

Strategic logistics: Re-designing companies in accordance with Lean Principles

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Abstract. This paper attempts to show how Lean Thinking and Strategic Logistics concepts applied to Organization's design and structure can result on an effective and efficient approach. A Strategic Logistics organization model was developed, in accordance with Lean Thinking principles. A pilot project was implemented in a small group of SME's and now it is being prepared to be implemented in a technological park. The model addresses a simplified organization structure with two branches or dimensions - Logistics and Mission - based on Business Process Management (BPM) and Activity Based Cost and Management (ABCM); it eases the outsourcing of non-nuclear activities and establishes a proper framework to increase the focus on organization's core business. With this approach considerable advantages are expected to be achieved, such as fewer activities, less processes, less people and less costs. In addition, higher service level, effectiveness, efficiency, more flexible organization, and a better image are expected. The innovation work related to this paper is an attempt to implement Lean Principles at a superior level of the organization: the organization design level.

Keywords: lean thinking, strategic logistics, business process management

1 Introduction

Searching for competitiveness became an increasingly complex activity; organization management is nowadays exposed to a larger number of new requirements that demands new skills. The answer for this growing complexity is the use of a 'tool' named integration, which has been proven to result in better effectiveness and efficiency.

In this way and seeking to become more competitive, organizations begin to made big efforts to self-concentrate on their own core business, transferring support activities to outsourcing. This approach, considered a competitive advantage by some authors and practical studies^[25], requires the organization's core business to be identified and clarified.

A reasonable and expectable result is that the organization will develop itself only those activities really needed to accomplish its mission. Along with continuous integration of different management aspects organizations seek to concentrate on their core business, thus transferring support activities to outsourcing.

Nevertheless, outsourcing can only be an advantage if organization's management will be structured in such a way that accurate planning and activities' control can be guaranteed; otherwise, objectives will not be reached at al. In order to do so, we need to build an integrated management system that can encompass all support activities, which, in our model, we name "Strategic Logistics".

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1.1 Background

With the emergence and growth of the globalisation scenario, organizational dynamic has been gaining speed, thus bringing new challenges and forcing organizations to rethink the way to interact with external and internal environments. Actual scenario includes a very significant pressure from a society that every day comes with new ideas because of the growing media power. In addition, inside organizational frontiers and the falling of the conceptual barriers between employer and employees leads to the re-evaluation of working conditions (see Fig.1).

Looking around, organizations are seeing the emergence of new competitors from every part of the globe that by assuming an electronic dimension have a significant capability to reach customers and by incorporating innovation and technology could easily get ahead of its competitors. In this growing complexity, management became chaotic; the classic organizational structure, vertical, departmental and hierarchical, has been pushed away by flexible and objective oriented organizations conceived in function of the processes they serve^[8].

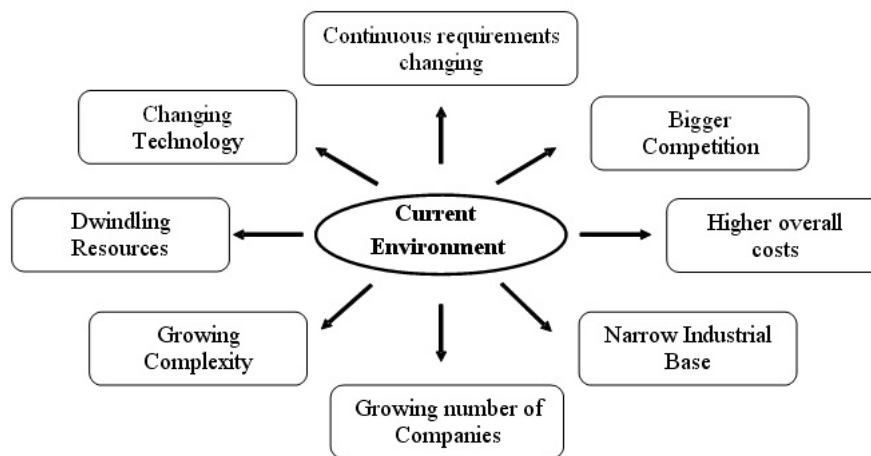


Fig. 1. Main elements of nowadays background

2 Logistics

Logistics, as defined by the Society of Logistics Engineers (SOLE), means, “Integrated design, management and operation of Human, Physical, Financial and Information Resources, during product, system or service life time”^[18]. Some years before, Alba^[1] already defended that Logistics was a very wide field containing different functions like:

- Maintenance;
- Human Resources;
- Supply;
- Facilities;
- Transportation;
- Training.

More than 30 years later authors such Jones^[14], consider also Data and Computational resources as a Logistic element. This fact is an evidence that Logistics is a dynamic and evolving discipline that, as time pass and reality changes, includes new areas needed to achieve its purpose: to guarantee the proper support to mission accomplishment. More recently, the analysis of present reality and new requirements led to a thesis defending that Quality, Environment and Safety (QES) are also Logistics elements^[4] as shown in Fig.2.

With so many variables and their interdependence, organizations realized that was not enough to act on only one variable to produce the results they expect. In order to solve this problem, integration seems to be the better tool.

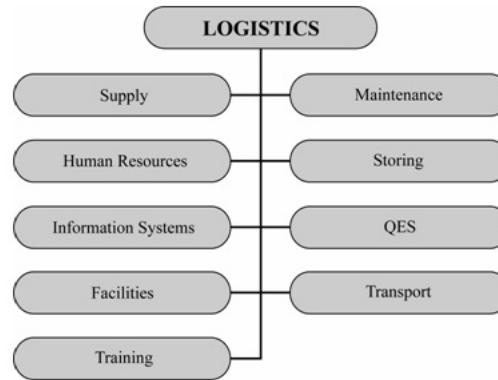


Fig. 2. Present logistics elements

In a very short way, we tried to explain that Logistics is in a continuous evolution and its elements have been adjusted as technological progress is changing, in order to assure its main function. As Admiral Henry Eccles said^[9], Logistics cannot be defined in a single, simple and permanent way; it is a wide field where several activities interact, resulting, when applied together, in a so-called Logistics science. SOLE as well many other authors recognize Logistics as a conjunction of interdisciplinary activities that should be implemented, managed and organized as integrated systems and sub-systems.

2.1 Strategic logistics

Regarding the analysis of Logistics evolution, we have to consider its main dimensions Strategic Logistics and Applied Logistics^[13]. Strategic Logistics is the Logistics level where the full process of planning, coordination and allocation of persons, materials and services, needed for product or service realization, take place. Applied Logistics considers two phases:

- **Logistics Engineering** that includes the activities of planning and obtaining necessary resources before their use;
- **Operational Logistics** is oriented to the needed activities to keep systems operative^[3]. Logistics Engineering encompasses the following activities:
 - Identifying - the necessary support;
 - Selecting - the adequate choice;
 - Persuading - for the necessary acceptance;
 - Tuning - for the correct adjustment;
 - Supplying - The more capable solution;
 - Measuring - solution's effectiveness and efficiency;
 - Improving - System's engineering.

In cultural terms, or the way to look at Logistics and its components, we may observe:

- Strategic Logistics or Strategic Thinking - someone that sees the global picture;
- Operational Logistics - reactive attitude or problem solving.

The importance of clearing up these two different phases as Heskett, Glaskowsky and Ivie^[12] explained, leads to significant gains of money and time.

For conventional organizations, challenge means to develop a Logistics capacity that can help to satisfy the main requirements of their customers to an optimised cost. However, leading organizations in their sectors already learned that both design and operation of logistic system is a competitive advantage^[26]. The analysis of these authors goes furthermore concluding that organizations gaining strategic advantages supported on Logistics competences define the competition paradigm in their sectors.

2.2 Lean thinking and lean management

The Lean management approach, developed by Taiichi Ohno^[19] at Toyota Motor Corporation in Japan, forms the basis for the Toyota Production System. This new structural approach and the way Toyota used lean production to change the nature of automobile manufacturing, has been better described in the book *The Machine that Changed the World*^[28].

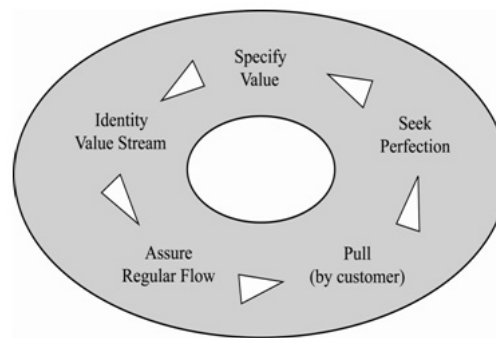


Fig. 3. Lean thinking principles and dynamic

Later on, as shown in Fig.3, Womack and Jones^[27] exposed many practitioners to Lean by focusing on the application of five fundamental concepts:

1. Specify value (from the customer's perspective);
2. Identify value stream (i.e. understand all activities);
3. Flow (minimize interruptions during processing);
4. Pull (all work is initiated by customer demand);
5. Perfection (the goal is zero waste).

However, Lean is successful only when the entire company infrastructure is consistent with the goals of Lean. Emiliani^[10] exposed the advantages of global efficiencies, continuous improvement, and a supporting culture for Lean.

Lean principles have an increasingly application not only in manufacturing domain, but also in service accomplishment. The main principle is the same: an effort to improve customer service through the elimination of waste^[16]. Service industries where Lean has been implemented include insurance, education, and environmental consulting. Applying Lean Thinking to services may become easy considering, for example, the work is usually initiated by customer requirement.

In fact, Lean principles are generally applicable to different processes, industries or organizations. Spear and Bowen^[23] provide a conceptual framework that may be well suited for understanding how this can be put in place. This framework includes four fundamental principles providing guidance how service systems should be structured and managed:

1. Standardization of all work in terms of content, sequence, timing, and outcome;
2. Every internal customer-supply contact must be direct and unambiguous;
3. The flow of every product and service must be simple and direct;
4. Improvements should be accomplished in a structured, scientific manner.

To implement these concepts and evolve towards a lean organization also some additional measures have to be taken^[23]; such as:

- Any downstream department is a customer;
- Teams have to be oriented for overall business value;

3 Model and methodology

3.1 Strategic logistics organization model sustain

In a way to a superior level of integration, where we intend to reach an organizational model based on Strategic Logistics, it is naturally relevant to know if there is a proper support to that kind of evolution and, above all, by the end, real advantages will be achieved. As we have seen before, complexity is a natural element of the present reality also resulting from growing individual specialization, which leads to the raising of barriers among organizational functional areas. It is an irreversible way, since knowledge increases, complexity increases and, therefore, integrating becomes the most capable action.

The general observation of organizations shows that functional split, resulting from classical approach, leads to conflicts about resources allocation, different status of objectives, etc, conflicts needing managing. In basic analyses, Integration means conflict resolution and that is another reason of being the tool that better deals with complexity.

The importance of integration is also shown in General William Pagonis words^[20], after Gulf war. In his words, the integration of the broad dimensions of Logistics it's possible, desirable and necessary, leading to better levels of effectiveness and efficiency. This analysis on a reference organization, characterized by a high level of rigor and well-trained practices, in terms of specialization and decentralization, emphasizes the conclusion for a necessary Integration. The examples showed by Pagonis clarify that, by a lack of Integration, different functions does not work together despite they have been well done on their own.

A study^[6] about organizational integration^[21] revealed many advantages such as:

- Efficiency - lower allocation of resources to reach a desired result;
- Flexibility - higher capacity to react to different situations;
- Trustability - level of confidence in the obtaining a result;
- Innovation - adding value by paradigm changing;
- Consistent Strategy - resulting from a shared global vision;
- Image - projection of organization's internal cohesion.

This study also revealed that a high level of organizational integration is the main element for an organization achieves Excellency. Such organizations have proper mechanisms of planning, coordination and control activities and processes oriented to common objectives, as well.

3.2 Organization model

Based on all of these previous analyses, we move to the development of a simple integrated management model, which is presented in Fig.4.

Thinking simple, we will align productive activities in mission functional area and, at same time, we integrate all non-productive functions in support area.

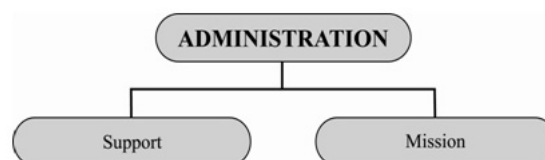


Fig. 4. Simple organizational model

To do so, we need to analyse the functions that an organization requests in accordance with Deming management principles^[11] and subsequently group activities by processes resulting on:

- Planning - administration functions beginning on vision statement, mission clarifying and definition of the strategy, organizational structure, responsibilities and actions;
- Resources - humans, materials, financials, knowledge, communication, facilities and maintenance;

- Provide - organization's mission accomplishment beginning on product or service design until delivery;
- Improvement - quality, environment and safety improvement activities and management review as well.

Regarding the integrated management basic model and Logistics elements showed respectively in Figs.2 and 4, we reach our Strategic Logistics model (see Fig.5).

In this Strategic Logistics model, we merged training and knowledge in a single area, assuming that knowledge includes training. In this line of thinking, transport and maintenance are included in facilities, as well as, communication encompasses information and communication systems.

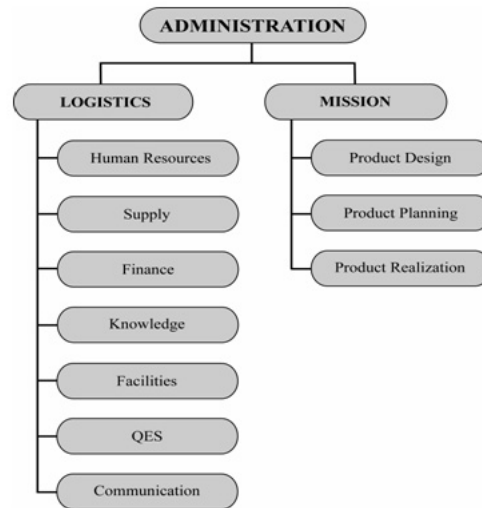


Fig. 5. Strategic logistics organizational model

3.3 Strategic logistics implementation guidelines

In order to implement this organizational Strategic Logistics model according to Lean Thinking perspective and methodology it is crucial to be prepared to natural barriers living inside organizations. Traditional practices, organizational structure, information systems, level of knowledge, among other aspects, have to be changed and restructured to assure the effectiveness of this organizational structure.

Right at the beginning, we have to make responsibilities clear and simple, or in other words, to provide the adequate leadership of organization main processes at different authority levels. Therefore, for the established functions and organization's processes, the following responsibilities have been defined, as showed in Tab.1.

To obtain the desired cooperation among different organization functions, we need to fight for a transversal culture crossing functional areas, which means process approach. Management by processes requires a global vision of the Organization in a way that allows desired empowerment, granting proper space for specialization, assuring necessary integration, easing processes interaction and controlling the achievement of expected results. In the road to implement our model some important tools have to be put in place:

- Business Process Management (BPM) - to identify and to structure processes having in mind their specific aspects and our strategy^[2].
- Analytic Hierarchy Process (AHP) - to establish specific weights for each process in order to determine relevancy and system's performance^[24].
- Activity Based Cost and Management (ABCM) - to make an economic comparison between the company's structure, processes and resources before and after the implementation of our model^[7].

As we have shown before, integration is, essentially, cooperation between different functional areas. However, common present management increases specialization and competition when rewarding better performances, becoming difficult to achieve integration. Therefore, in order to reach the desired level of integra-

tion we have to^[5]:

- Define a integrated management policy;
- Review, and probably change, organizational structure;
- Act on organizational culture;
- Develop a process approach and clarify process interactions;
- Reward by process and not by area or single activity.

Table 1. Hresponsibilities matrix

Process/Function	Administration	Logistics	Mission
Planning	Leading	Develop	Collaborate
Resources	Eases	Supply	Optimize
Provide	Observe	Support	Execute
Improvement	Review	Re-plan	Integrate

4 Results

In order to validate our methodology we first conceive a pilot project to implement this organizational model in a group of small enterprises. In this group, concepts of core business and integration are well developed, so the environment was not aggressive against this new perspective. In addition, all the organizations are Quality, Environment and Safety certified, process approach it is in practice, which made our model implementation much easier.

Aligned with Lean fundamentals, re-structuring organization and its processes in a simple way is allowing the achievement of some real advantages such:

- Less people on supporting or non-productive activities;
- Focus on organization's core strengths;
- Change fixed to variable costs;
- Increase flexibility and service level;
- Increase results and customer satisfaction;

After this first test, a plan to implement our model at a Technological Park, with about 80 organizations, has been drawn and its implementation has already begun.

5 Discussion

Organization Management is a very wide domain where research and development have to be really increased. As it is been stated, innovation in Logistics does not come without a purpose; it is required on a search for a higher competitiveness^[22]. We really believe that investing in research and development applied to Organization management will take us to a higher level of effectiveness and efficiency, thus competitiveness. To reach perfection, aligned with Lean Thinking principles, we really have a lot to innovate.

Nevertheless, the proper and capable implementation of Lean Thinking is expected to reduce and to eliminate non-valuing activities, and to increase productivity and competitiveness^[15] as well. To attain that and if additional supporting resources will become necessary, outsourcing should be the approach to consider. Keeping our organization Lean means less resources but proper resources, otherwise constraints will arise.

As Robert Martichenko^[17] recently stated it's time to go down to the basics; it's time to manage fundamental business processes otherwise this global fighting that companies are struggling today will be definitely lost.

6 Conclusions

The main conclusions we may withdraw from this work, based on presented information, are:

- Nowadays competitiveness requires organizations to have a sustainable capacity capable to allow the achievement of higher levels of efficiency and flexibility;
- Logistics, a very wide domain, really evolved through time integrating information systems, quality, environment and safety functions, because organizational dynamic and needs. An integrated and Strategic Logistics is required to allow obtaining a Lean Management;
- This way to Strategic Logistics according Lean Thinking, necessarily goes by integrating organizational structure and implementing a process approach, aligned with present management principles;
- Implementing and developing a Lean culture inside an organization is a complex and delayed process, which requires significant changes in its structure and way of thinking.
- Strategic Logistics provides an adequate framework, which leads organization to concentrate in its Mission, becoming lean and, hence, in a good position to reach higher competitiveness;
- To attain success implementing Strategic Logistics requires being prepared to change management approach, organization culture and structure and to eliminate barriers among functional areas.

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