

Design and Application of an Operational Model to Optimize The Competitiveness And Sustainability Of Smes In A Developing Economy

Guillermo Andrés Buenaventura Collazos, Guillermo Buenaventura Vera
Founder and General Manager of GAB Ingeniería, Cali, Colombia MSc. In Industrial Engineering,
Mechatronic Engineer

Full time professor at Universidad ICESI, Cali, Colombia PhD In Business Administration, MSc. In Industrial Engineering

ABSTRACT: The PYME s (Small and Medium Enterprises) in Colombia currently represent about one-third of the GDP (Gross Domestic Product) and employ more than half of the eligible population to work. The vast majority of these companies do not survive after the fifth year of creation.

The constant threats of very competitive markets and the anguish of inefficiency in operations as these organizations grow are obvious causes of their failure. The way to monitor, control and synchronize its value chain and operations is the fundamental difference between a large prosperous company and an SME 'in the process' of growing and sustaining itself in this competition.

Through the study established here, the specific problems of these manufacturing SMEs are diagnosed from a pilot manufacturing company in Cali, Colombia; Likewise, a low cost and easily implemented solution model is proposed, based on the standardization of modern operational management tools and optimization of operations.

Additionally, the impact analysis that said operations management model has on the financial results of the company is performed, yielding very positive results.

KEYWORDS: PYME (Small and Medium Enterprises), ERP (Enterprise Resource Planning), Causal Diagram, OEE (Overall Equipment Effectiveness), EOQ (Economic Order Quantity), Security Stock, CRM (Customer Relations Management), Dashboard, ROE (Return on Equity), EBITDA (Earnings before Interest, Depreciation and Amortization) .

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I. INTRODUCTION

SMEs (Small and Medium Enterprises) currently represent 30% of GDP (Gross Domestic Product) in Colombia and 70% of employability. However, only 4% of these companies survive after their sixth year of operation. It is these companies, which disappear and u n which continue to operate, face the risks environmental participate in highly competitive markets due to the globalización and internal risks posed by the lack of efficiency in operations, the disproportionate increase in their costs when the need to grow the business is pressing. This leads to a threat of financial sustainability.

The way to monitor, control and synchronize its value chain in operations is the fundamental difference between a large prosperous company and an SME, which becomes more evident when it is in a growth stage. Large companies, especially manufacturing companies, understand that your success is to maintain and improve their competitiveness so reinvest ten have ta 60% of its net profit model management, ie in qualified personnel, technological tools, and updated information systems, software, consulting, staff training and other soft investment projects (Brown et al., 2005).

While a Small or Medium Enterprise (PY ME), in most cases, does not have a system Resource Planning Enterprise ERP (for its acronym in English, Enterprise Resource Planning), or something similar, who collaborated and with d dynamic management and the company as not investing enough mind in the qualification of its employees to develop their skills, expertise and capacity management; and even the lack of

harmonization of it is evident as areas of the organization, so that efficient articulate and proactively dynamics and business strategy.

An ERP system and office Staff Administrative could be the answer for an SME. However, cognitive barriers, gaps of experience, strength culture and high costs of modernizing of operational performance, involves laughing access improbable leverage financial profitable (Baena, 2007). The only category of these and possible solutions (ERP system and online Staff) can represent more than 80% of revenue PY ME as fixed cost, and even exceeds its capacity their income (Baena, 2007), a part of the long process that calls the so-called 'learning curve' (Chase, Jacob, & Aquilano, 2009); ie the transition in adaptation, implementation, and modernization and the entire infrastructure, involving a period of economic sustainability and governance of the SME, which hardly make such a radical evolution is allowed as one solution.

Therefore, it is necessary to count on a model of operation appropriate, rapid deployment, rapid adaptation and relatively low cost of access. A model that allows the transition to optimal performance and sustainable growth, which contributes to the governability of operations of one way efficient and competitive (Carranza et al, 2014).

The work presented in this report proposes an operational model for SMEs with three guiding guidelines:

- Technical and professional knowledge,
- The organization, self - coordination, and synchronization of information between positions,
- Fluidity and functionality of the information, keeping it updated, current and at time .

In this study, the case of the SME 'Calzado Caleño', a leather sector manufacturer in Cali, Colombia, is established as a pilot to specify the aforementioned problems, and propose and apply a solution model.

II. BACKGROUND AND CIRCUMSTANCES

Calzado Caleño, the case study, is cataloged as a small business (as defined in the norm in force in Colombia, Law 905 of 2004) manufacturer of leather footwear, which passed or from COP¹300 million to COP 2.000 million in sales per year in the term of four years, and grow from 16 to 32 employees on its payroll, in the period of one year. Their situation rapid growth thanks to the expansion of the domestic market and its foray into international markets, it to have led to incur increasingly errors in office administrative and operational (lack of control in items such as inventories, lack of coordination of production sequences, errors in information between work centers) with the consequent failures in business results.

Therefore the new volumes demand product and for handling the increasing amount of information (plan of requirements subject to them, plan master production, inventories, etc.), the quality of the product and the speed of response to orders have been affected as never before had happened to them, in des thrive direct or profitability of the business and threatening their sustainability.

The planning and the production control are paramount for profitability of an industry (Plossl, 1985) and in the case of the SMEs manufacturing, planning and control of production are aspects handled without major tools or resources, or cognitive (statistical process control for example), or professional is (industrial engineers, or professional levels or levels of postgraduate or master degree people, for example), and much less with technology (ERP software, for example).

The SMEs manufacturing in Colombia, generally, are led by their own unique, which in most cases is its founder. This person is concentrated in all the information of the company, transmits its guidelines and operating directly and, to traditionally takes care of external production situations, such as corporate relations, and commercial relationships and financial. This “ cacicazgo ” management model² , innate and instinctive of these managers PY ME is him growing problems and costly from the operation (Brown, Earle, & Lup, 2005).

As product demand increases, increases also, labor, orders material and need of machinery and space; in general, the need for higher levels of production and productivity are pressing. Along with this, the increases in the quantity and need for information processing and quality controls are imminent and represent extra operating expenses and errors leading to negative outcomes, such as the loss of customers and the detriment of the image and brand for example.

The increase in demand is what is required, then, is a harmonization in an operational, which also is quick and accurate be reliable in quality, productivity, and profitability. This need to respond to higher production volumes and customer demands is not resolved simply by increasing the operational staff and the inherent machines or tools; maintaining production with relatively low costs, that is, at a profitable level, raises

¹COP is the currency of Colombia; 1 USD equals approximately COP 3,000.

²Cacicazgo is a figure assimilated to the pre-Columbian tribes, where the owner decides on the business, according to his feeling, and practically unqualified.

an unquestionable need for professional cognitive tools supported by modern technologies (software and computer systems).

However, even if each department would have with people and tools to computing, it should manage the flow of information, remove biases and deficiencies in communication, to ensure that the vision, direction, planning, and guidelines of the business managed to on one of timing and coordination of efforts in favor of an economic result positive for the company (Brown, Earle, & Lup, 2005).

Today, both the problem of synchronization and communication of information between the departments of the organization, as well as the handling of large volumes of data, are highly studied and developed from computational and computer power to the respective mathematical techniques; thus, it is widely on known and used the very expensive ERP software systems. However, it would not be enough to simply buy and install an ERP system, monitoring, control, and decision-making methods are also necessary, as follow-up indicators (for example, Singer, Amorós, & Moska, 2015).

The company pilot of our study presents the need to synchronize, plan and monitor operations in real-time and controls information chain internal value, from ordering its raw material to the commitment to delivery or shipment to its customers, as you may be going to most manufacturing SME in state of growth.

95% of the SMEs manufacturing in Colombia (according to the Ministry of Industry, Trade, and Tourism, 2011) and 98% of these in Cali (according to the Chamber of Commerce of Cali, 2014) decide to not grow due to the lack of knowledge of managing its operations once the complexity of growth is addressed. It can be said that they are afraid of expanding, conquering greater markets, generating greater income, experiencing greater profitability, because they perceive the action that leads to change or even adjust the operability of the company far, costly and slow.

This reluctance to mature as a company, in aspects operative, and of governance, established for the company an inexorable prospect of commercial death and bankruptcy financial, to the cultural dynamic changing of markets, competition in the substitute products and innovation, in a globalized market, demanded and demanding in costs and strategies of world competition.

III. RESEARCH METHODOLOGY

This work is divided into three main stages:

- Documentary evidence and importance on the problem of governance of manufacturing SMEs with their operational management model and how this is their cause of death as their main barrier of growth and competitiveness limit.
- Detailed analysis of the problem from the case study, the situation of the manufacturing SME 'Calzado Caleño'.
- A detailed approach to an efficient and possible solution, along with its verification through the comparison and projective analysis of operational and financial indicators of the 'Calzado Caleño' case.

IV. ANALYSIS OF THE PROBLEM

Table 1 presents the symptoms of a PY ME manufacturing rapidly expanding, the same found in our pilot company. Symptoms related to problems that represent a real barrier to achieving sustainable operation on a larger scale, becoming a real barrier to growth. They manage to overcome these difficulties and achieve organized growth is what we call maturation.

Table 1. List and the relationship between symptoms, causes, and regulatory factors. (Source: authors)

Symptoms	Causes of the first level	Causes of the second level	Regulatory factors
Low level of service: Incapability and lack of control when responding to all customers and all requests.	Customer advance order	Communication customer	Customer Relationship Management (CRM)
		Predictability of the demand	
	Production responsiveness	Quality problems	Production and Inventory Control
		Production yield	
		Inventory management	
		Supplier default	Supplier Management
Early purchase of raw materials			
	Transport and logistics		
Low business profitability	Portfolio Recovery	Working capital	Administrative Management and Cost Control
	Indebtedness	Financial margin (utility)	

The thick symptoms, as are l to inability to respond to all customers and / or all orders (low level of service) and decontrol good production performance and affection of cash flow, conditions evidence the level of the management of the firm, are a direct and immediate consequence of what we will call first level cause:

- Inability to anticipate customer orders,
- Lack of effective monitoring of the production program, which allows fast realignments,
- Poor management of plant requirements (raw materials, preventive maintenance, time and quantity of labor vs. bottlenecks, etc.)
- Poor monitoring and anticipation of quality problems
- Slow recovery of the portfolio and enter into high indebtedness.

At a more detailed level, entering the causes of second-level (this is done by asking why the mentioned problems) can be identified supervisory methods, control and communication on the operations of the enterprise to like failures fundamental.

With the help of the software 'Vensim'³, the causal diagram is modeled, based on the problem-symptoms perceived by the company manager case study, relating which causes impact which effects and vice versa. Thus, root, reinforcing and regulatory causes are identified, as shown in Figure 1.

These symptoms of 'Calzado Caleño' consistent with the evidence shown in the records of the 'SMEs manufacturing in Trade Cameras when viewed their s economic trajectories in historical of the statements of income (Confecámaras, 2014). Also, compared with larger companies and of higher incomes, the PMEs in Colombia have lower returns and a higher rate of disappearance in the last decade (Martinez & Willia, 2015). Survival enterprise reports, such as the Ministry of Industry, Trade and Tourism (2011), allow to infer the hypothesis of the widespread problem is the models' uptime (how organized an and coordinate to run) and operational management (how information is led and flows in its coordination).

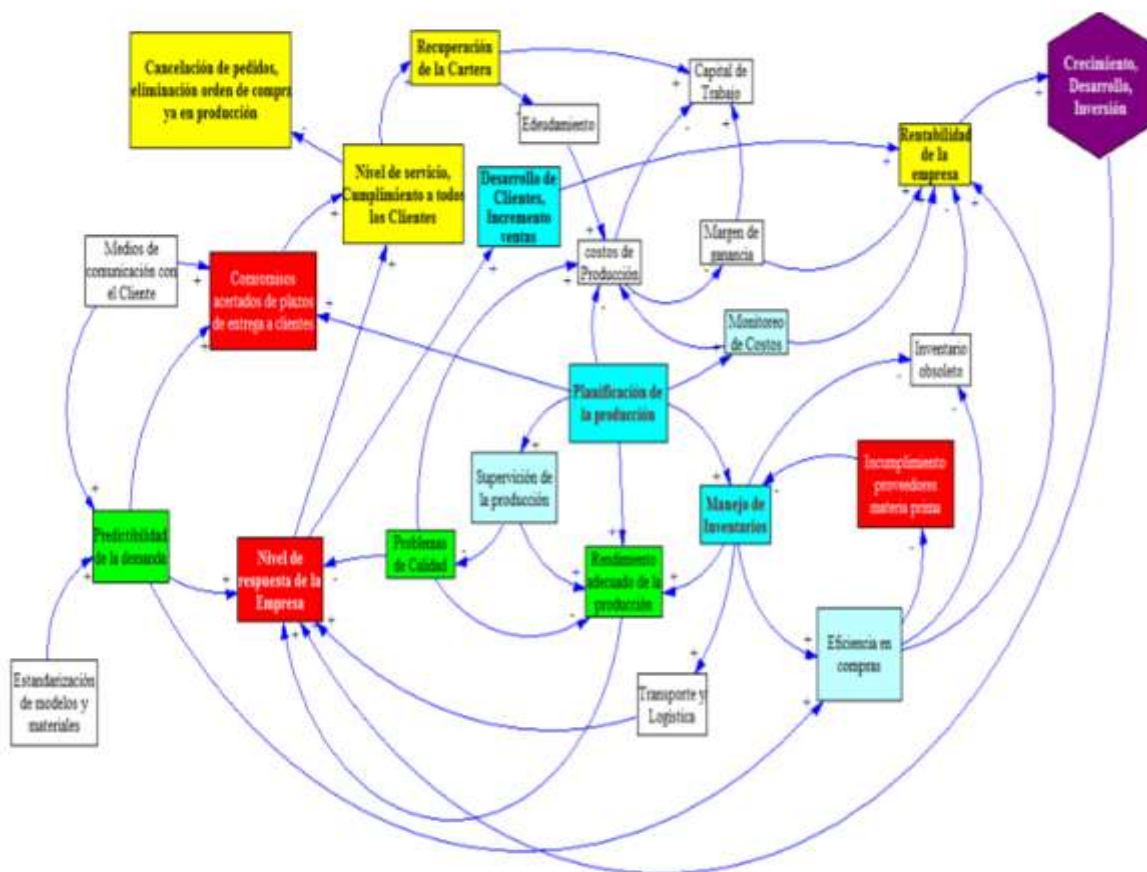


Figure 1. Causal diagram. (Source: authors)

³Vensim is a simulation software developed by Ventana Systems. It is mainly compatible with continuous simulation, with some discrete events and agent-based modeling capabilities.

One of the important situations, derived from the above analysis is that many PY ME s prefer not to grow before reinvesting up to 80% of its revenue, om improves the operational management, professionalizing the administrative positions and injecting technology to L apparatus productive and even the administration of production. A first condition that explains it is the ignorance of the importance of professionalizing and increasing technique in the operations and the lack of confidence in these solutions, which seem to be distant and very indirect on the profitability and performance of the company. A second explanation is the lack of opportunities to obtain credit and leverage financial and to prefer to invest their scarce capital in different something that intervened directly in the field production, and if the pressure of the demands of the market is growing. In the end, this position will result in higher operating costs, greater uncontrolled and failures, and, of course, less competitiveness in the face of the threatening globalization (Amador, 2014).

The causal diagram (figure 1) presents the operating variables in a neutral format and their relationship as a reinforcer (+) or as regulator (-) of some situation, favorable or counterproductive, as appropriate to simulate. Here it is intended to evidence the possible causes of the symptoms found in the case or study, 'Calzado Caleño', to use the Ishikawa diagram in the segmentation of 5Ms (labor, machinery, materials, measurements or methodologies), of these possible causes, as shown in Figure 2.

Ishikawa diagram (Figure 2) shows the causes classified by nature of the problem faced by the company decrease in the level of service (answer to every client is) and the progressive decreased and the profitability of the company, which come from a root cause, the lack of control of production, inventory, and quality.

Analyzing situations in the field, through counts and surveys, Pareto diagrams are constructed on the categories (Figure 3) and responsible areas (Figure 4). The highest frequency of categories corresponds to problems of methodology with 60%, then there are the problems related to measurement and labor that, together with the previous ones, add up to 75 %, that is, that the problems are mainly concentrated in these three items and, in particular, in the categories of methodology and measurements.



Figure 2: Ishikawa diagram for the fundamental symptom or effect: 'Descontrol of Production, Quality, and Inventories'. (Source: authors)

About the activities in charge of the respective matters, there is the management of Production and purchases with 66.7% of associated problems, such as the most significant, and reaching 80% with the problems associated with storage.

The above shows a marked flaw in its operational management model, with clear evidence of the absence of techniques and theoretical tools that allow the appropriate analysis, preparation, and control over its production requirements on time. It is worth remembering that, in a manufacturing company, all its activities should work in favor of its main activity, production, and if this is not established or coordinated, it will be very

difficult to manage an effective result, that is, with the least number of problems and maximum profitability (Brown, Earle, & Lup, 2005).

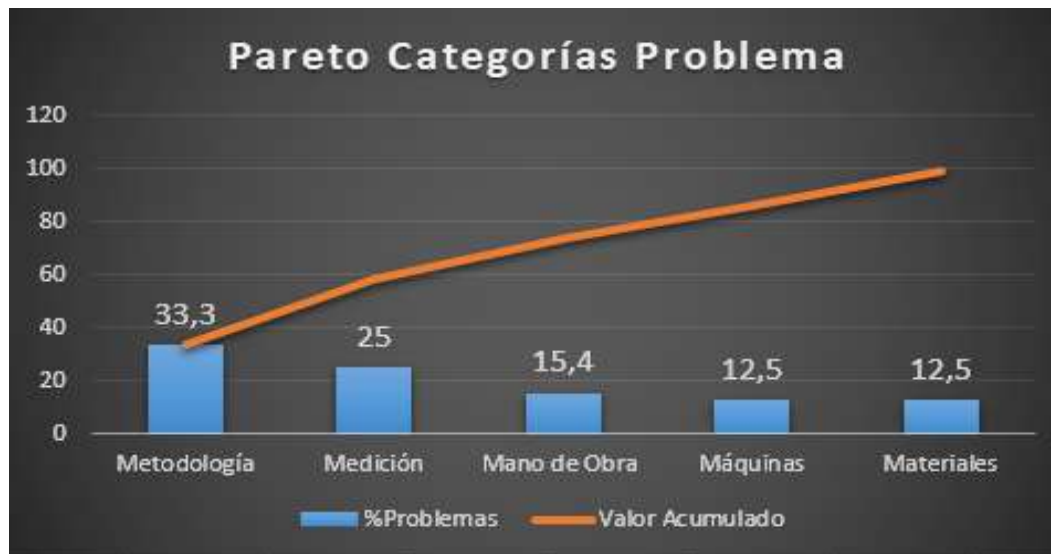


Figure 3: Pareto diagram of problem sources by category (Source: authors)



Figure 4: Pareto of problem sources by area in charge. (Source: authors)

They are identifying the keys conditions to make the appropriate adjustments and optimize the performance of the entire company. The case study is production management as the key business activity that would adjust most problems of the company in this condition for growth. On the other hand, it is diagnosed with the methodology as the category with key problems that must be solved.

V. PROPOSED SOLUTION

The proposed solution is to give a management operational model so that it resolve the problems of efficiency and performance, with its techniques of management science. Is set, then , three stages to propose a solution.

The first stage corresponds to the response to a causal analysis, which justifies and focuses the techniques for each related problem.

As a second technique there is the concrete development of the effective management model, from rapid to adoption, and which results in economic improvements. This stage is considered as the foundation and the company is composed meanlyby persons the coordinates information flows, more important than the machines or the technology thereof; thus, that the operational management model will be reflected, then, as a

detailed guide manual on what information to collect, with what technique to process it and what to communicate to each one, according to the respective functions of the personnel within the areas of operation and control of the business.

Finally, a proactive analysis is carried out on the impact on the improvement of the economic aspects of the company if the proposed model is applied.

5.1 Upon approach to the Solution

To address the solution in the first instance the issues relate thick in Figure 5 (problems and quality, inefficient production, misadjusted production versus demand) with pockets of problems (missed deadlines delivery, low responsiveness of the operation, non-compliance of suppliers) , which give rise to strategic objectives or priority needs (cost monitoring, production planning and supervision, inventory management, purchasing efficiency, blocks in blue), which, at their instead, they are confronted with their industrial engineering techniques, which will conform to the suggested standard management model. Table II supporting techniques relate the solution to each of the problems.

Since the optimizing tools of industrial engineering are sufficient by themselves, administrative management is established as a flow of information

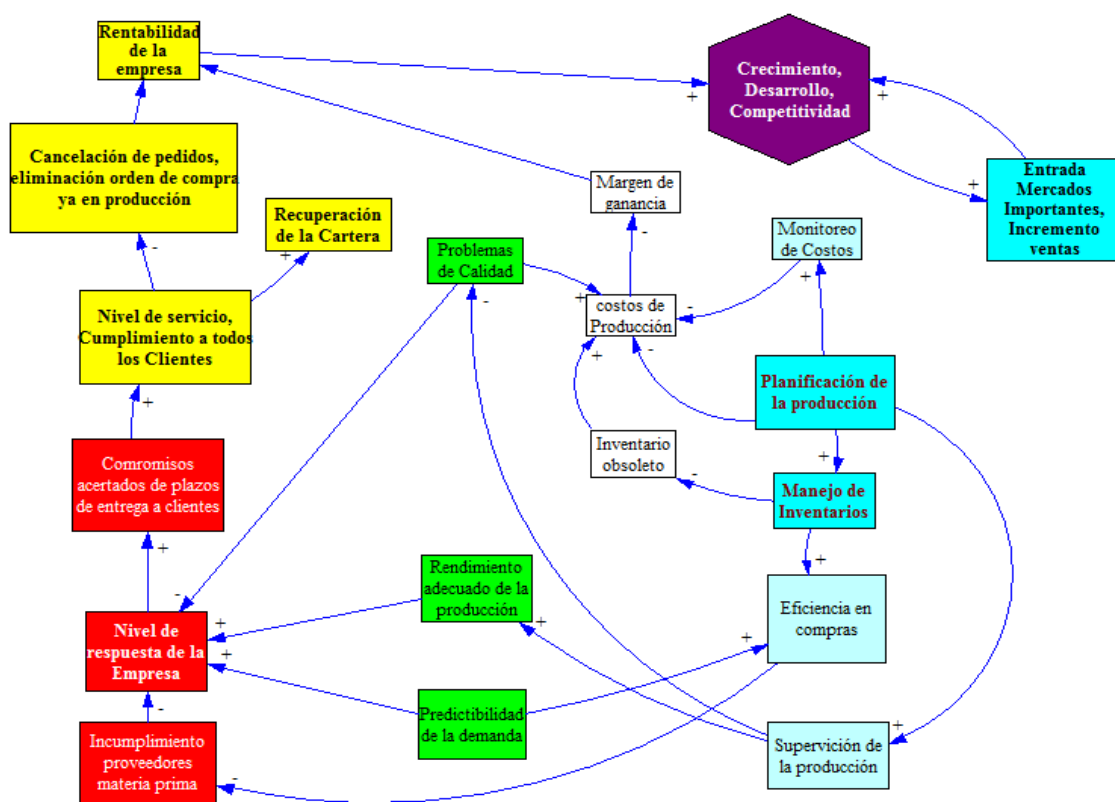


Figure 5: Analysis diagram causal p to find strategic objectives (Source: authors)

5.2 The proposed model for the operational management

In a system rational, props improvement is divided into three logical operating environments, which determine the flows in a management model. A first category, which we call 'Forecast', basically refers to the base information on the conditions of the company to produce, operate and respond in a sequential information mechanism, or by stages, from which the information of the company is fed. Next category The 'Planning', is a second category, for which he is responsible for coordinating a work plan together with all requirements in advance to action. Finally, we have the 'Control' information, which records, monitors and updates the contractual returns that allow us to arrive at the result or compliance with the clients.

Table II. Relationship between strategic objectives and solution techniques. (Source: the authors)

Priority Needs (Strategic Objectives)	Techniques that meet the need
Reduction of errors, reprocesses and waste	<ul style="list-style-type: none"> ○ Analysis of production and productivity yields: OEE ○ MPS: Planning and operations management ○ Online process + performance and quality monitoring, ○ Error registration, statistical control Quality and Commitment of improvements.
Effective purchases	<ul style="list-style-type: none"> ● EOQ (Economic order quantity) ● Inventory Control, Security Stock ● Supplier Administration
Inventory and obsolescence decrease	<ul style="list-style-type: none"> ○ MRP (Materials Requirements Planning), ○ Demand Forecast, ○ MPS (Production Master Plan)
Order fulfillment, complete and with all customers	<ul style="list-style-type: none"> ● Statistical Quality Control ● Pro linear recording of operations
Formalizing suppliers	<ul style="list-style-type: none"> ● Qualification and Supplier Development
Robustness of contracts with customers, avoiding order cancellations	<ul style="list-style-type: none"> ● CRM (Customer Relationship Management), Rate Customers ● Demand Forecast ● Customer service, complaints, and claims (improvement opportunities: customer satisfaction)
Increase industrial capacity and quality	<ul style="list-style-type: none"> ● Visual Control and DASHBOARD: Way to centralize information, communication, and analysis, updated, agile, fast and reliable.
Profitability and profit increase	<ul style="list-style-type: none"> ● Frequent Monitoring of OEE Productivity (Overall Equipment Effectiveness) ● Balance Point Analysis ● Financial Indicators Profit Margin, ROE, EBITDA

Following the connection of the tools with the positions or areas of action within the company, it is shown, in figure 6, which area is responsible for which tool, and its consequent type of information (green lines in the central corridor of the Figure 6), and where the information of each tool goes (green lines in figure 6). To observe this route more clearly, a complete cycle of information flow between commissioned work areas and the corresponding tools is shown in Figure 7.

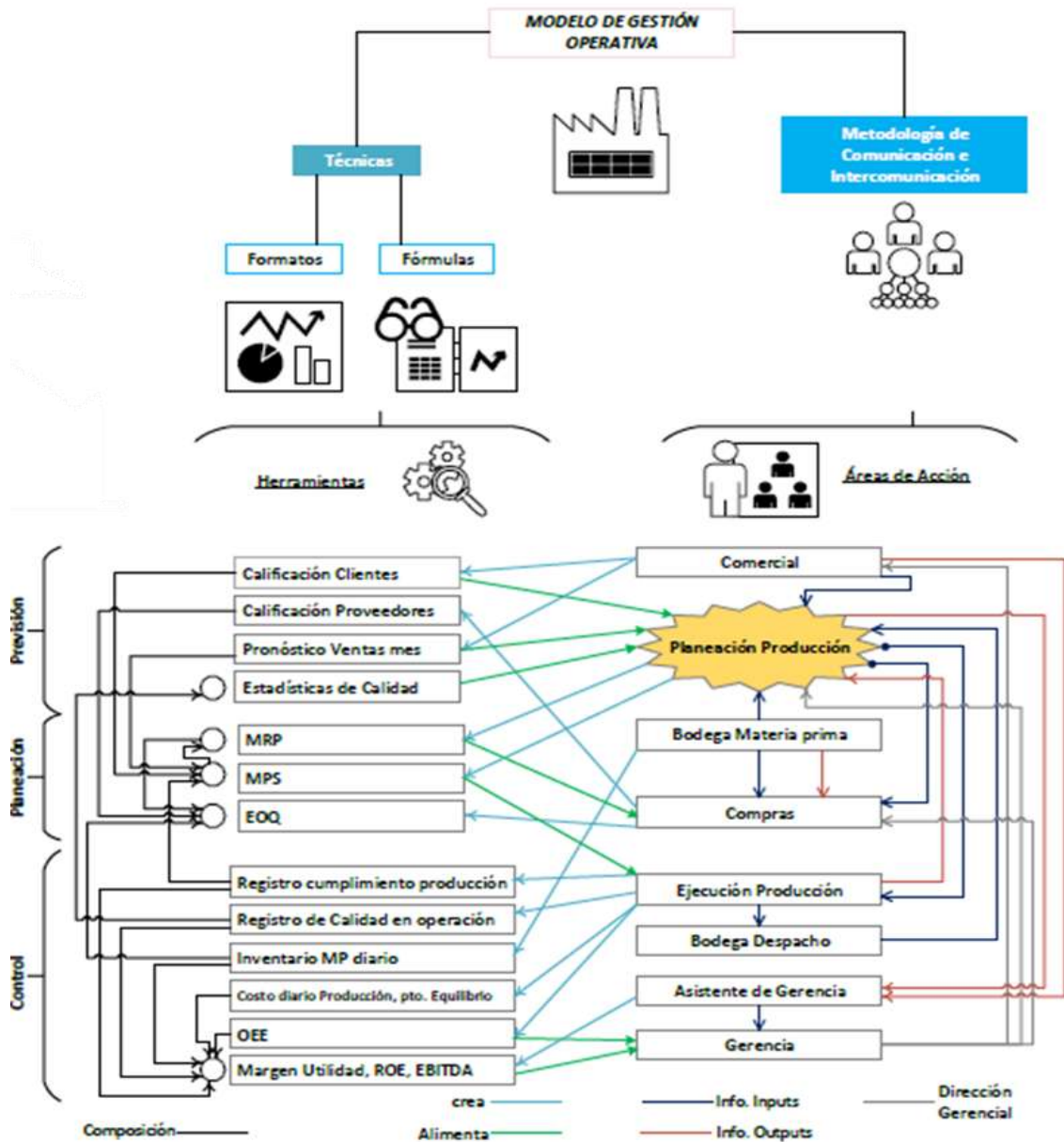


Figure 6: General scheme of the design of the SME operational management model. (Source: authors)

The interaction between areas of the company is established through the 'Methodology of communication and interaction'. Figure 7 presents the solution proposal as a flowchart of information between the different areas of the companies. This scheme presents a logical flow of information, the basis of the design of the standard communications system that is proposed as a solution principle. It establishes the functions and information records that make up the flow.

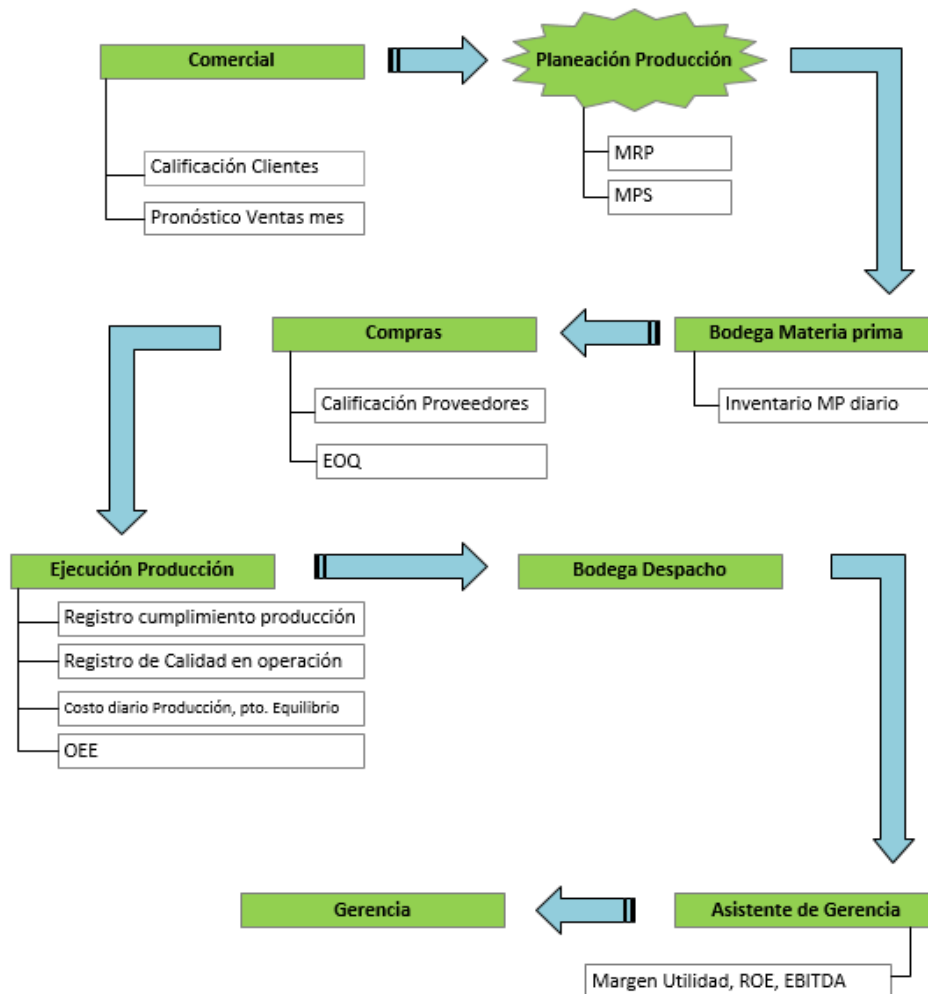


Figure 7: Flowchart of the main cycle in the implementation of the proposed Management Model. (Source: authors)

In figures 8, 9 and 10 s and details the communication methodology, that is, the interaction between positions (or areas in charge) and their demanding information, 'input', and their resulting information, 'output'. Each activity within the 'field of action' feeds another or others and, in turn, acquires information from other 'fields of action' forming a network of interaction and intercommunication.

This interaction and intercommunication can be bidirectional and are divided into two basic stages, one of preparation or 'Stage Action' and another stage of results that we will love 'Resulting Stage'. Each area in charge should organize their periodic information regarding these two stages while planning the next period ('Action Stage'), and also organizing the information to be processed and communicating about the production or order of the previous period ('Resulting Stage').

As shown in Figure 8, the area in charge, 'Implementation of Production', serves as the " emitter ", feeding information to the position 'Production Planning'; and in turn is fed back and fulfills the function of "receiver" of the information resulting from the MPS (master production plan) with ' Production Planning'.

The inputs and outputs of the 'Purchases' position are exemplified in Figure 9. Similarly, every one of the charges can be described. This also acts as an element of the description of positions and functions, and as a configuration of the company in process management (by the way, current requirement for the Icontec quality standard, ISO 9001 in Colombia).

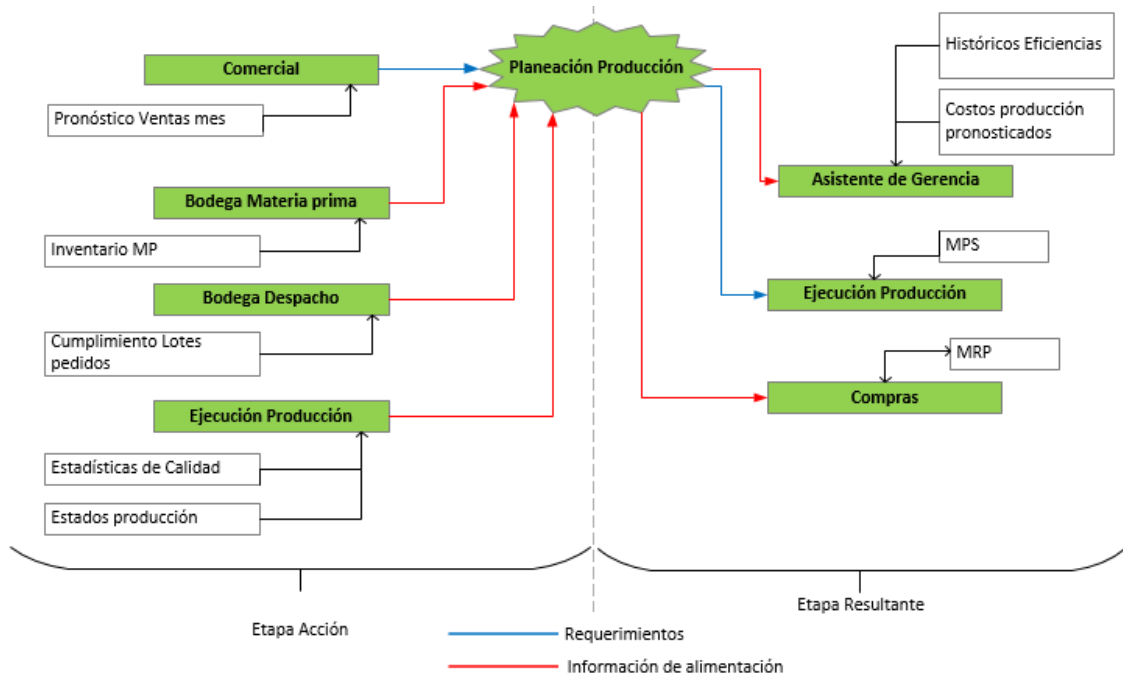


Figure 8: Interaction and intercommunication diagram for production planning. (Source: authors)

Similarly, in figure 10, the flow of information that is proposed for the production system in the company is schematized.

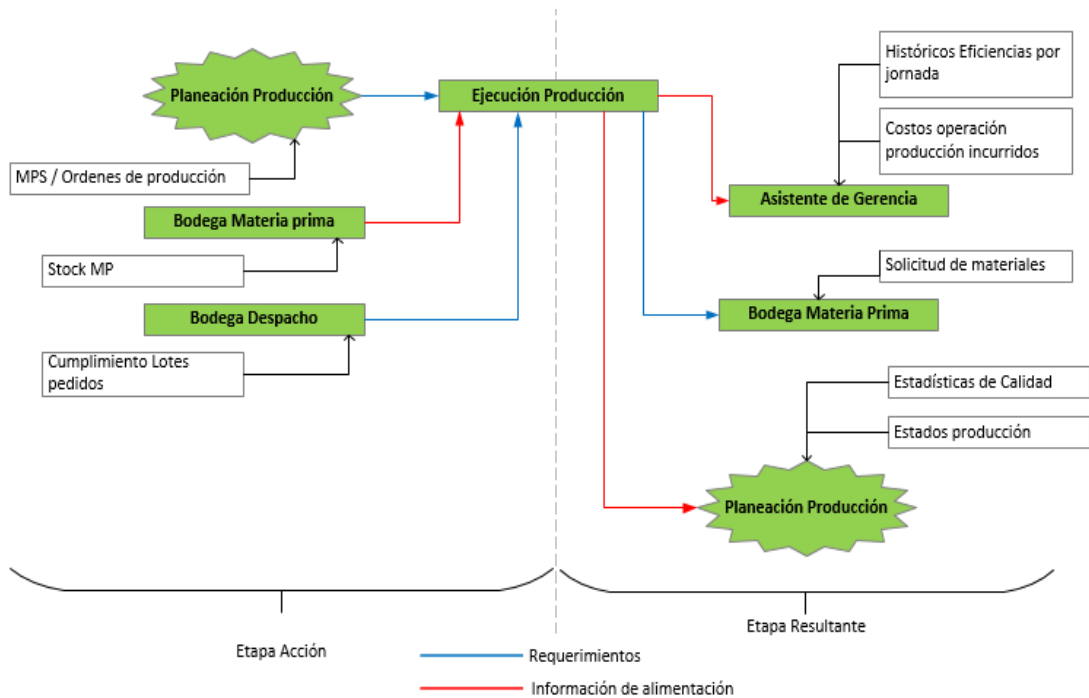


Figure 9: Diagram of interaction and intercommunication for the Purchasing system . (Source: authors)

In general, and within the proposed 'Management Model', as a mechanism for centralizing information, it is suggested that the information resulting from each of the tools or 'outputs' of each 'area in charge' must be presented under the concept of 'Visual Management', that is to say publicly on strategically located billboards and in summary form in the form of management indicators, also known as the key production indicators (KPIs) and graphically as a control board or 'dashboard'.

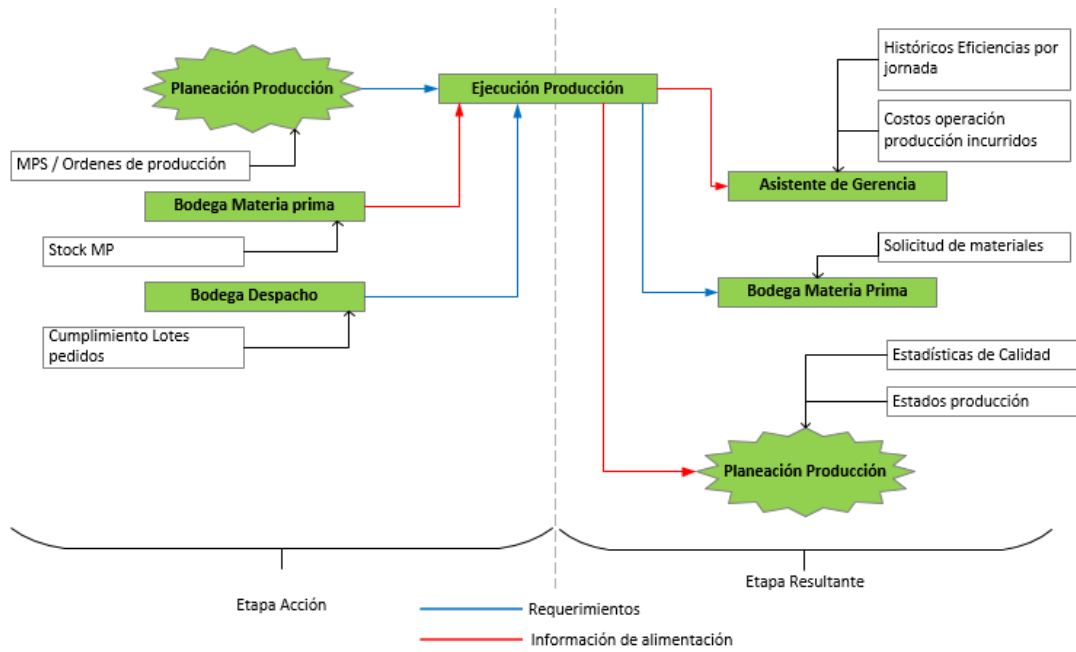


Figure 10: Interaction and intercommunication diagram for the execution of production. (Source: authors)

It should be noted the proposed office and functions of the 'Assistant Manager', c on management across the entire company in terms of managing supervising internal communications. It is suggested that this official be responsible for demanding compliance with the 'outputs' and on time, collect such information to transform it into both key indicators (KPIs) and graphically, as well as responsible for disseminating it on the respective billboards. This work is considered fundamental in the proposed management model.

5.3 Control Board, Dashboard

Each area should remove its information yields, efficiency or performance; which will be delivered, compiled and organized by the 'Assistant Management' action area. This information will help each 'area in charge', focus efforts and manage and have control over their conditions and resources, and their impact on the company.

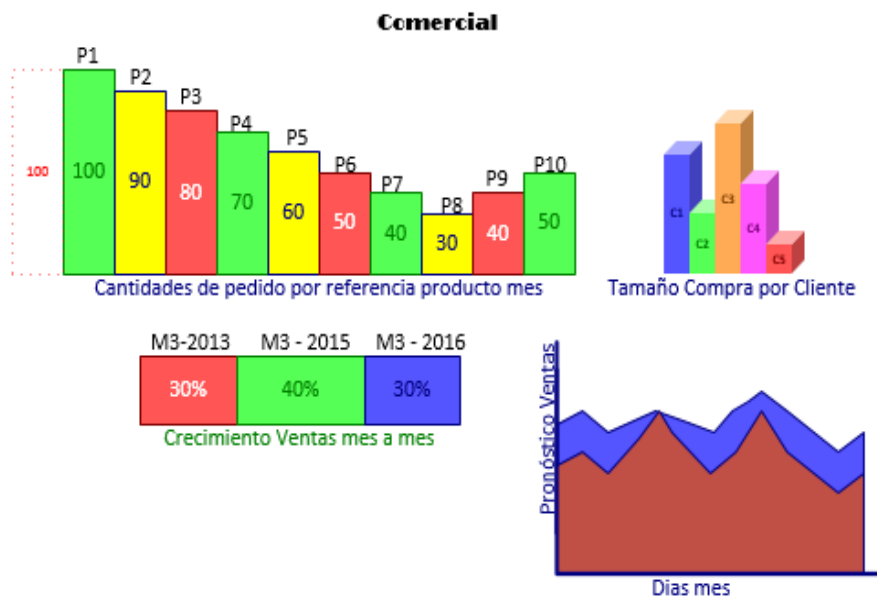


Figure 11: Example of Dashboard for the commercial area. (Source: authors)

The 'Management Assistant' (who for the current situation can be held by a single person, and to the extent of the growth requirements, by a department team), will carry the indicators of all the 'areas' (or

positions) ') as the raw material to concentrate its efforts on synchronizing the company in its mission of fulfilling customers most efficiently and profitably possible. The proposal, in this case, is to collect the relevant information in a summarized, compact and concise manner. Figures 11 and 12 show graphic examples of elements that, in this case, are incorporated into a dashboard or dashboard.

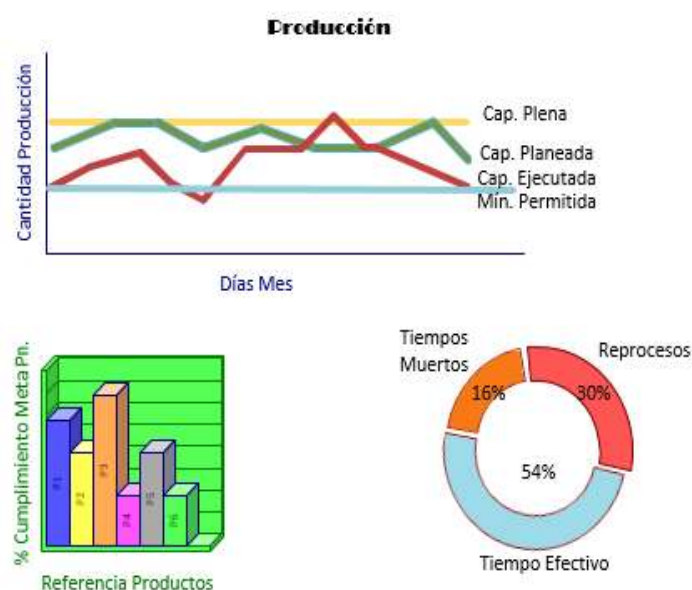


Figure 12: Example of Dashboard for the topic Production (Source: authors)

VI. MODEL VERIFICATION AND PROJECTIVE SUSTAINABILITY

Tables III, IV and V present the financial information before (four years) and after the intervention (four years); of this last period, the penultimate year is partially projected and the last period. Table 3 shows the comparison of the income statement, showing the positive and significant impact that the change caused in the profits of the business.

Table III. Income Statement previous and projected. (Source: company and authors)

	Historicos			
	2012	2013	2014	2015
INGRESOS				
VENTAS	\$ 346.889.000	\$ 451.497.000	\$ 652.332.000	\$ 1.324.000.663
ARRENDAMIENTOS	\$ 11.880.000	0	0	0
DEVOLUCIONES EN VENTAS	\$ -	\$ 20.400.000	\$ 26.884.000	\$ 2.628.900
VARIOS	\$ 792.000	\$ 12.000	\$ -	\$ -
TOTAL INGRESOS	\$ 359.561.000	\$ 471.909.000	\$ 679.216.000	\$ 1.326.629.563
(-) COSTO DE VENTAS	\$ 319.876.000	\$ 403.284.000	\$ 548.626.000	\$ 1.079.917.712
(-) UTILIDAD BRUTA	\$ 39.685.000	\$ 68.625.000	\$ 76.822.000	\$ 241.454.051
(-) GASTOS GENERALES	\$ 27.739.000	\$ 39.385.000	\$ 45.161.000	\$ 209.893.362
UTIL. ANTES DE IMPUESTOS	\$ 11.946.000	\$ 29.240.000	\$ 31.661.000	\$ 31.560.689
PROVISION IMPORRENTA	\$ 853.000	\$ 1.285.000	\$ 2.350.000	\$ 2.411.294
UTILIDAD DEL EJERCICIO	\$ 11.093.000	\$ 27.955.000	\$ 29.311.000	\$ 29.149.395

	Proyectados			
	2016	2017	2018	2019
INGRESOS				
VENTAS	\$ 1.668.626.596	\$ 2.079.853.689	\$ 2.521.309.146	\$ 2.994.761.873
ARRENDAMIENTOS	0	0	0	0
DEVOLUCIONES EN VENTAS	\$ 16.686.266	\$ 20.798.537	\$ 25.213.091	\$ 29.947.619
VARIOS	\$ 1.000.000	\$ 1.000.000	\$ 1.000.000	\$ 1.000.000
TOTAL INGRESOS	\$ 1.686.312.862	\$ 2.101.652.226	\$ 2.547.522.238	\$ 3.025.709.492
(-) COSTO DE VENTAS	\$ 1.294.606.695	\$ 1.530.331.906	\$ 1.753.762.511	\$ 1.971.442.514
(-) UTILIDAD BRUTA	\$ 391.706.167	\$ 571.320.319	\$ 793.759.726	\$ 1.054.266.978
(-) GASTOS GENERALES	\$ 218.604.362	\$ 273.828.271	\$ 329.052.179	\$ 384.276.088
UTIL. ANTES DE IMPUESTOS	\$ 173.101.805	\$ 297.492.049	\$ 464.707.547	\$ 669.990.890
PROVISION IMPONETA	\$ 43.250.000	\$ 84.299.000	\$ 139.480.000	\$ 221.480.000
UTILIDAD DEL EJERCICIO	\$ 129.851.805	\$ 213.193.049	\$ 325.227.547	\$ 448.510.890

Similarly, in table 4 the balance sheet shows stabilization of the company's assets while significant growth in equity. Consequently, Table 5 shows the excellent results of financial indicators for the improvement period, compared to the historical company case study 'Calzado Caleño'.

Table IV. Balance Sheet with projection. (Source: company and authors)

	Historicos			
	2012	2013	2014	2015
Activos Corrientes	\$ 182.688.000	\$ 274.636.000	\$ 229.986.000	\$ 621.725.569
Activos No corrientes	\$ 320.544.000	\$ 294.424.000	\$ 318.835.000	\$ 528.236.641
Total Activos	\$ 503.232.000	\$ 569.060.000	\$ 548.821.000	\$ 1.149.962.210
Pasivos Largo Plazo	\$ 91.690.000	\$ -	\$ -	\$ -
Pasivos Corrientes	\$ 97.107.000	\$ 138.769.000	\$ 129.639.000	\$ 765.313.160
Total pasivos	\$ 188.797.000	\$ 138.769.000	\$ 129.639.000	\$ 765.313.160
Capital	\$ 400.449.000	\$ 402.934.000	\$ 390.469.000	\$ 355.499.655
Utilidad del ejercicio	\$ 11.093.000	\$ 27.357.000	\$ 28.713.000	\$ 29.149.395
Total patrimonio	\$ 411.542.000	\$ 430.291.000	\$ 419.182.000	\$ 384.649.050

	Proyectados			
	2016	2017	2018	2019
Activos Corrientes	\$ 599.658.492	\$ 726.904.762	\$ 854.151.033	\$ 981.397.304
Activos No corrientes	\$ 120.106.781	\$ 184.855.674	\$ 249.604.566	\$ 314.353.458
Total Activos	\$ 719.765.273	\$ 911.760.436	\$ 1.103.755.599	\$ 1.295.750.762
Pasivos Largo Plazo	\$ -	\$ -	\$ -	\$ -
Pasivos Corrientes	\$ 749.154.398	\$ 948.703.246	\$ 1.148.252.094	\$ 1.347.800.942
Total pasivos	\$ 749.154.398	\$ 948.703.246	\$ 1.148.252.094	\$ 1.347.800.942
Capital	\$ 589.913.468	\$ 698.567.387	\$ 778.528.051	\$ 847.239.872
Utilidad del ejercicio	\$ 129.851.805	\$ 213.193.049	\$ 325.227.547	\$ 448.510.890
Total patrimonio	\$ 719.765.273	\$ 911.760.436	\$ 1.103.755.598	\$ 1.295.750.762

As shown in the comparative tables of financial indicators (Table 5), these improvements operation substantially as a result of the implementation of the management model of operations, and this without incurring go into any additional infrastructure investment or organizational (team, staff, software), only the organization of the human resource and its communications network. It should be noted here that plant capacity or OEE (indicated r of availability and overall performance of plant) enc or NTRA BA level low, thereby allowing for the management model proposed additional investment, in practice.

Table V. Indicates previous and subsequent financial matters. (Source: the authors)

Indicadores financieros	ACTUAL			
	2012	2013	2014	2015
ROI	3,4%	6,6%	5,3%	2,4%
ROA	2,2%	4,8%	5,2%	2,5%
ROE	2,8%	6,8%	7,4%	8,2%
EBIT	\$ 11.946.000	\$ 29.240.000	\$ 31.661.000	\$ 48.576.847
EBITDA	\$ 11.946.000	\$ 29.838.000	\$ 32.259.000	\$ 65.593.005
EVA	-\$ 36.032.431	-\$ 27.312.106	-\$ 24.213.462	-\$ 76.413.169

Indicadores financieros	PROYECCION			
	2016	2017	2018	2019
ROI	11%	16%	22%	28%
ROA	18%	23%	29%	35%
ROE	22%	31%	42%	53%
EBIT	\$ 128.101.805	\$ 264.492.049	\$ 439.707.547	\$ 654.990.890
EBITDA	\$ 218.101.805	\$ 330.492.049	\$ 489.707.547	\$ 684.990.890
EVA	\$ 45.999.151	\$ 109.708.239	\$ 203.262.554	\$ 289.781.422

VII. CONCLUSIONS AND FINAL COMMENTS

The case provides evidence empirical in the sense that the limits of growth and failures PY ME s are caused, mainly, by the way, information managers govern the operation of your company. Its operational management model has deficiencies or inadequacies in planning, forecasting, and communication.

The extended hierarchical organization or 'cacicazgo' in SMEs, does not contribute to the efficient management of large volumes of information, analysis, and attention to problems.

Inappropriate management of demand management can cause depleted product or an over-stock in storage, for a small company such as 'Calzado Caleño', it impacts the profitability of the business and its cash flow generating a high negative influence and probably its liquidation.

The majority of SMEs in Colombia do not have an ERP system or some effective tool for the MRP, therefore, their control and inventory management can become one of the critical activities that trigger the majority of operational problems, and therefore, practically define the profitability of the company.

The SME 'Calzado Caleño' as well as the other manufacturing SMEs in Cali, do not handle a record of operational problems or efficiency measurements. And if these do not carry management indicators or KPIs, they cannot have adequate management.

Production planning is presented as one of the most relevant activities for the operational management model, it centralizes and distributes the largest operational information of the company. This vital field of aggregate action is usually found as one more activity of some global production manager when it should be separated as a job of full occupation, and focused and specialized work.

In this case of 'Calzado Caleño' the raw material costs 80% of manufacturing costs, as is the case with most manufacturing SMEs. Then, the purchasing area consequently plays an important role in the efficiency and competitiveness in the costs of the final product.

The purchasing function, in its mission to supply, is essential for the production and the more efficient it will directly impact on efficiency and operational competitiveness. It then has an important responsibility both in production costs and in not delaying production.

The demand forecasting tool is found as a powerful tactical resource that will allow the development of comprehensive planning of operations and budget.

The criteria of forecasting, control, planning, and communication are identified as pillars of the management model proposed here.

An operational management model has been proposed that an SME can easily implement, in which the methods of communication and synchronization between the operational areas are as or more important than the same incoming techniques.

It is normal to find in the growing manufacturing SMEs that the efficiency indicators for plant use are low, which facilitates their optimization with soft methodology, that is, without incurring large investments.

The shift towards the competitiveness and productivity of a manufacturing company, and especially SMEs, must come from a strategic map established from the management side of the company. It is necessary that the general manager understands, manages and knows how to analyze the financial indicators (ROI, ROE, ROA, EBIT, EBITDA, EVA, Profit Margin, Working Capital and Leverage) that will be part of the appropriate and timely decision making in addition to Readjust the strategy that should govern the company.

The tools of monitoring and control of both quality and performance, in addition to all fields of action, will serve to provide an overview of the integral state of the company's operations, serving this for the forecasting aspect within the operational management model.

Starting from the tools that somehow exist in the literature, a combination of them has been proposed in a model that necessarily improves the planning, measurement, and control of operations. Consequently, generating greater capacity for productivity, response and / or sales with the same resource base and infrastructure costs, which is evidenced in the favorable impact on the financial results of the company.

Although the literature does not directly establish a customized operational management model for a specific type of organization SMEs, the criteria mentioned above have not been found in compiled form in the researched literature or as an integral solution to the documented problem, suggesting that the solution presented here is a new contribution to the frontiers of knowledge on this subject.

It stands out, as a general procedure approach to situations of SMEs growing to manufacture, the three-stage approach. The first, a causal analysis; the second, the concrete development of the management model-based, fundamentally, on the administration of the information, the third a real quantification (if time permits) or projective of the changes obtained with the application of the proposed model.

The model proposed operational management should be complemented with policies, delivery of results, deadlines, protocols, contingency measures, coordination meetings, and communication visual on the alignments of strategies or management decisions resulting.

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