

PLANNING AND CONTROL OF PRODUCTION IN MICRO AND SMALL ENTERPRISES - A METHODOLOGY FOR DEPLOYMENT

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***Abstract.** Although the subject of Production Planning and Control (PPC) is the subject of many studies and research when it comes to micro and small enterprises (MSEs) and even medium-sized enterprises, especially there is still much to learn. The focus of the subject usually lies in computer systems (software), its use and applications. It is noticed that the little emphasis is given to the prerequisites for proper operation of these systems, namely the deployment of so-called practical improvements and systematization of the manufacturing environment to receive such computational tools, or even dismiss them early. The purpose of this paper is to optimize the production planning and control of micro and small businesses by increasing the efficiency of micro and small enterprises; reducing costs, and finally, gradually decrease the workforce. The method used was based on a data processing through literature reviews were selected articles and stories published in magazines on the subject. This material was analyzed and subsequently reported to the information obtained during the search and that were related to the importance of PCP in small and medium enterprises. Later there was an analysis of data where the materials were selected that had content related to the subject, which had some scientific background, research with significant number of analyzes. The results are provided in advance to improve the income can control the production of micro and small businesses, making you fall to the mortality rate of micro and small enterprises.*

Keywords: Small enterprises; PCP; methodology

1. INTRODUCTION

Even the matter of Production Planning and Control (PPC) is the object of many studies and research when it comes to micro and small enterprises (MSEs) and even medium-sized enterprises, especially there is still a lot to study. The focus of the subject usually lies in computer systems (software), its use and applications. It is noticed that the little emphasis is given to the prerequisites for proper operation of these systems, namely the deployment of so-called practical improvements and systematization of the manufacturing environment to receive such computational tools, or even dismiss them early.

It is often wrongly confuse the concept of flexibility with which usually extends for small businesses. Despite the relative appearance that the small business is inherently more flexible than a large company, the lower complexity of its structure, the flexibility that is needed only really appears when you have to introduce other factors. Many micro and small enterprises (MSEs) arise primarily from core family, but as they grow and develop, there is the need for such fast breaking family ties and build a culture of more professional management.

According Suzigan (1989), the transition to a new growth pattern and a "new technological trajectory", accelerated from 1977-78 with the development of new technologies, products and manufacturing processes. Micro and small enterprises grow in importance every day in the economic scenario in Brazil. As Dolabela (1999), micro, small and medium enterprises are important agents of development communicators. These companies account for about 50% of private jobs in the world and in Brazil, accounting for about 98% of establishments and 80% of jobs. Second Battle and Demori (1990) the MSE is of paramount importance for the survival of the country's economy by presenting various aspects such as: hand labor absorbing, number of companies totaling participation of national GDP, participation in the wage bill, training of a skilled workforce, among others.

According to Cher (1991), the peculiarities and problems of micro and small enterprises, mentioned as responsible for his death are many, and highlighted the following: lack of instruments of administration, lack of financial resources, lack of experience in the field of business competition, lack of discipline, responsibility and organization. So how can we tailor the planning and control of production to better contribute a micro or small business? How much such improvement? In view of the above, the research topic is to improve the planning and control of production in micro and small enterprises through the implementation of a methodology.

This article aims to optimize the overall planning and control of production of micro and small enterprises. The specific objectives are to increase the efficiency of micro and small businesses, reduce costs, and finally, gradually decrease the number of employees. The planning and controlling activities related companies that produce standardized products to stock is very different to plan and control a custom product.

In a very broad, the activities related to planning and control of production are simplified as they will be reducing the variety of products competing for the same range of features. Finally, the fact that a service or product and also has its reflection in the complexity of the planning and production control. Although these claims seem rather obvious, sometimes they are not fully aware of all companies. Learning what is the PPC, including their characteristics and their impact on the manufacturing environment is of paramount importance for any company, especially when it is a micro or small and does not have specialized personnel to this activity.

The idea is to structure the work activities of the PPC since its implementation using a methodology with ten basic steps to facilitate understanding. The following is presented in this article present a comprehensive literature review, the method followed, the final considerations, and finally, the references that were the basis for the article.

2. LITERATURE REVIEW

This session will discuss topics such as the micro and small business and its importance relative to production planning and control (PPC) with micro and small companies and approach of a method with 10 steps that were used to control and optimize the production planning of micro and small enterprises.

2.1 The Micro and Small Enterprise and Its Importance

Micro and small enterprises (MSEs) have a critical role to boost the country's growth, according to an analysis of the National Bank for Economic and Social Development (BNDES). According to data of the institution, small businesses were elementary importance to foster the development and contribute to the advancement of Brazil in 2010.

The MSE have higher (above 97%) representation than medium and large companies in senary Brazilian accounting for 51% of the workforce. The MSE accounted for 70.9% of the 299 415 000 formal jobs in the month of August 2010.

These companies maintain the performance of the largest employment generators in the country (SEBRAE). The size of establishments is classified by the number of persons employed and depends on economic activity. The criteria for classification of establishments according to their size was defined SEBRAE via text: "Note on Methodology for the Definition of Numbers Basic MPE". As the table below.

Table 1: Classification of establishments according to their size

Porte	Sectors	
	Industry ⁽¹⁾	Retail & Services ⁽²⁾
Microenterprise	up to 19 employees	up to 9 persons employed
Small business	20-99 employed persons	10-49 persons employed
Average company	100-499 people employed	50-99 persons employed
Great company	500 employees or more	100 or more persons employed

Source: SEBRAE. Yearbook of the work of micro and small enterprises. Adapted by author

Preparation: DIEESE

⁽¹⁾ The boundaries of the same size were used for the construction sector

⁽²⁾ The service sector does not include public administration and domestic service

According Bortoli Neto, 1980 (cited in Andrade, JH, 2007) has highlighted that small businesses are essential and indispensable in the developed economies and developing countries.

2.2 Relationship Planning and Production Control (PPC) to Micro and Small Enterprises

To get a notion of the "state of the art" in the world as regards the relationship PPC micro and small businesses, we performed a search for fresh material (in the database of the International Association of Libraries), where they crossed the PPC and small business matters. In the last five years have been found, only 20 publications (very little when it comes to the world) that somehow related to the subject PPC micro and small company, but still some of these studies did not specifically address the issue of interest.

According to Barros Filho, (2005) when they find articles on planning and control of production, typically the articles refer to software PPC. Still, it is clearly noticed that there is already a predisposition on the part of MSEs to adopt "tools" that give greater firepower against competition within a turbulent environment in which they operate.

The reasons for the MSE adopt any new technology, such as the so called "Advanced Technologies in Manufacturing", are the most diverse, where we can highlight the following: a reduction in the time of product development (time to market), economy of skilled manpower, material savings, need to resume competitiveness, fiscal incentives, availability of funding, the need for flexibility in the products, regulations / concerns with environmental, health and safety, increased profitability or performance and the diverse needs customer. (Mechling et al. 1995)

2.3 Methodology for the Implementation of the CFP in Small Business

As Lakatos and Marconi (2005), the method "is the set of activities that systematic and rational, with greater safety and economy, will achieve the goal, tracing the path to be followed by detecting errors and aiding decisions on research."

Barros Filho and Tubino (1998) formulated a sequence of ten steps, organized into: training and learning; definition of a system. Even while still in the testing phase, the initiative seeks to improve a key issue to the performance of these organizations: planning and control of production processes. Therefore, the following procedures are presented that seek to contribute to the methodology supplied by the authors with the establishment of parameters the opportunity for a more in-depth guidance to the exact improvement actions.

In this definition, we present a formalized guidance on a plan with actions to implement the PPC in micro and small enterprises. Depending on the specificities and needs, some phases may then be adopted and implemented independently, however, the sequence of steps is presented as a way to reduce or even eliminate barriers and difficulties in implementing the system and its stability in the company culture.

2.3.1 Definition Team

Choosing appropriately the group will implement the change process is essential in order to have success in the project. The presence of those responsible for directing the company within this group is extremely important, because if the project does not have support from the highest level that runs the company, failure tends to occur.

2.3.2 Sensitization

At this point every step of the procedure must be under knowledge of all involved, followed by the assembly of a timeline for the development of actions foreseen in the methodology. One of the best ways perhaps aware of the high level of corporate governance is the old story of the survival of the company, which in simpler words mean "making money" to remain on the market.

2.3.3 Alignment of Knowledge

All the people who will be involved somehow in the process, directly or indirectly, must know very well the subject PPC. The people who will be involved in the change process will involve only if they know what they are actually getting. It is at this stage that presents itself in the form of training, an overview of the types of production system, its features and its classification. Knowing how production systems are classified is very important to understand their characteristics and their relation to the complexity of the activities required for the planning and control of such systems.

Second Tubino (1997) production systems can be classified in three ways:

1. The degree of standardization of products;
2. By the type of operations;
3. Due to the nature of the product;

2.3.4 Characterization of Type Production System

The starting point for characterizing the type of production system is its setting within one of the categories that were listed earlier. The degree of standardization of products, the type of operations to be performed IRAM and the nature of the products are factors that will be decisive for the definitions of the activities of the PPC.

2.3.5 Special Conditions Productive System

The diagnosis of the basic characteristics process is extremely important, but it is necessary to go beyond. It is necessary to analyze the company by looking at the environment in which it is embedded. This is where they exchange experiences. We must unite with the vision of manufacturing market overview. Everyone should know where they want to reach and who they are.

2.3.6 Information Survey and Analysis of Current System

After performed the classification and analysis of the type of production system should establish a kind of checklist for the analysis of current production. The ideal is to use as the basis for the elaboration of the checklist information flow or macro mapping company processes. Already in possession of the problems, these should be classified into two types: those that relate to the PPC and that do not relate. Those that do not relate to the CPC will be forwarded to the company's management to act on them as you wish, since the problems are related should be analyzed.

For an analysis is suggested survey information, which can be connected in information about:

1. Information system;
2. Lead time service;
3. Structure of the products;
4. Machines and processes;
5. Layout;
6. Bottlenecks in production;
7. Hand-to-work;
8. Maintenance;
9. Suppliers;

Through an analysis of this information the company's problems tend to be lighter and thus can make a list of the different classes of problems raised.

2.3.7 Simplification and Systematization of Activities

At the beginning of this step is necessary to know what is priority. According to Harmon (1991 and 1992) in his two classic books: Reinventing Reinventing the Factory I and Factory II has a good idea how a company can become a reference in an economical way. Highlights three types of simplification: simplifying the flow of activities in the product and in the factory.

2.3.8 Definition and Specification of Requirements for a System of PPC

At this stage it is essential to know the reason for the company to choose a system that manages its production. The study Hansall (Hansall et al., 1994) left some important conclusions.

1. Helps the company to gain competitive advantage;
2. Helps the company to obtain cost advantages;
3. Improves the company's image;
4. Assists the company forward to competitive threats;

If the company is convinced of the importance and are ready for adoption from support systems, the first issue to be worked is the following: the technique is best suited to the production system of the company? The company should be able to answer that question at this stage.

So be adopted MRP, OPT, JIT, or even a hybrid system? The system should help the company to manage what it is fundamental from the point of view of their business strategy. This point is defined the scope of the system in the environment of the company, their priorities and characteristics.

2.3.9 Selection and System Development

Use or not use computer packages? Build or buy? If you decide to build, develop internally or externally? These issues certainly will be present at this stage. It is consistent to think today that the decision to purchase a computer package is only a matter of time. The need will arise when the company is losing ground in the competition for not using computer packages or by using old packages. The way used in micro and small businesses to choose a system is to know what your competitors are using, and then check if there is any other solution in the region that works well or best fits the needs of the company.

2.3.10 System Implementation

The solution set, the next step is to implement the system. Since the process is already maturing, with the participation of all, this step can be very well considered the easiest, but it is extremely important and somewhat time consuming. The implementation process requires great care as a new work system is being started. The last and principal of this process is the inclusion of PPC in a cycle of continuous improvement.

3. METHODOLOGY

What is scientific methodology? According to Barros (2006) "is a set of procedures to be used in obtaining knowledge. It is the application of the method, through processes and techniques, which ensures the scientific legitimacy of knowledge gained. "

According to Oliveira (2003), scientific research aims to contribute to the construction of human knowledge in all areas of pure science or applied mathematics or agriculture, technology and literature. According to the author we classify the research considering your goals:

Exploratory research establishes criteria, methods and techniques for the development of a research and aims to provide information on this subject and guide the formulation of hypotheses. "Descriptive Research: "Study, analysis,

recording and interpretation of the facts of the physical world without interference from the researcher. The purpose is to observe, record and analyze the phenomena or technical systems, without, however, entering into the merits of content. "Explanatory research: "Logs facts, analyzes them, interpret them and identify their causes. This practice aims to expand generalizations, set wider laws, structure and set theoretical models, hypotheses relate in a more unitary view of the universe or the productive sector in general and generate hypotheses or ideas by virtue of logical deduction.

Andrade (2010), says that when the man began to wonder about the facts of the external world, culture and nature, the need arose for a methodology of scientific research "methodology is a set of methods or paths that are traversed the pursuit of knowledge". According to Ruiz (2008), we can classify scientific methods in:

Rational method, deductive thinking is when, from more general statements arranged neatly as premises of an argument, reaches a particular conclusion or less general. "Inductive Method, "induction is a process of backward reasoning to deductive process, while deducting part of more general statements to conclude particular or less general induction walks registry singular facts or less general to conclude unfolded or expanded into a more general statement. Another scientific method is the hypothetical-deductive method, which according to Andrade (2010), is considered logical par excellence, finds itself historically related to the trial. This article aims to optimize the design of production control of micro and small enterprises. Secondary objectives presented in this work is to increase the efficiency of micro and small businesses, reduce costs, and finally, gradually decrease the number of employees.

The type of research conducted for the development of this work was initially developed a literature search of scientific articles published in magazines, journals and conference proceedings of the study area and known authors books that address the topic of research, with the aim of collect and gather information. Subsequently, we performed an exploratory study.

According to Lakatos and Marconi (2005), "the whole bibliography covers literature already published about the study and in order to put the researcher in direct contact with all that has been said about a certain subject."

This article followed the following steps:

Data processing: through literature reviews selected articles and stories published in magazines on the subject. This material was analyzed and subsequently reported to the information obtained during the search and were related to the importance of PCP in small and medium enterprises.

Data analysis: we selected the materials that had content related to the subject, which had some scientific background, research with significant number of analyzes.

All data presented in this paper are the authors of articles cited in the references; final section.

4. RESULTS AND DISCUSSIONS

This study has helped further our understanding of the micro and small enterprises, mainly on planning and control of production and method of implementation of PPC in small businesses.

We note that the importance of MSE has a fundamental role to tilt the growth of the country, either directly or indirectly. From the literature review we realize that these companies have fostered the development and growth of Brazil accounting for over 70% of jobs with a formal signing in 2010, maintaining the performance of the largest generators of employment in the country. Companies with up to 19 employees (industry) and up to 9 persons employed (trade and services) are classified as micro and 22 to 99 employees (industry) and 10 to 49 employees (trade and services) are classified as small company. After this foundation, we note that the micro and small enterprises are essential and indispensable in developing economies.

Planning and control of production (PPC) noticed that a few recent work with the intersection of PPC with MSE were published, typically the articles refer to software PPC since it is notorious companies to invest in tools that give greater competitiveness with competitors . By applying these tools is reducing product development time, fewer people involved in the same activity, greater flexibility of products meeting the needs of customers and thus increasing the company's profitability.

Regarding the inclusion of the implementation methodology of PPC in micro and small enterprises raises questions regarding the functionalization of the same. For the steps outlined are recent and are being implemented in some pilot so MSE. In the literature most of the problems in the implementation of PPC systems that befall people, based on early results that little or no attention is paid to the initial stages of the change process. Other factors not analyzed in this work proved to be of greater impact on performance, for example, the action of competition and the availability of short-term funds in cash.

With the extreme competitiveness that is imposed on productive means for the global economy both large and small and micro enterprises are fighting for the same market often this struggle is extremely uneven given the financial and technical conditions to reach some and not others.

It is observed that the proposed methodology considers essential premises as knowledge of the culture and existing power sources, but recognizes the need for change at different levels, in the context of flexibility and appropriateness.

5. FINAL CONSIDERATIONS

With this research, we highlight the issue of micro and small companies in the commercial sector in our country, which represent the vast majority of domestic firms and therefore greater representation in terms of quantity of employees. We conclude that the main problem faced by these companies is the lack of planning during the execution of their activities.

The objectives were achieved by what is proposed in the article, where it was exposed clearly the best performance possible from the control of the production of micro and small enterprises and thus increasing the efficiency of the MSEs, reducing costs to reach the gradual reduction of staff .

Critically analyzing this literature review we noted that we should have done a more comprehensive view of the subject, because it was all cleared up but so focused on goals and not the theme.

A contribution to this study is the fact that it presented a methodology of implementation of PPC in small companies building on the existing system.

Because of the peculiarities and limitations of their own, this work leaves open some questions that can be developed in other studies. The main one is related to the proof of the influence of the entrepreneur or not the results obtained by quality programs deployed in small businesses.

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