

EUROPEAN FOUNDATION FOR QUALITY SYSTEM NEW MANAGEMENT MODEL ADOPTION

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Abstract

This article aims to study and prove the adoption of a new Management Model, in a process of organizational transformation and in the case in particular through changes in the shareholder body, the change of generation and especially by the inclusion of the professional management team, in consequence of the key performance indicators improvement, including the EFQM score as an all.

Keywords: Organizational Change; Organizational culture; Leadership; LEAN management; Application Model.

Introduction

In our introduction we will base the analyses of the macro message of the Portuguese minister of foreign affairs (Santos, 2020):

Pandemic showed need for reindustrialization of Europe

The economic crisis provoked by the response to the Covid-19 pandemic forced “to learn some lessons that could be an opportunity for Portugal and Europe”, said the Minister of State and Foreign Affairs, Augusto Santos Silva, at a hearing of the Economy commission, Innovation, Public Works and Housing of the Parliament.

One of the lessons is that the European economy needs to have industries that went to other continents again, and this reindustrialization could be an opportunity for Portugal, said the Minister, who is responsible for the internationalization of the Portuguese economy.

The case study was performed in a Portuguese industrial company founded in 1920, remaining its shareholder body over time and to this day within the same family. It is today and since 2014, managed by the third and fourth generation, assisted by a group of professional managers, one of whom is a member of the Board of Directors together with the family elements (Speitzer and Quinn, 2001). The initial idea of the intervention was prepared for the advanced change in the models and management systems, until then supported in the logics and principles of "Mass Production" (Womack, Jones, and Ross, 2010), for the philosophy of "Lean Production" with all the significant impacts of organizational transformation (Quinn, 2006; and Ledbetter, 2018). The work goes through several phases, which analyse the principles of strategic management, definition of objectives and effective implementation of strategies (Grant, 2016). The initial change would always have to be supported in fundamental pillars of action, in which we highlight the clear definitions of the Purpose, the study of Processes of greater preponderance in the management of the company and the clear involvement of people at all hierarchical levels fostering learning (Shook, 2010; and Burkett, 2016).

The great challenge would always be the coexistence of the experience and history of the company with the application of modern and current management techniques and tools, considering the strength of the name and not the brand of the organization, as the aim is to test the model on an Portuguese traditional industrial company, with 180 employees in the start of the new wave of industrial activity, moving to 300 employees, regarding the new approach and growth in the business as a consequence.

As the company operates on the metalworking transformation for agricultural, transport and spare parts markets, so it on crucial importance a real industry approach and at the same time a modern management model.

For the development of the company's fundamental organizational pillars, strategic base axes were created, which allowed to elaborate the action plans that support the capacity to implement the basic ideas of each of them (Papanikos, 2010).

As a way of developing the defined, negotiated and approved strategic axes, we are monitoring its evolution through the EFQM (European Foundation for Quality Management) model, which also allows us to dilute the accentuated hierarchical effects to a more flexible and collaborative culture (Lopes, 2016), thus enabling leadership based on competencies and relationships in order to a networked culture.

The basic idea understood would always be the demonstration capacity that the management culture in Portugal, or of the Portuguese managers, is in line with the application of own models of management of the organizations, supported in systems developed in a holistic way and that lead the performance in its several strands or pillars.

Methodology Change and Organizational Development Project

The so-called "Project for Change and Organizational Development" (Kotter, 2008) was the model chosen by top management to ensure the necessary change process, as well as compliance with the business plan, supported on the European Foundation for Quality Management, where the different phases and tools applied are evaluated by the full model score, that reflect the management processes improvement in order to react to the new industrial challenge.

The model to be developed is supported by three fundamental pillars that allow its development in phases, considering the permanent monitoring and evolution: (i) Management System - Consolidation and Sustainability; (ii) Themes: Context, stakeholders, leadership and strategy; (iii) Lean Global Management Philosophy (Womack and Jones, 2010).

Management System - Consolidation and Sustainability (context)

We then describe the model from the generic point of view, showing the improvement actions chosen by the top management of the company, considering the connection of the functional areas to the points treated in the respective activity plans described (Flick, 2002).

In the concrete case study, top management conducted its priorities for action and follow-up in the same intervention logic, highlighting the actions in terms of direct intervention in (i) leadership training (passing to intermediate levels) (ii) policy definition (iii) redefinition and management of business processes (LEAN implementation works) (iv) performance indicators (follow-up and performance using the Scorecard).

Phased implementation

The project was defined in six phases for its implementation in which the basic idea was the management of an implementation process, considering the fundamental aspects of experimentation, communication, diffusion and adoption of best practices. In this way the following sequential and evolutionary phases were evidenced, as we described: (i) Definition of Macro Project with executive management - present, explain and discuss the model in November 2019; (ii). Communicate to the middle managers - present and explain to all heads of the areas and philosophy and objectives to start the process in January 2020; (iii) Pilot areas - jointly define the initial area or areas of intervention and implement in January 2020 (note: integrating comments and opportunities for improvement of external audits of quality and customer certification); (iv) Results Evaluation - implement the procedure in the pilot area (s) and then evaluate results in March 2021; (v) Expand by organization - define the following areas and continue the process in order to achieve 80% implementation by November 2020, in April 2021; (vi) Continuity - continuous and permanent improvement should enter into the evolving organization's "lifestyles" in July 2021, at which point management and improvement cycles should be supported in the DMAIC / PDCA as complementary methodologies (Basu, 2011).

Improvement Cycles

Knowing that the decision on the methodology to be adopted falls on the DMAIC cycle, complemented by the PDCA cycle, it will be interesting to compare the two methodologies and these with the methodology of project management, often used in isolated project management, such as the improvement or the investment in a certain critical process at a given time (Nokes, 2007) and (Basu, 2011).

Thus, in [Table 1] we compare the three methodologies showing their complementarity:

Our choice of follow-up and use was clearly based on the DMAIC cycle, complemented by GP (where applicable) and PDCA (for timely improvement cycles), so we characterized it in detail in [Table 2 and table 3] (Basu, 2011).

[Table 1] [Table 2] [Table 3]

The description of each phase of the DMAIC improvement cycle, adopted in the present case study, should then be complemented and configured with the inclusion of the Lean management tools to be used in each of the phases, (Basu, 2011).

The use of the various phases of the DMAIC cycle, as well as of the respective tools, should always keep in mind the involvement of the people of the teams in the areas under analysis.

Follow-up Model

The Management Follow-up Model is the BSC - Balanced Scorecard (Kaplan and Norton, 2016), described and designed on the basis of strategic maps organized in four perspectives, namely: Financial Perspective; Customer Perspective; Perspectives on Internal Processes and Perspectives on Learning and Growth.

The philosophy used and recommended by Kaplan and Norton is the organization of the management indicators, by the four elements of the model, in [Table 4] we illustrate the specific case of our study:

[Table 4]

The report will always be presented in graphs against objectives, considering the historical evolution of each indicator, time and space for eventual comments and frequency of follow-up (Kaplan and Norton, 2016).

Evolution according to the Model (EFQM)

In the tables and graphs below, we can verify the score of each of the areas of the model, which has as maximum possible score 1.000 (thousand points), divided by the various areas according to their respective percentage weights, still within their two fundamental elements of means and results (Chart 1).

[Chart 1]

According to the table and with the appraisal applied to the executive management of the company the results were obtained in [Graph 1] (January 2019).

[Graph 1]

From reading the results obtained in early 2019, we observed the global value of 54%, representing 540 points in 1000.

In [Graph 2] we present the results, which we consider to be intermediate for the current management cycle, considering that the end of the observation would be the end of 2021.

[Graph 2]

We observed that 73% of the total value represented 730 points out of 1,000 and that the improvement was developed in all elements of evaluation, with particular emphasis on the evolution of leadership and processes, not being extraneous to the implementation of the Lean management philosophy (Shook, 2010 and 2018).

Risk management

In today's changing context, shareholders have been clamouring for greater transparency about the risk's organizations face. There is growing recognition that proactively coordinating all risks in an integrated way is critical to success, so traditional approaches to risk management are no longer sufficient (Kumar, 2021).

Risk Management Model

The risk management model was based on the following five areas considering the business risk control approach (Kendall, 1998): (i) Market Risk - Measured by sales results and margins against the budget, BCG Consulting Group) and Porter's five-force diagram in (Grant, 2016); (ii) Credit Risk - Considering the approval and policy of credit to be granted, insurance and obtaining credit from third parties and banking; (iii) Operational Risk - brand image and company reputation (NPS), product quality, project development, contingency plans and incident recovery (DRP); (iv) Legal risk - Management of Contracts, present and future litigation, compliance with commercial, labour and tax legislation; (v) Risk of Information and Communication Systems - Classification of information required in "confidential" and security of information and communication systems (Ross and Francis, 2003).

Interested parts - Reason for Existence and Value Creation

Value creation, in fact, is the essence of the existence of companies, was defined as the generation of results for customers and shareholders, based on an evolutionary diagram supported by several pillars and strategic actions that we described (Black, Wright and Davies, 2000): Define objectives in all areas of the company; Solve

problems - what problems? - it will be the work to be done; Work to be carried out through the intervention and through the business processes; Involving the teams and having the means available and finally we have to improve and evolve, as: (i) By increasing the knowledge and skills of our people; (ii). Improving attitudes, behaviours, leading by example, this is in fact the management system, including the meetings we hold to track the evolution of processes and objectives (Cameron, Quinn and DeGraff, 2006).

Performance Model and Objectives

In the concrete case study, the principles of action that support the Performance Model and Objectives were developed: (i) Managing People for improvement, adaptability and results; (ii). Increase performance levels through process practices; (iii). Practice and experiment to become more comfortable in the field of processes; (iv) to work with greater individual and collective effectiveness (Schuh, Lenders, Michael, Hieber and Solveigh, 2008).

LEAN transformation

The management of the change process that supports the Lean philosophy's implementation path from the behavioural point of view is based on its five-dimensional characterization and on a fundamental missus that is "not to speak in a vague way" (Shook, 2010). The dimensions of support to the process of change are: (i). What typology of problems we are here to solve; (ii) knowledge and skills of the people; (iii) Work to be performed permanently and follow-up model; (iv) Management and Behaviour System; (v) Ability to think every day to improve things (Shook, 2010).

How the LEAN System Works

The operation of the Lean System is directly related to the logic of creating value for clients and shareholders, in this perspective the behavioural dimension supported by strong leadership styles and guided by the example management and the development of long-term, internal partnerships and external (Shook, 2010).

The System is not in line with certain management situations, which it repudiates and avoids through good process practices, the main situations are related to late deliveries to clients and the maintenance of high levels of inventories, cause treasury limitations and maintain assets without utility (Womack and Jones, 2016).

In terms of management approach, financial indicators should not be the basis of the follow-up model, but rather the operational ones, making the former a natural consequence of the latter, reflected in the budget (Womack and Jones, 2016); (Basu, 2011).

Model LEAN - Company

In the Company case study the Lean management system was designed and conceived in four fundamental areas of basic performance, which are then developed according to the concepts or processes that support them, in [Table 5] we represent the conceptual model with the natural interconnection to the defined strategic plan and taking into account the four areas of action that we describe as: Definition of the Purpose of the actions; Involvement of People; Continuous Improvement Cycle (PDCA); List, description and transformation of all company processes, (Shook, 2010).

[Table 5]

After the representation and construction of the conceptual model we must implement the Lean - design model, which is the application of the concepts to the company's reality. We represent the scheme of the model in [Table 6].

[Table 6]

The application areas coincide with the conceptual model in terms of macro definition, we will then develop the model in practice and in numbers, [Table 7].

[Table 7]

The significant improvements in operational indicators are reflected in the company's economic and financial indicators, through reduction and optimization of costs, and also improve its competitiveness through the adjustment of the sales price strategy to the reality of the markets, greater agility in change and better performance in terms of quality (Nicholas, 2010).

Evolution of LEAN Implementation

The following are four key levels of Lean implementation in organizations: (i) Level 1 (use of Lean tools); (ii) Level 2 (creation of flow in processes); (iii) Level 3 (development of a Lean system); Level 4 (consolidation of the system with industry automation 4.0).

In the case study, in 2020-2021 we present an average score of 2.63, distributed by the six factors according to the following graphs (3 and 4).

[Graph 3] [Graph 4]

The values show an implementation level of 66% in relation to the objective, knowing that according to the LAI / MIT model the actual level of (2.63) compared to the maximum of (4) represents that the organization is in the implementation phase process flow and in-line systemic approach represented by level (3).

The LEAN Method followed

The Lean method followed is supported in a system of balancing and integrating three fundamental concepts of all Lean models, which are definition of the Purpose for the realization of all actions, projects and programs, defined as the reason or reasons why it is going to be realized event, whether strategic, tactical or operational (Womack, 2016).

Flow Time

In [Table 8] we represent what in practical terms is meant by value and waste, in order to illustrate the ways of acting in order to maximize the former and reduce or eliminate the second, core essence of the Lean management philosophy.

[Table 8] Leadership with the Value Chain

In the concrete case study, we intend to support the execution of strategies, implementation and management of the new governance and performance model, in a leadership philosophy known as the "Global Value Chain of the Company - Operational Excellence", which allows the optimization of (Lopes, 2011, and 2016), which is a new approach, less hierarchical, more participatory and responsible (Lopes, 2011 and 2016).

The value chain we speak of enables the company's leadership in an integrated way to achieve the results expressed in the objectives, thus creating value for clients and shareholders (Cameron, Quinn, DeGraff and Thakor, 2006).

In practical and real terms, the top leadership is cemented and implemented through an executive management body "executive committee", represented by the directors and coordinated by the CEO that establishes the connection with the Board of Directors, organ in which it takes place as Executive Director (Lawrence, Lenk and Quinn, 2009).

Actions Plan

The set of these actions and their integration with the company's strategic principles base and main performance of the top management, allow a permanent contact with the operational terrain (Gemba) (Womack and Jones, 2006), thus doing justice to one of the basic principles' leadership role in the logic and spirit of Lean management - "go with your own eyes and lead by example" (Shook, 2010).

Value Creation Flows

The identified flows are (i) the productive flow, supported by the factories and their productive processes; (ii) the flow of materials, referenced to all movements of materials within the company and by the values of inventories and their locations; (iii) the flow of information, usually referred to as "from ordering to receiving the customer" (Womack and Jones, 1996).

Productive Flow

The great organizational innovation in the area of operations and the production flow of the company was based on "Takt Time" - contribution of each operation to the total production process, which allowed for profound changes in the form and management model of industrial processes, allowing its balancing (Womack and Jones, 2016) (Figure 1).

[Figure 1]

As we can see from the figure, we have the importance in terms of weighting in the overall process of each of the productive units, with parts and components representing 38.74%, manufacturing and assembly 54.45% and manufacturing and complementary assembly 6.81%.

Materials Flow

The flow of materials was designed to follow the production flow, considering its continuous and continuous optimization, with the clear objective of working without the wastes of waiting, lack of materials, excess production and excessive stocks (Figure 2).

[Figure 2]

After analysing and implementing corrective measures, the company's global stock fell by 38% in 3 years, representing a significant gain in turnover, improvement in working capital and, consequently, in cash flow. This in terms of results, from the operational point of view improved the liberation and management of space, procurement and procurement policy and also the reduction of the levels of risk of obsolescence.

Information Flow

The organization and the good management of this value chain are of central importance for the success of almost all the processes of the company, considering that they will be the following four areas: (i) Markets, clients, marketing and engineering; (ii) Business Management; (iii) Production planning and control; (iv) Shipment to customers, which we detail and explain in (Figure 3).

[Figure 3]

The optimization of the information flow was based on the PDCA tool, previously presented, that allows the constant verification and correction of the processes (Womack and Jones, 2016).

Strategy and Deployment - Business Chain

The immediate bet markets are clearly competitive, but they will be future bets, such as: Iberia, Algeria, France and Central and Southern Africa. These markets have different approach characteristics, but there are some common denominators, such as aggressive price policies, the usefulness and appropriateness of the solutions, and a great deal of sensitivity to the various marketing policies, whether they are advertising, or distribution channels and services. after-sales service (Kotler, 2014).

In [Table 9] the main illustrative values of strategies for the development of the business chain are illustrated.

[Table 9] Results

In general terms, a 38% growth has been achieved in which international activity, considering the nuance of the Spanish market, currently accounts for 70% of the company's business, in which it previously represented 59%, knowing that it still exists also a strong growth in the domestic market (Holweg, 2006).

Company Competitiveness

The competitiveness of companies is supported by the ability to execute their strategies, which in turn is supported by various elements of development and evaluation, from the constant adaptation of their structure, optimization of business processes in favour of productivity increases and optimization and cost reduction (Haidar, 2012).

The interconnection of these factors with the Research & Development capacity, translated into the creation and launching of new products, services and solutions, for customers and markets, are factors of measurement of competitiveness with particular importance (Grant, 2016).

In [Table 10] we show the reduction of costs in the perspective of the optimization of processes reducing the categories of waste related to excess inventories, rework operations and waiting times (Desai and Ferri, 2009).

[Table 10]

In addition to the three cost areas highlighted, the management costs related to the budgetary deviations that represent in the specific case of (27.9%) are also subject to action, which are in the first line of action of the Company. responsibility of the company's executive management structure, thus promoting accountability and greater effectiveness in solving problems.

In [Table 11] we report the cost analysis from the perspective of the quality costs according to the methodology of (Crosby) (Russel & Taylor, 2014), that allows the observation and the decision making and measures more directed and effective to each one of the elements of cost and consequently a greater preponderance in its rationalization or optimization.

[Table 11]

From the analysis to the data of the table we observed that the prevention category (35%) is connoted with rationalizations of structure and framework costs, the evaluation category (25%) is related to models and methods of quality management betting more and more on scientific aspects of statistical control and self-monitoring (Piper, 2010 and 2011).

In the following categories we relate internal and external faults, internal faults (30%) typically related to manufacturing nonconformities or support areas, which must be followed and corrected by quality reports and external faults normally attributed to defects found supplies or third-party information.

The improvements of (14%) already verified and of more (12%) objectified, will surely be implemented through the combination of sales growth and cost rationalization, concretely doing more with less (Womack and Jones, 2012).

Management Indicators Analyses

The management indicators were outlined in three fundamental categories, which allow us to follow and evaluate the performance of the processes, as well as the operational and financial impact of the integration of the various categories, which are: Competitiveness Indicators; Economic indicators; and Operational and Financial Indicators (Hejazi, 2015).

Competitiveness Indicators

In [Table 12] we present the main competitiveness indicators adopted and developed, through their application and adaptation to the reality of the organization and business, with the principles of increasing the qualitative and quantitative competitiveness indexes.

[Table 12]

From the observation of the evolution of the competitiveness indicators, we can highlight the qualitative improvement through the NPS – Net Promoter Score (80%), by listening to customers' opinions about the company's performance in various parameters (Kaplan and Anderson, 2007 and 2016).

Operational, Economic and Financial Indicators

In [Table 13] we analyse the evolution of the economic and financial indicators, first table, but mainly the link between the operational indicators and the economic and financial indicators that translate into a consequence of the good performance of the previous ones (Damodaran, 2019 and 2020).

The evolution of the economic and financial indicators treated are clearly the consequence of the operational indicators (Kracklauer, Janssen & Dorr, 2010), as shown in table, where the evolution of values is in stock rotation (3.2%); Working Capital (4.65%); EBITDA margin (15.6%); and Net Cash Flow (46.7%).

[Table 13]

The clear implication of value creation comes from sound management to reflect the results of the actions, in the return results to shareholders, represented by the Working Capital, EBIT and Net Cash Flow indicators (Emiliani, 2007).

Discussion

We would like to understand the impact of all the actions plan in the improvement results for the indicators, that will impact the EFQM score at the end, this is the normal management flow of a company.

According to Cameron, Quinn and DeGraff (2006), the implementation of a management model will lead management to a leadership style conducive to value creation and results in terms of quality, human and financial capital based on effective organizational performance.

Development and implementation of the strategic plan: Strategic Map, Actions and Strategic Objectives, until then non-existent.

Plan of Activities: Annual objective, maps of implementation of the strategy, deployment by functional areas and documents related to the strategic plan, which allow the common guidance of management units, such as (i) Market Studies; (ii) Business Plans; and Quality Plans (Womack, 2007).

Project of Change and organizational development according to Kotter (2008), was the model chosen by the top management as a way to guarantee the systemic implementation, based on the following pillars of action: (i) Top Management Actions; Definition of Objectives; and (iii) Implementation Practices, supported by the change in Company Culture (Values and Behaviour).

(Context), the systemic thinking of Katz and Kahn (in Grant, 2012), through the open systems model, evidence the general environment and the organizational context creating the process of functioning through the inclusion of resources to the production of "outputs", modified by the elements characterizing the context, such as: (i) Culture; (ii) Objectives and Strategies; (iii) Behaviour; (iv) Processes; (v) Technology; and (vi) Structure. In our localized approach at the level of the EFQM model.

Phased implementation, with the creation and development of pilot areas, is particularly beneficial to the organization's culture, and also engaging people and the cascading communication process, as qualitative process, that is reflected in the improvement indicators result, already reported in tables 10, 11, 12 and 13, taking in consideration the risk management approach, where the results are demonstrating the improvement % in the key performance indicators, from the first period up to date.

The entry into the "way of life" of the company when defining the long, medium and short-term improvement cycles, in which the use of the DMAIC and PDCA cycles in an integrated and complementary manner (Basu, 2011), through the Lean tools.

According to (Kaplan and Norton, 2012) the use of the Balanced Scorecard allows the organization and correct allocation of the management indicators, thus ensuring its correct and effective follow-up to the objectives.

Improvement of the overall EFQM index by 35%, passing from one year of 540 to 730 points, that is the main key performance indicator we have used to understand the overall improvement.

Implementation of the corporate risk management model based on five pillars: (1) Market Risk; (2) Credit Risk; (3) Operational Risk; (4) Legal Risk; and (5) Information Systems Risk (Kendall, 1998).

The development of the model considering the Stakeholders: Clients and Shareholders, leading to value creation, which according to Black, Wright and Bachman (2000) is achieved by setting goals in all areas of the company, solving problems, optimizing the processes of the business and involving the teams with the appropriate means.

According to Cameron, Quinn and DeGraff (2006), the strength of value creation stems from the model of action and achievement of objectives through the LEAN transformation (Shook, 2010).

Strongly active behaviour of top and middle management, according to Quinn (2004), transition from the normal state to the fundamental state of leadership.

Management of skills, knowledge and talent, providing the success of the teams (Cascão, 2014).

Strategy and Deployment: always associated to the business chain supported by the diversity and segmentation axes, marketing policies and established criteria, such as geographic distribution network (Kotler, 2014).

Company competitiveness - supported by cost optimization of internal business processes, considering the categories of: (i) Excess stocks; (ii) Rework Operations; (iii) Waiting times; in addition to the budgetary deviations that represented (27.9%) deviations in costs, which is one of the rationalization opportunities.

Implementation of the analysis of quality costs, in four categories: (1) Prevention (35%); (2) Evaluation (25%); (3) Internal failures (30%); and External Failures (10%).

Leadership Behaviour, according to Shook (2010), should be focused on management by example, having all people involved and committed, putting know-how ahead of "think what," instilling principles of continuous improvement, testing before opting for solutions to market problems or needs, building trust in teams and people, developing mutual trust, developing people first and foremost as products, accomplishing all this and dealing with day-to-day functions.

Analysis of the data and results of the management indicators, which according to Hejazi (2015) were divided into categories: (i) Competitiveness (with changes between 40% and 80%), whether qualitative or quantitative; (ii) Operating, Economic and Financial (with changes between 3.2% and 46.7%).

Conclusion

The initial process of implementing the LEAN management philosophy in the company made it possible to understand that the main objective of this action would be to create, develop and apply a management model adapted and adapted to the organization that should be based on the LEAN system, integrating diverse tools and concepts that would allow it to be present in the vanguard of the current management.

Given the increasing demand of markets, the introduction of new and more demanding customers and the most effective approach in terms of quality.

The strongest penetration in the international area of business, agricultural and transportation units, and of course the gathering of customers in the current business, combined with industry and the automotive markets, also created the need for the Company Management to evolve at all levels.

With the implementation of the Management Model, which at the beginning of the walk, we did not have the idea that we could proceed in this direction, we conclude that the modular and systemic logic allows to verify that:

All organizations, their teams and all people need a defined path to be motivated in pursuit of common goals (Shook, 2010) and (Womack and Jones, 2016).

The key tools or elements for defining common goals is strategy definition through the creation and development of strategic, coherent and participatory maps.

The consolidation of the strategic maps must be carried out in a management system that is the strategic plan, embodied in terms of valuation and rational in the budget and business plans (Kaplan and Norton, 2016).

According to Grant (2012) it is fundamental that the strategies supported in the motivation of the people and in the definition and follow-up of objectives, are implemented by appealing to what are called successful strategies through the execution capacity, by the functional areas.

Areas in which the priorities for action are defined, the strategies to be developed, the target areas of action, indicators of progress and objectives, according to Grant (2002), allows the success of the implementations.

Risk Analysis and Initial Diagnosis - the involvement of the most experienced teams in this phase was central to defining the main problems and opportunities for improvement, according to Shook, (2010) and Womack and Jones, (1996).

The task holders in the various processes are the most knowledgeable of their difficulties, and if they know how to solve it is another issue, for that we had to change (Abzari, Mehdi and Fatemeh, 2011).

The evolution of management indicators (financial, customers, internal processes and learning and growth), allowing to raise the level of management performance, integration between areas and improvement of reference values; and Evolution according to the EFQM model, which allows us to measure and follow over time the qualitative and quantitative improvements, as well as the technical and behavioural aspects;

We came here to the Lean Management Model (LMM) through the program called "LEAN Transformation", based on the implementation of the PDCA and focused on the triangle base of the action (Purpose, Processes and People), improving management indicators in values between 25% and 50%, from productivity, material flows and information flows.

We evaluated the LEAN implementation levels according to the LAI (LEI Advancement Initiative) Model, through the six parameters of the defined scale: (1) Involvement of People; (2) Value Creation; (3) Value Chain; (4) Flow of Processes; (5) Notion of "PULL"; (6) Index of Perfection, obtaining (66%) of the level of implementation, considering the scale we will have more (34%), of opportunity for improvement.

The Behavioural Performance was and is being supported in the development of the leadership capacities of all the coordinators and directors of the company and in the management of competences, of the knowledge and the talent of all the people, through actions of Coaching that methodologically based on the cycles of experimentation, training and practice of processes. The "KATA Coaching" improvement cycles, according to Rother and Shook (2003), are based on the Production Management System created for the company and on process flow optimization tools.

Leadership - is a topic with treatment and particular importance in this process of transformation and in the case in particular through changes in the shareholder body, the change of generation and especially by the inclusion of the professional management team. In fact, the transition from leadership to most functional and operational teams was also promoted (Quinn, 2000), from the normal state to the ground state, seeking to focus on teamwork, joint coordination and cohesion, focusing on others rather than on themselves, being more client-oriented and flexible rather than internal focus and only in control activities (Watkins, 2007). The leadership approach is considered in a value chain, as a model for the management and follow-up of the evolution of the company's processes, supported by the leadership action plan that concretely acts in the strategic, tactical and operational variants, always managing the creation flows of value: (i) productive; (ii) materials; (iii) information (Yukl, 2002).

Strategy and Unfolding - We believe that the best solution would be to treat the theme under three fundamental points of action and implementation: (1) The business chain, supported by the concepts of diversity and segmentation of markets and Ansoff products in (Kotler, 2014), including a geographical criterion; (2) Competitiveness of the company, through the good management of inventories, costs and waste of activities; (3) Quality, improving Prevention and Evaluation procedures, managing and following internal and external failures, naturally centred on customer complaints and nonconformities of processes.

Management Indicators that allow us to naturally follow the evolution of results and simultaneously stimulate the setting of objectives, indicators of competitiveness, quantitative and qualitative indicators have been developed, as well as operational, economic and financial indicators. We also change here the management position of the company at all levels, considering the contribution of people and areas to the overall results. It reflects the strategy's unfolding, based on its valorisation and follow-up, through the integrated monitoring elements, supported by the Scorecard model (Basu, 2011), and the integration of management tools.

We conclude definitively that modern management systems can adapt to centennial organizations and function in perfect harmony with the experience demonstrated over time, considering that the critical success factors are based on the formation and transformation of leadership styles, and effective management programs communication, (Mann, 2016).

The Portuguese Culture is of excellent performance, whenever people are called to participate and this process of good communication is carried out consistently.

The performance is often based on creativity, considering the behavioural binomial of using local thinking to develop global action strategies (Lopes, 2016).

Although we understand that there is a reserve of productivity, that the performance of the business fabric is associated with low levels of effectiveness, which can be resolved with the application of global management models such as LEAN Management (Lopes, 2016).

References

- Abzari K., Mehdi R. Madani P. and Fatemeh T., (2011). The Effect of Internal Marketing on Organizational Commitment from Market Orientation viewpoint. *International Journal of Marketing Studies*, 2-11. <https://www.ccsenet.org/journal/index.php/ijms>
- Basu, R., (2011). *Fit Sigma – A Lean Approach to Building Sustainable Quality Beyond Six Sigma*. John Wiley & Sons Ltd, UK.
- Burket, E., (2016). Characteristics of older people with cognitive impairment attending emergency departments: a descriptive study, uq.edu.au.
- Black, A., Wright, P., Davies, J. (2000). *In search of Shareholder value, managing the drivers of performance* (second edition), Financial Times Management.
- Cascão, A., (2014). *Gestão de Competências do Conhecimento e do Talento*, Edições Silabo, Lisboa.

- Cameron, K., Quinn, R., Degraff, J., Thakor, A. (2006). *Competing Values Leadership: Creating Value in Organizations*, American Psychological Association.
- Industry Directions, Executive Brief, (2005), “Becoming a Lean-Driven Organization”. Conference LEAN Management (2009), Lisbon May.
- Damodaran online, (2019 and 2020). Support for Calculation of Financial Data. Retrieved from: <http://pages.stern.nyu.edu/~adamodar/>
- Desai, M. and Ferri, F. (2009). *Understanding Economic Value Assesed*, Harvard Business School (2) 5-13.
- Emiliani, B. (2007). *Real LEAN – Understanding the lean management system*, clbm, LLC, USA.
- Flick, U., 2002. *Métodos Qualitativos na Investigação Científica*, Lisbon: Monitor.
- Grant, R. (2012). *Contemporary Strategy Analysis Text Only 8th Edition*, John Willey and Sons.
- Grant, R. (2016). *Contemporary Strategy Analysis Text Only 9th Edition*, library congress publishing.
- Haidar, J., (2012). *The Impact of Business Regulatory Reforms on Economic Growth*. IDEAS Publishing.
- Hejazi, S. (2015). *Translation of Binomials in Hard News*. Richtmann publishing.
- Herron, C., & Braiden, P., (2007). “Defining the Foundation of Lean Manufacturing in the context of its origins (Japan)”, *IEE Manufacturing Engineer*. Holweg, M., (2006). “The genealogy of Lean production”, Elsevier B.V.
- Lawrence, K. Lenk, P. Quinn, R. (2009). *Behavioral complexity in Leadership: The psychometric properties of a new instrument to measure behavioral repertoire*. Elsevier. *The Leadership Quarter* (2) 2-16.
- Lopes, A., (2011). *O papel da liderança intermédia na gestão dos choque de culturas*. Editora RH Lisboa.
- Lopes, A., (2016). *Ciências Sociais : especialização versus amplitude e profundidade de problemas complexos, nomeadamente os organizacionais*. UAL, CIP.
- Machado, V. Cruz, & Pereira, A., (2008). “Modelling Lean Performance”, *IEEE ICMIT*.
- Mann, B., (2016). *The effect of physical and academic stress on illness and injury*. *Journal of strength and conditioning research*, 30 (1).
- Nicholas, N., (2010). *Understanding the Mental Capacity*. TOG.
- Nokes, J., (2007). *Teaching High School Students to use Heuristics while reading historical texts*. *Journal of educational psychology*.
- Papanikos, G., (2010). *International Essays on Small and Medium Sized Enterprises*, Academia EDU.
- Piper, T., (2011). *Assessing a Company’s Future Financial Health*. Harvard Business School, 1215.
- Quinn, R., (2000). *Change the World: how ordinary people can achieve extraordinary results* (Jossey – Bass Inc., Publishers).

- Quinn, R., (2011). Building the bridge as you walk on it: a guide for leading change (John Wiley & Sons, Inc.).
- Quinn, R., (2006). Loex Conference for Instruction Librarians, Entering the Fundamental State of Leadership, The Changing Role of the User Instruction Librarian, Retrieved from: www.emich.edu/public/loex/loex2004/quinn.htm.
- Ross, A., e Francis, D. (2003). “Lean is not enough”, IEE Manufacturing Engineer”.
- Russel, R., Taylor, B., (2014). Quality Management: Operations and supply chain management, John Willey & Sons, Inc.
- Rother, M., & Shook, J. (2003). “Learning to see – Value Stream Mapping to Create Value end Eliminate Muda”, Lean Enterprise Institute.
- Santos S., (2020). “The reindustrialization of Europe – Portugal as Cluster”, eco.sapo.pt.
- Schuh, G., Lenders, Michael, & Hieber, Solveigh, (2008). “Lean Innovation: Introducing Value Systems to Product Development”, PICMET Proceedings, 27-31 July, Cape Town, South Africa © PICMET, IEEE.
- Shook, J., (2010). How to change a Culture: Lessons from NUMMI. MIT SLOAN Management Review.
- Shook, J., (2016). Research, Reflections and Challenges. LEAN Leaper keynote.
- Speitzer, G. & Quinn, R., (2001). A Company of Leaders, San Francisco: Jossey Bass.
- Kaplan, R. & Anderson, S. (2007). – Time Driven Activity Based Costing – A Simpler and More Powerful Path to Higher Profits, Harvard Business School Publishing Corporation, USA (3) 12-18.
- Kaplan, R. & Anderson, S. (2016). – Time Driven Activity Based Costing – Theory, Applications and Limitations. Journal of Management Studies 9 (3): 457-482.
- Kaplan, R. & Norton, D., (2012). The Execution Premium. Linking Strategy to Operations for Competitive Advantage. Harvard Business Press.
- Kaplan S., and Aderson S. (2016), “Time Driven Activity Based Costing – A Simpler and more powerful path to higher profits”, Harvard Business School Press, USA.
- Kendall, R., (1998). Risk Management for Executives: a practical approach to controlling business risks. Pitman Pub.
- Kracklauer, S., Janssen M., Dorr E., (2010). Optimizing Business Performance in a Volatile Recovery. The Hackett Group 1-10.
- Kotler, P., (2014). Marketing Management. Pearson Publishing, 15th Edition.
- Kotter, J., (2008). A Sense of Urgency. Harvard Business Press.
- Kumar, S., (2021). Risk Culture is a Necessary Condition for Enterprise Risk Management to Succeed, Academia Letters.
- Watkins, M., (2007). Infectious Leadership, Harvard Business Review, n. 3, October.

Womack, J. (2007). “Moving Beyond the Tool Age”, IET Manufacturing Engineer.

Womack, J.; Jones, D., (1996). LEAN Thinking: Banish waste and create wealth in your corporation. Simon and Schuster.

Womack, J.; Jones, D., (2006). LEAN Thinking: Banish waste and create wealth in your corporation. Simon and Schuster.

Womack, J.; Jones, D., (2010). LEAN Thinking: Banish waste and create wealth in your corporation. Simon and Schuster.

Womack, J.; Jones, D., (2012). LEAN Thinking: Banish waste and create wealth in your corporation. Simon and Schuster.

Womack, J.; Jones, D., (2016). LEAN Thinking: Banish waste and create wealth in your corporation. Simon and Schuster.

Womack, J. (2016). “Moving Beyond the Tool Age”, IET Manufacturing Engineer.

Womack, J., Jones, D. and Ross, D., (2010). The Machine that Changed the World (13th Edition). Simon and Schuster.

Yukl, G. (2002). Leadership in organizations (Prentice–Hall, Inc.).

Zammuto, R., Gifford, B., Goodman E., & Eric A., (2000). A Competing Values Perspective, in

Ashkanasy, et al, (2000). Handbook of organizational culture and climate (Sage Publications, Inc.).

Chart 1. Fundamental Elements of the Model

Model area	Element	Weight %
Means	Leadership	10%
	People	9%
	Politics and Strategy	8%

Results	Partnerships and Resources	9%
	Processes	14%
	Results of People	9%
	Customer results	20%
	Social Results	6%
	Performance indicators	15%

Source: *EFQM*

Table 1. Methodologies

Project Management	Define	Organize	Implement	Close
DMAIC	Define	Measure	Analize	Improve
PDCA	Plan	Do	Check	Act

Source: *Basu, 2011*

Table 2. Methodology DMAIC cycle details

Define	Measure	Analize	Improve	Control
Reason for project realization	How can we measure the current moment	Deviations and obstacles and cause of problems	Actions to be implemented to correct and improve	Results, risks and progress report

Source: *Basu, 2011*

Table 3. Methodology DMAIC cycle details for each phase

Define	Measure	Analyze	Improve	Control
Description of processes in phases	Graphs and charts with indicator values	SWOT Analysis Five Whys? Pareto and ABC analysis	5S SETUP Reductions and Non-Productive Time	GANTT PDCA Control maps of Action Plan

Source: *Basu, 2011*

Table 4. Management Follow-up Model (BSC)

Perspective	Key Performance Indicators
Financial	Cash Flow; EBITDA; Management Fund
Customers	Sales; Relative Quota; Competition; Margins; Complaints and NPS (Net Promoter Score)
Internal processes	Stocks; Capacity; Efficiency; NPS; Unconformities
Learning and Growth	New products; Knowledge; Formation; Absenteeism; Environment and Safety; New Markets and Customers; Information systems

Source: *Kaplan & Norton, 2007.*

Table 5. Company LEAN Model

<u>Purpose</u> Mission Customer Value Goals	<u>People</u> Culture Learning Leadership
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<u>PDCA</u> Problem-solving Cadence of Work Leadership Involvement	<u>Processes</u> 5S Standard Time Production Flow Visual management
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Source: *Company data*

Table 6. LEAN Model Development

<u>Purpose</u> Improve Efficiency Improve quality and safety at work rates Reduce costs Objectives of the strategic plan and activities	<u>People</u> Leadership Training Communication
<u>PDCA</u> Troubleshooting Work Cadence Leadership Involvement	<u>Processes</u> 5S Standard Times Flows Visual management

Source: *Company data of applicated model*

Table 7. In practice and in numbers

All lined up to keep	First round improvement
Better internal instructions between areas	35%
Improve reaction to error correction	25%
Doing good first by reducing unplanned operations	30%
Improve supplier selection	25%
Much greater attention to customers to avoid hassles and unnecessary rework	50%

Source: *Company data reports*

Table 8. Flow and Waste

<u>Value</u> Provider Developing products Production Client	<u>Waste</u> Inventory Rework Waiting time
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Source: *Company data*

Table 9. Business Chain

Markets	Ibéria	Algerie	Balcans	France	Rest of African
Distribution	49%	26%	4,8%	9,5%	10,7%

Source: *Company data*

Table 10. Process Cost Reduction

Waste	Cost level
Excess Inventory	20,9%
Rework operations	23,2%
Waiting time	28%

Source: *Company data*

Table 11. Quality Cost Improvement

Categories	Costs in percentage
Prevention	35%
Evaluation	25%
Internal Failures	30%
External Faults	10%

Source: *Company data*

Table 12. Key Performance Indicators

KPI	Value
Cost savings on process flows	45%
Reduction of product and project development times	60%
Increased Engineering capacity - charge new projects	40%
Improved Customer Satisfaction - NPS - Net Promoter Score	80%

Source: *Company data*

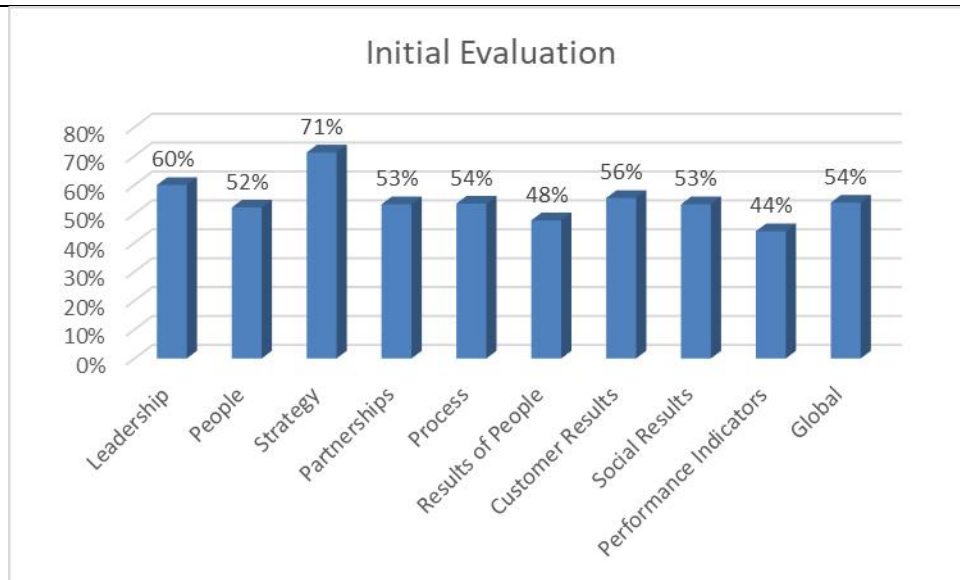
Table 13. Operational, Economic and Financial Indicators

KPI	Value
Stock Turnover	3,2%
Working Capital	4,65%
EBIT level	15,6%
Net Cash Flow	46,7%

Strategic KPI	Operational effect
Stock Turnover	Inventory reduction
Working Capital	Stocks and Collection
Customer Satisfaction	Customer Complains
EBIT Level	OEE
Net Cash Flow	Sales improvement, Investments and cost management

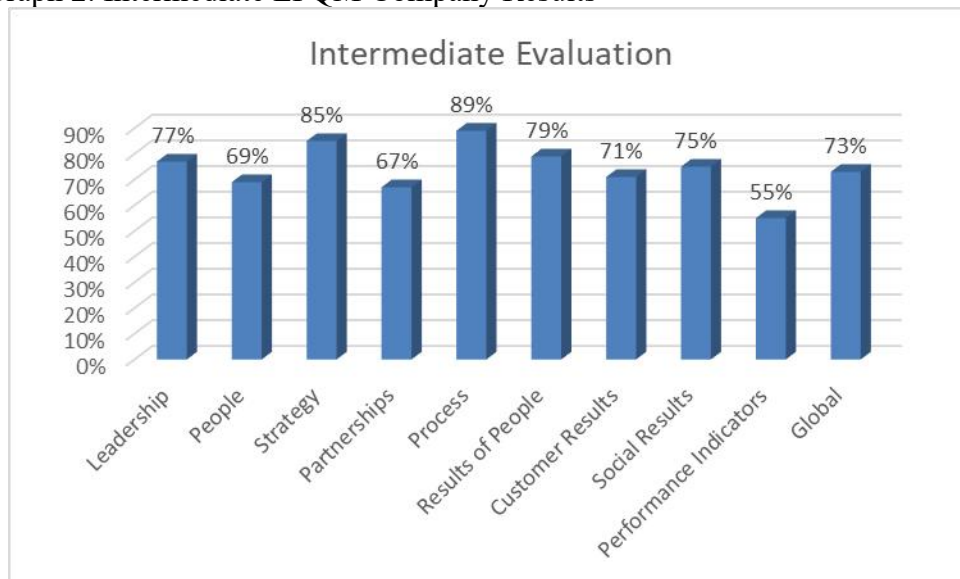
Source: *Company data*

Graph 1. Initial EFQM Company Results



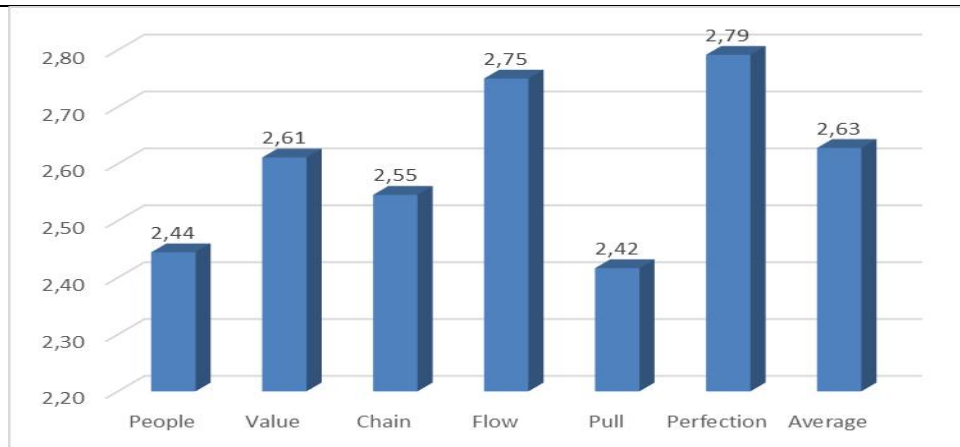
Source: *Company data assessment*

Graph 2. Intermediate EFQM Company Results



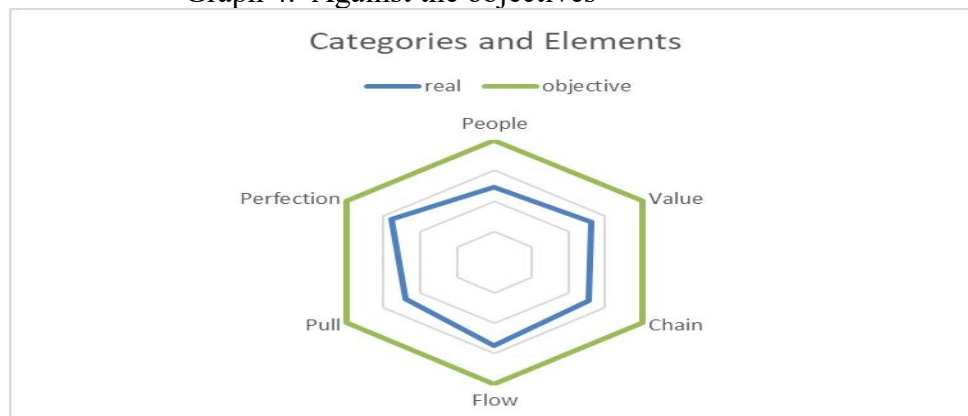
Source: *Company data assessment*

Graph 3. Company Model LEAN level



Source: *Company data assessments*

Graph 4. Against the objectives



Source: *Company data assessments*

Figure 1. Productive Flow

Factories	Base. Processes	Takt Time %	People in Production
(1) Parts and Components	Cutting, forging, CNC, shafts and cylinders	38,74%	79
(2) Manufacturing and Assembly (SJ)	Bending, Assembling and Robotics, Final Assembly, Stripping and Painting	54,45%	111
(3) Manufacturing and Assembly (A)	Bending, Assembling and Robotics, Final Assembly, Stripping and Painting	6,81%	19

Source: *Company data*

Figure 2. Materials Flow

Typology	Raw material (Warehouse)	Intermediate Warehouses	Shipping (Warehouse)	Production Sections
Raw material	33%			
Finished Goods			25%	
Work in Progress		19%		23%

Source: *Company data*

Figure 3. Information Flow

Markets Customers Marketing Engineering	Market Studies and Projects	Sales Plans	Offers	Price Negotiation	Orders
Management of Business	Sales Plan	Production Plan	Tracking and Correction	Delivery Plan	Shipping
Plan and Production Control	Capacity Studies	Factory Orders	Control of Real VS Plans	Sales Plans	Delivery and quality documents
Shipping to Customers	Packing list	Invoices	Destination and means of payment	Technical and Quality Documents	Receipt and Documents

Source: *Company data*