the proposed process will be adjusted in practice.

6. Conclusions

It was possible to distinguish the key factors that allow a successful outsourcing. Aspects such as people, infrastructure, ICT systems, logistics management and business strategy, allow to achieve good results.

When investigating the state of the art of studies and cases related to the decision to outsource the logistic functions, we obtained the analysis of a series of documents in which the specialists and researchers have worked to identify the trends, the keys and critical factors at the time. to evaluate and implement an outsourcing in different areas, one of them being distribution transport.

With the above, it was possible to propose a decision model that allows to evaluate the outsourcing of the fleet, through the use of a methodology that provides the four possible transport management solutions in a convenient way to the SME that can be examined.

However, a map of the evaluation process was proposed, integrating the tools defined for the diagnosis, evaluation and determination of the decision, by means of the design with the help of the BPM.

It is recommended to apply the complete model to other small and medium companies.

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