

SCOR MODEL AND THE BALANCED SCORECARD, A POWERFUL COMBINATION FOR BUSINESS MANAGEMENT ASSETS

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ABSTRACT

The success of any organization depends increasingly on business processes that are aligned with its strategic direction and enable proactive change management. In this sense it has a logistics management role in an efficient, timely, and relevant throughout its value chain. Most organizations are lack of practical tools that allow them the identification and management of logistics processes in relation to their impact on customer expectations and strategic objectives of the organization. In line with this, in this paper we propose a procedure based on the Supply Chain Operations Reference model (SCOR) for linking business objectives with the operations of the logistics process and develop a systematic approach to identify, monitor and improve, their performance from the perspective of the firm as a link in the supply chain. Their integration with the Balanced Scorecard tool is a powerful intangible combination that enables comprehensive management and continual improvement by integrating the three levels of management and facilitating the decision making process efficiently and proactively.

KEYWORDS: Strategic Objectives; SCOR Model; Balanced Scorecard; Process.

INTRODUCTION

The constant searches and applications of new and more efficient management techniques and practices of planning and performance measurement of the organization have been a result of visible transformation of business world that, over recent decades, has exposed the urgent need for change and improvement in operating results, as the same financial system of the organization.

According to Montoya (2011) such techniques or tools must commit the characterization of the strategy to be followed in order to achieve high performance, as well as the possible expression of such strategies into specific objectives that are measurable by performance indicators from the organization or business.

Thus, in the current company there is increasing importance to management control. Resources are scarce, processes are complex, and the information that is required for proper decision making is becoming more critical. So, tools to support enterprise management and decision-making, are essential.

Organizations continually face new challenges, requiring radical changes in its structure, strategy and how to do things in order to present to the market a product of excellent quality, efficient service that manages to satisfy the expectations and customer demands; and for this the design and planning of the supply chain is of vital importance, as well as to achieve other goals set by the company.

Many supply chains lack adequate performance due to, among other things, lack of integration, coordination and rationality in their processes, lack of logistics management techniques to facilitate the design and management, obviating necessary integrations between its elements, and that is it has not defined the proper deployment of the strategic objectives of the organization through the processes in the supply chain, so it is an unknown contribution to the strategic direction of the entity and makes the analysis and control of compliance with these objectives and decision making. It also generates a lot of information in the form of indicators and sometimes it is irrelevant without adequate consistency with the objectives of the key processes, causing loss of time and unnecessary effort reflected then in raising their costs and the service provided (Diaz, 2009).

Measurement is critical to know quantitatively the behavior of the supply chain. Lambert, E. et. al (2001) recognize that a critical point in the evaluation of the performance of a company and its supply chain is the choice of the most appropriate indicators for each case as of its analysis detected feasible areas for improvement that will enable them to competitive success, however there are still few researchers who have focused their efforts on developing measurement of supply chain systems (Gunasekaran, A. et. al., 2001; Lambert, E. et. al., 2001; Edsom, Ch. and Voltolini, E., 2004) and in the practice entrepreneurs not allocated yet sufficient resources to accommodate the integration of indicators of supply chain as a support for decision making to achieve the success of the business strategy.

In this sense, the aim of this paper is to develop a method for improving the supply chain management control system to enable the proper deployment of the strategic direction of the organization and making effective and timely decisions.

It should be noted that the procedure used as fundamental tools the SCOR and the Balanced Scorecard model, a tool for management control widespread in recent years and the numerous successful results in its implementation.

To complete the objective we based these tools and the procedure proposed, explaining its nature, philosophy, tools and methods to be used in each of the component steps.

DEVELOPMENT

SCOR Model

According to Arana et al. (2011) a proper management of the supply chain can help member companies to improve the competitiveness of it, in terms of greater efficiency in the use of resources that facilitate the achievement of the objectives of end customer service, greater precision in planning and controlling the flow of materials and information from the supplier to the end user, improved relationships between members of the chain, reduce inventory levels and delivery time, etc.. A growing number of researcher have dealt with this phenomenon, studying the positive effect that a proper management of the supply chain has on business performance (as noted by Arana et. al., 2011; after consult with Power, Sohal and Rahman, 2001; Rosenzweig, Roth and Dean, 2003; Bagchi, Ha, Skjoett-Larsen, and Soerensen, 2005, Li, Yang, Sun and Sohal, 2009; Flynn, Huo and Zhao, 2010).

In this sense the SCOR model provides a unique framework that links business processes, management indicators, best practices and technologies in a unified structure to support communication between partners in the supply chain and improve the effectiveness of management and supply chain improvement activities (Díaz, 2009).

The SCOR model has been able to provide a basis for improving the supply chain in global projects as well as specific local projects.

It should be noted that this model allows to describe the business activities needed to meet customer demand, it is organized around five major management processes: Planning, Procurement, Manufacturing, Distribution and Return, and contains three levels of Process detail: High level (Process Types), Configuration Level (categories Processes) and

Process Elements Level (Decomposition Process).

“The SCOR model is focused on the first three levels and does not attempt to prescribe how each particular organization should conduct its business or design their systems and information flows. Each organization implementing improvements in their supply chain using the SCOR model will need to extend the model, at least to level four” [Calderón, J.L. and Lario, F.C., 2005, p. 4]⁽¹⁾

Stadtler meanwhile, et al. (2005) argues that SCOR is a reference model, does not have a mathematical or heuristic method, however it standardizes terminology and processes of a supply chain modeling and, using KPI's (Key Performance Indicators), compares and analyzes different alternatives and strategies of the entities of the supply chain and the entire chain.

Therefore, to determine the contribution that each of the processes that make up the supply chain and thus detect enhancement feasible areas that give them competitive success indicators that need to quantify their performance, so it is necessary the assessment of their conjugation with other business management tools that facilitate decision making by indicators in a balanced and proactive way, as in the case of the Balanced Scorecard.

Balanced Scorecard considerations

The Balanced Scorecard (BSC) is a method of collecting and classifying information generated by management control systems. It develops from the base to the higher management levels providing a global direction of the company with the aim to facilitate decision making in order to carry out the proper management of the same. It also serves as a channel of communication between the different levels of the company, whether horizontal or vertical, and reports the progress of the strategy and business objectives.

Several authors (Aparisi, J.A. and Ripoll, F., 1999; Horváth and Partners, 2000; Nogueira, D. 2002, Machado, N. 2003, Kaplan and Norton, 2009) agree in one way or another that the Balanced Scorecard is a tool that closely intertwines the strategy and mission of an organization with a series of measures to be carried out by measuring the performance company from four perspectives balanced: finance, customers, internal processes, and the formation and growth perspective. For all this it provides an overview of the organization, greatly facilitating decision making, being a primary tool in the activity of running a business.

In this sense Scaramussa states:

“The main objective of the BSC is in the relationship of strategic planning to operational activities of the company by means of the following: clarify and translate

vision and strategy, communicating and associated strategic objectives and actions, planning, setting goals and ordering strategic initiatives enhance strategic feedback and learning [Scaramussa, S. et al., 2010, p. 6]⁽²⁾

So, besides informing, the BSC helps to formulate and communicate strategy, align the objectives of the organization and employees, train and motivate employees, improve continuously and finally, redesign the strategy.

According to Montoya (2011) with the BSC organization will be forced to make a redefinition of its standards in this regard that can meet the needs of customers, as it supplies management system that a gap exists in most management systems by the absence of a systemic process to implement and thus establish a process of communication or feedback on the same strategy.

The same author states that among the many purposes of the BSC is to detect all the deficiencies that management is carried out or those aspects that are being managed and which undoubtedly require reinforcement.

In the words of Scaramussa et al. (2010), the BSC is a comprehensive management system that enables integration of aspects of strategic direction, as the same performance evaluation that has been in business. Also, he suggests that one of the major contributions of BSC is to enable the translation of strategy into objectives, measures and initiatives, easily understood by the participants of the organization.

With respect to the above, Alveiro Cesar Montoya holds that:

“In general it can be said that the Balanced Scorecard is a tool that provides a framework to translate strategy into operational terms and likewise serves as a communication at all organizational levels. Similarly, can be seen lounging as a support for strategic change and to establish the foundations for organized administrative actions and processes rather than functions” [Montoya, C.A., 2011, p. 14]⁽³⁾

Peace (2007) says that, such process analysis activity should be reinforced and communicated the objectives and indicators that are raised, keeping in mind that you must make a greater focus on renewal permanent attitudes and in improving processes.

For Scaramussa (2010) identification of critical processes through the decade of the value chain allows the selection of performance indicators that best measure critical processes.

The foregoing is based with what Montoya Alveiro says:

“On the other hand, it can be established that the indicators defined can be modified whenever it is considered appropriate because sometimes analyzing the results to identify the needs, to modify, replace or add different indicators, in order to achieve a

more convenient analysis to management's teams" [Montoya, C.A., 2011, p. 21]⁽⁴⁾

"Finally, it is established that the Balanced Scorecard is a management system that requires the commitment and participation of all servers to achieve success and the expected benefits to the organization " [Montoya, C.A., 2011, p. 21]⁽⁵⁾.

In this way the authors of this study agree with the following approach:

"A process of training and strategic feedback based on the balanced scorecard has three essential ingredients:

1. A shared strategic framework or structure that communicates the strategy and allows participants to see how their individual activities contribute to the achievement of the overall strategy.
2. A feedback process that collects performance data regarding the strategy and allows the testing of hypotheses about the interrelationships between objectives and strategic initiatives, and
3. A team problem solving process that analyzes and learns from performance data and adopts the strategy to emerging issues and conditions "[in Montoya, C.A., 2011, p. 6]⁽⁶⁾

From the foregoing, one can derive the benefits of the BSC and how this tool connects the company's strategic direction to the management of its processes. This analysis shows that the BSC has a common point with the SCOR model processes analysis, the first through the internal process perspective and the second because its philosophy is to improve the supply chain through its component processes, constituting a powerful combination that can be valued intangible structured manner through a procedure to facilitate the process of decision making and continuous improvement of logistics processes in correspondence with the mission and business strategies.

Basis of the procedure

The proposed procedure as shown in Figure 1, allows identification and analysis of logistics processes based on SCOR model contributions from its core management processes and key indicators and attributes, seen from the company perspective as a link in the supply chain and management of logistics seen as macro-process and as part of the supply chain that plans, conducts and controls the flow and efficient storage and effective flow and services as well as related information.

Stage 1: Detailed description of the studied object

Stage 2: Identification and classification of the processes

Stage 3: Categorization of the processes

Stage 4: Establish the detail level of the processes

Stage 5: Precision of the key indicators and their attributes

Stage 6: Implementation of the results

Stage 7: Follow up, control and improvement

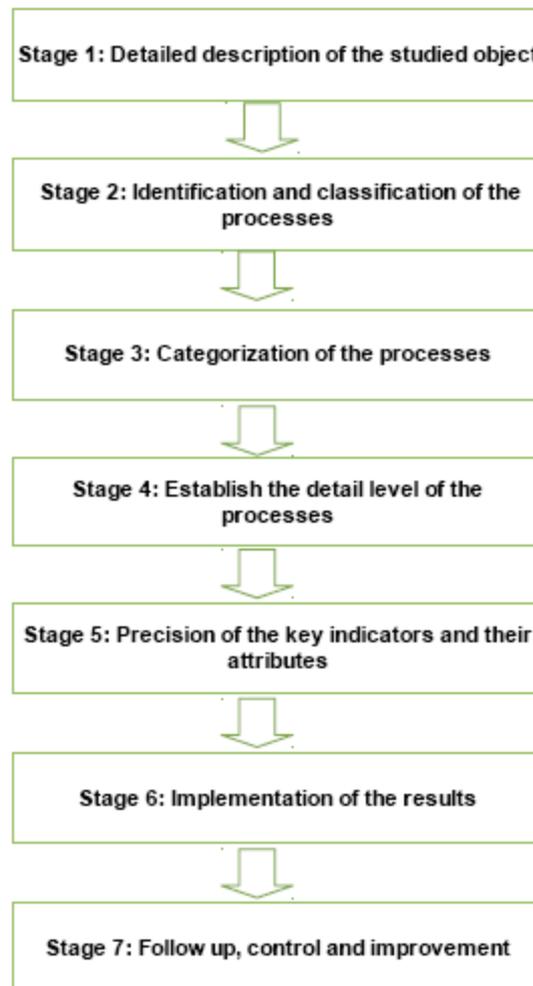


Figure 1. Process for improving the control system supply chain management
Source: Own Elaboration

For the development of any project first it is necessary to prepare the foundation for carrying out its realization. For lasting success, it is necessary to gain acceptance through intensive communication and interactive ways. Communication measures should encourage the belief highlighting the need and importance of the project.

In this first stage it also proposes the creation of an interdisciplinary team that will be responsible for implementing the procedure. Most of the team members must be members of the board of management of the organization and specialists of the different areas of the

supply chain, with knowledge in management systems and supply chain tools.

Then it should be designed to use resources, human, material and financial resources for the development of the project and responsible for each stage or activity. Below are each of its stages.

Stage 1: Detailed description of the subject under study

To facilitate work in the later stages it is necessary for a detailed characterization of the logistics system to be analyzed, for it can be considered elements as major suppliers and customers, component activities, information flows, financial and materials as well as existing services which will ultimately achieve customer satisfaction. The tools you intend to use for performing this step are flow charts of activities and thread, and the Model of Organization (MGO) for the formation of flows and their integration.

Step 2: Identification and classification of processes

It is necessary to identify and analyze the processes associated with the value under study, as well as its relationship with key success factors. The focus will be on the key processes to be selected in correspondence with its impact on customer expectations, strategic objectives and the possibility of short-term improvement.

According to Miguel Angel Mallar:

“to establish a rigorous design of each process, the yield increases because resources are not wasted no time in futile efforts. Process management also provides benefits by aligning to achieve a common goal-oriented client, providing a framework for job redesign (reengineering)” [Mallar, M.A., 2010, p. 19]⁽⁷⁾

This stage is based on the first level of the SCOR model. In it the processes described in the previous stage are arranged or grouped by main management processes: planning, procurement, production, distribution and return. In this sense they behave as part of the logistics process is analyzed in the framework of the company or you could call them internal processes. The description of the outline of each of these basic processes are then performed.

- **Planning:** In this area we analyze how to balance resources with requirements and establish and publicize plans for the whole process. Moreover we study the overall performance of the company and look at how to align the strategic plan with the financial plan process.
- **Provisioning:** Within this area we analyze how to program delivery, identification, vendor

selection and evaluation of suppliers or inventory management.

- Production: Corresponds to the field study of scheduling production activities, the characteristics of the product, the testing phase or preparation of the product for their passage to the next stage of the supply chain. Also, in the event that it is applicable, it provides for the completion of engineering issues.
- Distribution: Within this area we analyze all the related management processes client requests and shipments, warehouse management, receiving and checking the product on the client and its installation if needed and finally to billing a client.
- Return: The processes associated with the return of the product and customer service post handing over are analyzed within the scope of the model.

According to Montoya (2011) review of a value chain should raise the possibility of a redesign and innovation in all processes and activities thereof, latent opportunities using those as continuous improvement or process reengineering, with the firm intention to meet customer expectations, improve the cost and efficiency of the processes as well as make appropriate use of the assets.

Stage 3: Categorization of the processes

In accordance with level two of the SCOR Model in this way large groups are subdivided into categories Processes, which are: four to Planning (P), three to Provisioning (A), four distribution (D), six to Return (R) (three of Provisioning and three Distribution), and five to Support (S).

The three categories in which Procurement and Distribution are subdivided are: from stock (A1 and D1), request (A2 and D2) and design-order (A3 and D3), but distribution has a fourth category it is Retail Product (D4).

Return in turn has three categories: Defective Product (RA1 and RD1), Product for General Maintenance and Repair (RA2 and RD2), and Product in excess (RA3 and RD3).

The first four are planning type, the intermediate 13 are execution type and the last five are a kind of support which give support to the Planning and Implementation: prepare, preserve and control the flow of information and the relationships between the other processes. The processes and categories can be represented by thread diagrams. The threads of the logistics process can be developed from physical-geographical flow of products. An illustrative example is shown in Figure 2.

Step 4: Set the level of detail of the processes

At this stage it should represent processes in more detail. This is achieved by breaking down the categories set out in the previous step in Process Elements. These elements are presented in a logical sequence (with rectangles and arrows) with inputs and outputs of information and material as shown in Figure 3.

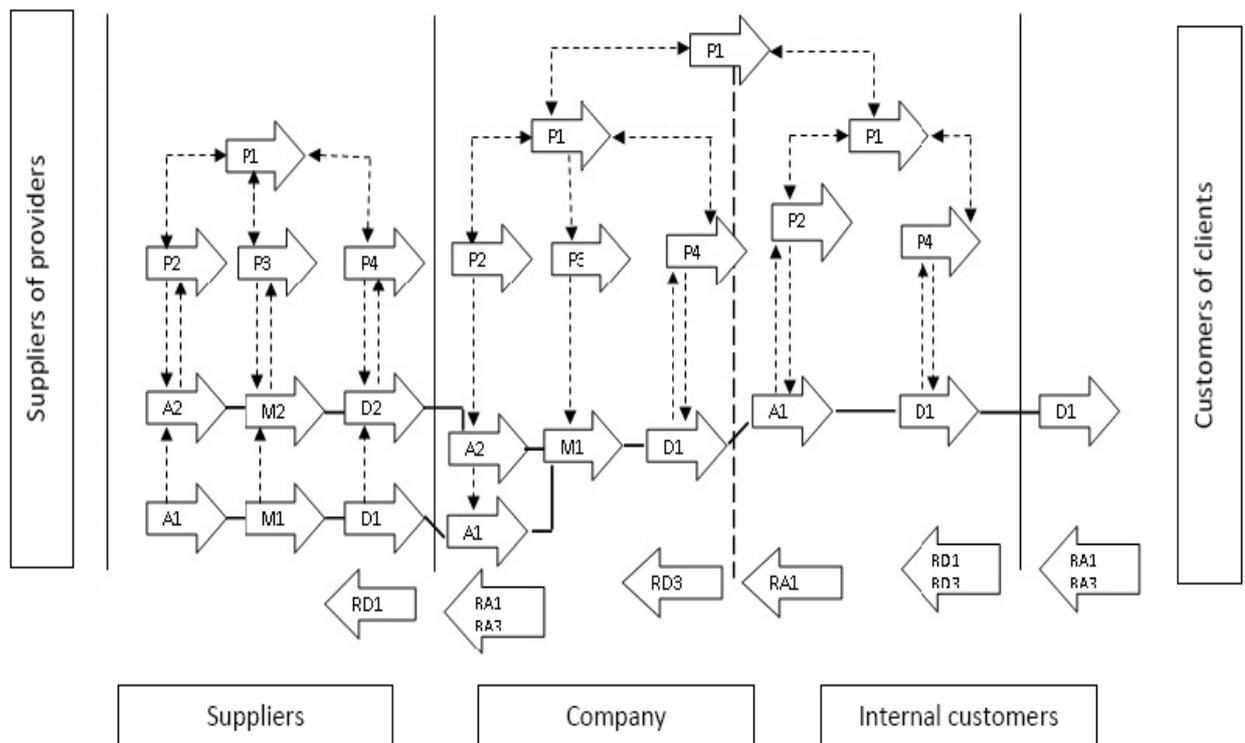


Figure 2. Thread diagram example
 Source: Compiled from Calderon, JL & Lario, FC (2005)

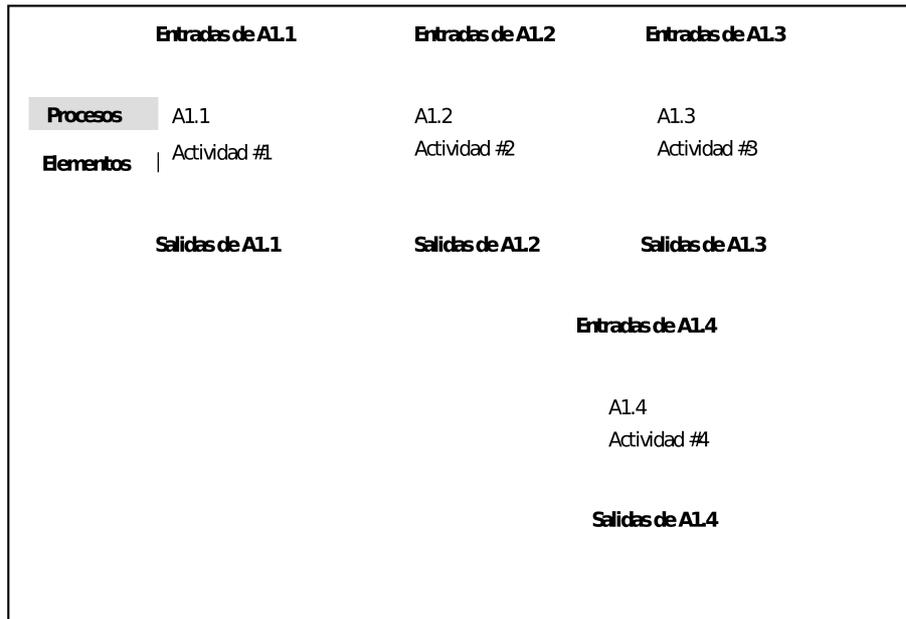


Figure 3. Example decomposition process graphic elements A1
Source: Compiled from Calderon, JL & Lario, FC (2005)

At this stage you should improve Operations Strategy, and identify best practices applicable for each defined element and system capabilities (hardware and software) required to support these practices. In addition to align performance between process steps to achieve the performance targets.

Stage 5: Accuracy of key indicators and their attributes

This stage requires a working group with experts to assess which activities and processes are taxed at certain indicator in relation to the strategic objectives of the organization in the period. You should measure the performance of each process and element by index or key performance metrics (KPI's) so as to assess the contribution of the process to fulfill the strategy. These indices are those that the teams with help from the experts determine what can better be measured the process in question. So, in this way there are the performance differences between the processes and elements, and identify best practices while taking into account the principles and philosophy of supply chain management and particularly the SCOR model.

Stage 6: Implementation of the results

For the implementation of the results as outputs of previous stages of the procedure first one must establish a training program for involved staff in the implementation process, which should eliminate any resistance to change that may exist and also define the responsible of each of the tasks to be executed.

It also must establish how and how often calculate KPI's and introduced the working methods and procedures relating to the design of the previous stages.

Also, as premises for its implementation, it requires the support and commitment of the team of experts selected, in addition to all personnel involved in the changes. Commitment levels should be established between the parties involved in the integration of the supply chain as are concatenated and the successful completion of one depends on the previous one.

The maintenance and development of the alliance with the members of the chain depends on actions and approaches undertaken in the organization and collaboration among them. Some of these forms of cooperation include: joint development of plans, programs and improvements joint development, synthetic consultations on matters of business, joint formulation of market strategies, joint investments in assets, joint studies of demand and sharing of research results, exchange between managers, workers and specialists, organization of joint services, joint management of risks and benefits, among others.

Step 7: Monitoring, control and improvement

This stage is the one that will ensure continuous improvement and sustainability of the system obtained. The control function is the measurement of progress and its comparison with the expected result that, if different, take necessary actions for improvement.

The SCOR model does not cover but assumes the existence of human resources activities, training, systems, management, risk management and quality assurance, among others, issues that limit the model and for which the authors of this study propose their integration through the Balanced Scorecard in order to ensure the appropriate conjugation of these elements to the successful achievement of strategic objectives.

This tool is a comprehensive planning system with a high profile evaluation monitoring indicators facilitates sampling all relevant information of each of the processes in a small space facilitating decision making process in a comprehensive, relevant and timely.

The objective of using the Balanced Scorecard in the management of the supply

chain allows for four relationships based on classical perspectives proposed by Kaplan and Norton:

- The goals of logistics management can be analyzed through the perspective of internal processes. Here we combine the processes and elements described in the detail of the processes to achieve the goals of level indicators proposed logistics customer service.
- Questions of cost reduction in relation to the behavior of inventory turnover, idle resources, waste and deterioration, storage costs, purchasing, among others, can be evaluated through the financial perspective.
- The results of the evaluations of customer satisfaction and the fulfillment of the strategies for these purposes can be analyzed through the perspective of customers.
- By learning and growth perspective one can analyze the process management strategy, all related to structural capital and related training to the outputs of the application of the proposed method steps and information systems and technology needed for support.

This process includes the analysis of the differences that exist between the actual result with the pattern set with desired value. These analyzes should be presented in a clear and may be by means of tables and / or graphs, favoring clear appreciation of the changes occurred. It will be necessary to standardize the improvements to avoid setbacks, this is essential to ensure progress and sustained continuous improvement.

In case of any variation in the previous step we analyze the possible causes that gave rise or occur, by analyzing inhibitory factors (need, power and act) (Pérez, 2005).

After identifying the objects passed to improve the projection of improvement opportunities, which conducted an overall analysis of its feasibility (economic, ecological, social, legal, political, etc.) to avoid violations and / or economic loss.

The improvement actions should be scheduled and deployed over a time horizon which can range from short to long term. In any case, and for effective implementation of these, you must define previous, as in the implementation stage, and appropriate priority sequence of implementation, the estimated budget, the tentative dates of commencement and termination, resource requirements as well as those responsible for its implementation.

It is crucial to conduct regular surveillance of the evolution and / or trends of the requirements and expectations of customers as well as emerging technologies and / or available to thereby translate these findings into new service specifications. These changes may affect the way to evaluate future performance of the system as well as in the selection of improvement strategies, just as in the training of staff to adapt to changes as they happen.

Results of application of the proposed method

The procedure proposed for improving the control system of supply chain management has been applied in two companies in the province of Villa Clara: Telecommunications Company (Diaz, 2009) and Fuel Trading Company (Diaz, A. et. al., 2011) with satisfactory results both for the acceptance of management and human capital involved and the level of organization achieved, resulting in improvements in performance indicators and customer service as a result of design. Below is a summary of the results of the application of the methodological tool outlined in the Telecommunications Company.

In accordance with the provisions in step 1 one first proceeded to the detailed description of the subject matter that constitutes the logistics of the Territorial ETECSA in Villa Clara (DTVC), as a management process within the company supply chains. As a result of this step there was formed a logistics network, which also identified the interrelations of its components through the current process flows (material, information and financial). Figure 4 shows the representation of information flow.

After the performance of the flows were integrated, which facilitated the identification and classification of processes considering the structure proposed by the SCOR model, the object of study was composed of processes: planning, procurement, distribution and return. For each process there was defined the activities that make up and establish levels of detail in each case by thread diagrams and described categories. Figure 5 shows the level of detail on demand provisioning category (A2), which is decomposed into process elements (activities), inputs and outputs.

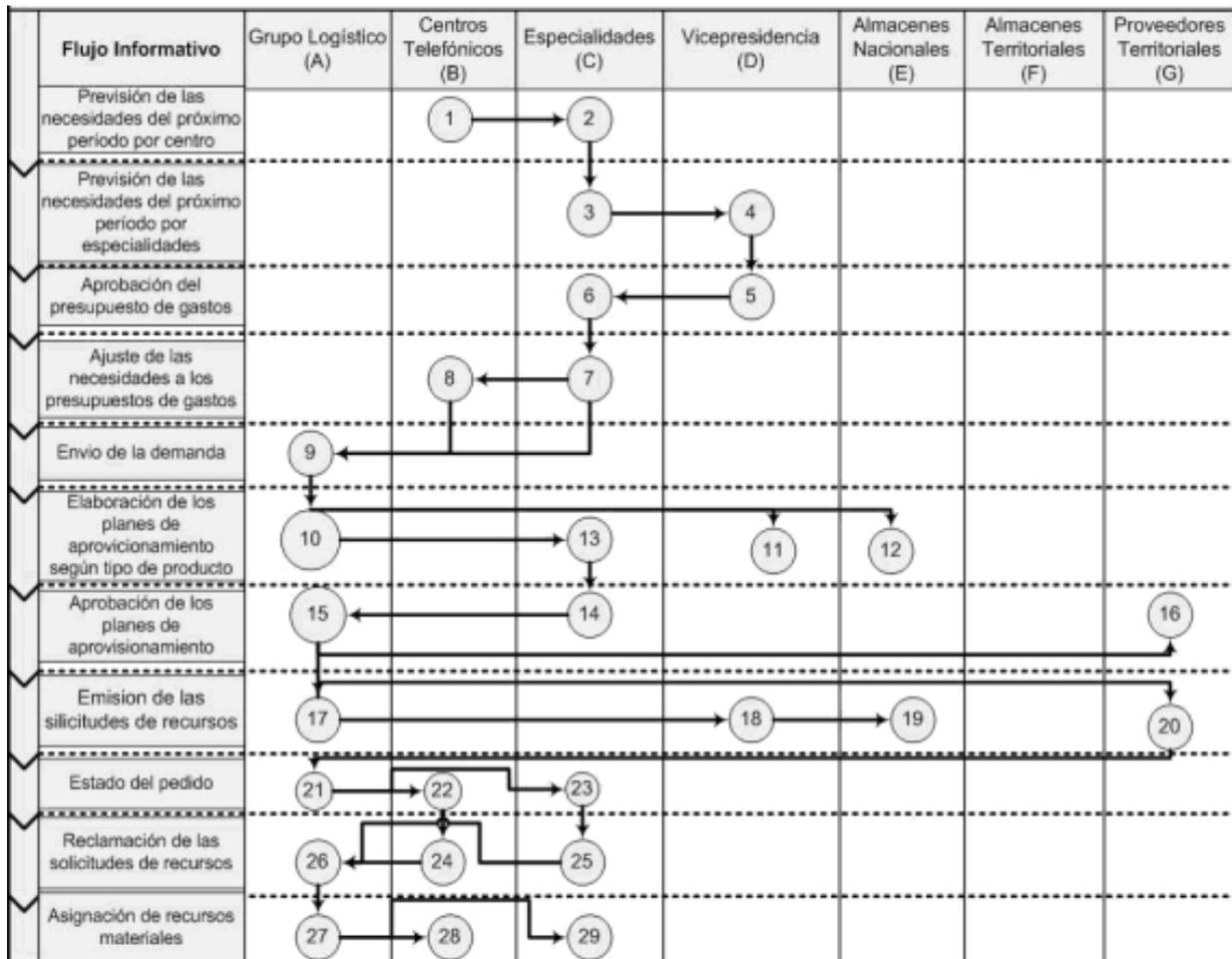


Figure 4: Representation of information flow logistics process of the Territorial Directorate of ETECSA Villa Clara

Source: Own Elaboration

To evaluate the performance of each process and element corresponding to step 5 metrics were defined and described the inputs and outputs of each of the elements.

KPI's were defined of the processes in line with the strategic objectives of the period and constitute the core of the Balanced Scorecard. They prepared a manual which established indicators in each case: calculation, source, responsible, frequency measurement, process and objective (s) associated.

As a result of implementing the proposed design and work procedures developed it has shown improvements in most indicators evaluated results which demonstrate the feasibility and relevance of the proposed tool and the incentive for continuous improvement. Table 1 shows the indicators related to the first strategic objective perspective of customers, which are in correspondence with the processes and key components of the service that

most interests internal customers of the company.

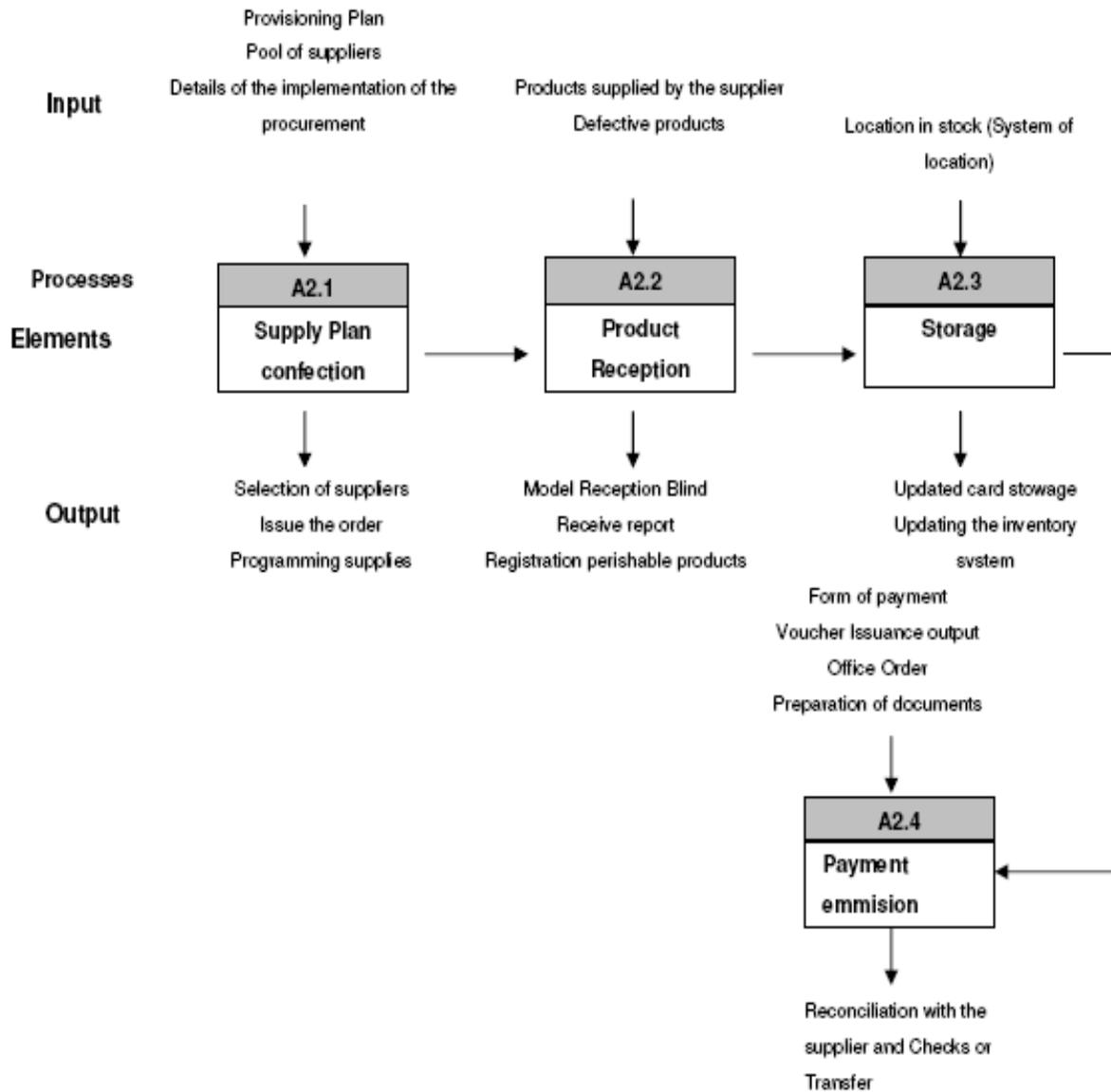


Figure 5: Level of detail of procurement process
Source: Own Elaboration

Table 1: Model for the evaluation of the indicators that compose the Scorecard

No	Strategic Goal	Perspective	Indicator	UM	Desired Value 2012	Real Value 2012	Desired Value 2013
1	Increase satisfaction of internal customers	Clients	Weighted overall quality level (NCPG)	Points	Higher than 0,70	0,81	Higher than 0,85
			Delivery time (TE)	Days	12	12	11
			Complete delivery by range (ECs)	%	85	84,11	85
			Flexibility (Flex)	%	85	88	89
			Product quality (CP)	%	Higher than 95	98	100

Source: Taken from the information system of the company

CONCLUSION

The proposed procedure allows the correct identification and definition of logistics processes, contributing to the alignment of the areas and processes with the strategy of the organization and analysis of the achievement and fulfillment of strategic objectives through efficient information, relevant and timely.

It measures the performance level of the logistics process and analyzes to what extent the process fulfills the mission and objectives in relation to design and management in line with company strategy and philosophy of the SCOR model, combining level-related criteria customer service, costs and assets.

Integration with the Balanced Scorecard tool allows to cover all processes and activities that make the logistics process indicators (KPI's) appropriate, facilitating decision-making and continuous improvement of the system for the successful achievement of the strategy of the organization.

Finally it should be noted that the proposed procedure is feasible for all types of business organization and involves no additional cost, for what it is to exploit the media, human and material resources it has and one can implement the logistics system in a more efficient manner. So it is a tool to exploit reserves of productivity and savings (reduced inventory costs, order-delivery time and billing cycles, better resource planning, responsiveness, etc.) to make more effective decisions, decisions in less time and thus can provide a better service to customers in higher income eventually reverses and sustainability

of the system.

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BIOGRAPHICAL ABSTRACT

Please refer to articles Spanish Biographical abstract.