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Abstract Title: **Control the production of bread: a case study of bakeries in Sao Paulo, Brazil**

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## **Control of bread production: a case study of bakeries in Sao Paulo, Brazil**

### **1. Summary**

This paper shows the main techniques and systems of Planning and Production Control used in bakeries, strategies, concepts and issues that cause more difficulty in their production processes and suggests tools and systems that can be used by managers of bakeries in their planning and control of production. The research methodology is exploratory, based on a questionnaire with closed questions applied to managers of companies that produce bread with qualitative and quantitative results which made it possible to identify if these companies control their product production and to propose solutions to improve the process.

**Keywords:** Management of bakery, production of bread, quality of production, training of workforce

### **2. Introduction**

Even with the evolution of mankind there was no change in the principle of bread production, which is made from a mixture of wheat flour, salt and water, and an oven. However, the process has improved because of the demand of production and necessary speed to meet the growing population and its increasing need for more food. Thus, we need new technologies, new products and processes, systems and techniques that allow different initiatives for competitive industrial companies to meet the growing demand of the market (Lage Junior, 2006).

The production planning and control is recognized as an administrative function, and aims to formalize a plan in order to direct the production sector accurately. The intention is to schedule tasks to produce the desired item, and for this it is used a control that redirects the output if any shift of focus by the employees or even interference from something unusual as a change of plans happens (Machline et al. 1990).

The production system and control can be applied to any product or service in its production process so that the result of the production system is efficient and

dynamic, with results that can meet the market demand both in quantity and quality. In this sense, the production of bread is the case study of this article, which tried to identify the production process and production control system that exist in some bakeries in the selected region of the Capao Redondo, which is a district in the city of Sao Paulo – Brazil.

Some concepts were then raised and they are defined in the chapters that follow. Tools and systems are presented to promote the organization of data within the bakeries, and thus to provide a better understanding of stock data, in a quick and clear way and their respective function in the bakeries.

### **3. Literature review or Theory review**

The revolution of the production system can be summed up in great landmarks of our not too distant history to facilitate understanding of this article. The production function is a set of activities that appeared when prehistoric man had the idea to create a commodity through the transformation of an object. (MARTINS & LAUGENI, 2006). These activities worked like this: the man began the process of polishing the stone and then turned it into a useful object. In this process, the one who handled the tools was producing it to use it and not for the marketing of it.

The industrial revolution occurred around 1700 when production ceases to be handcrafted to become industrial as machines are invented. Over time, individuals were becoming more skilled regarding production, thus drawing the attention of people who understood the relevance of the product. As time went by, these skilled men started building products according to the demands of others, becoming craftsmen. They managed organized production and were setting deadlines for deliveries in accordance with the priorities, the products were delivered according to customer requirements, and they imposed reasonable prices for each product.

Over time some hiring was necessary and it was then that new talents arose, because of the interest in learning the profession. However, because they were beginners, they worked in the lower precision cuts, and over time they became more skilled, going from simple apprentices to talented craftsmen. Because of the Industrial Revolution there was a decline in craft production. "With the discovery of the steam engine by James Watt in 1764, the process of replacement of human power by machine force took place" (MARTINS & LAUGENI, 2006, p. 2).

In the thirteenth and fourteenth centuries new machines modernized production, different sizes of plants, along with the workers' demands for human rights in relation to working conditions and changes in rural and urban areas became current issues (Moreira , 2004).

Until then, the text emphasizes that since the beginning, human being proves to have differentiated intellect. This was due to their unique ability, creativity and performance of tasks mainly on the ones that require accuracy to promote the fulfillment of the ideals until we come to the current mass production.

During the First World War, bigger volumes of production were demanded to meet the growing need for products of war and general consumer population. The process of scientific management appears with the contribution of great characters of the administration theory as Taylor and Ford, responsible for establishing processes and speed in production. A major concern that Taylor has and the companies still have today is to understand new work techniques and a more dynamic and flexible production process. This means that Taylor was concerned with getting better productivity with lower costs. Today, organizations have the same conception but the difference is the method.

Henry Ford had the great idea of mass production in 1910, thus standardizing products, aiming at a minimal difference in the final product. The term Industrial Engineering emerged because of the constant search for systematization of production.

After passing through operational research proposing mathematical models to improve the dynamic and save elements in the production process, the production system had a contribution of the service revolution that included the need for effective controls on production processes to generate customer satisfaction.

Until 1960 this idea was successful, but soon new production techniques started, such as *Just-in-time* (JIT), concurrent engineering, group technology, modular consortium, cellular manufacturing, quality function deployment, *comakership*, flexible manufacturing systems, computer integrated manufacturing, *benchmarking* among others. (MARTINS & LAUGENI, 2006).

### **3.1 History of the Bakery and Confectionery in Brazil**

With people moving from rural to urban areas, the expansion of wheat started worldwide, and especially in the 1950s the industry decided to give the same emphasis on industrialization, thereby strengthening the consumer's desire (SENAI , 2008). Until 1989 the shops were simple, with little investment in sophistication. Things such as requests were recorded in books. Since 1990 the shops have changed not only in structure, but also in the way to approach and gain customers.

It is possible to notice the preferences of Brazilian people for bakery products and for that reason there was a growth in this segment, making customers more demanding; because of this, companies tended to increase investments in French roll bakeries. With the market growth of the bakeries, competitors interpreted that expanding the business was viable and then bakeries were implanted within their marketing niche (SEBRAE, 2009).

Bakeries changed their views and strategies, selling not only bread but also candies, cakes, drinks and different types of food; they operated with many products to become more attractive to consumers. With so many changes, the laws also became stricter in order to control hygiene and health care.

## **4. Research methodology**

This article aims to identify the main techniques and systems of Production Planning and Control – PCP, used in bakeries, specifically in the region of Capao Redondo, which is a neighborhood in the southern region of the city of Sao Paulo. It also checks the aspects that cause difficulties in their production processes and suggests tools and systems that can be used by managers of bakeries in their planning and production control. A sample of 25 managers of bakeries answered a questionnaire with 25 closed questions.

It was necessary a study of the bakeries in the Capon Redondo and neighboring areas for the data collection and their interpretation to address the doubts. The intention behind the data acquisition was to contribute to the improvement of bakeries and clarification of the strategies, methods and tools that brings them advantages or disadvantages.

The organizations that aim to expand their business and become a large company need techniques that make them more competitive. Such techniques require

a good plan, so that the company stays organized through an efficient programming (Poza, 2008). A plan not always develops as proposed, and therefore it is necessary to build a production control to compare the plan with the outcome. The production control will try to identify factors that could affect production directly or indirectly, thereby enabling corrective action that best fits the problem.

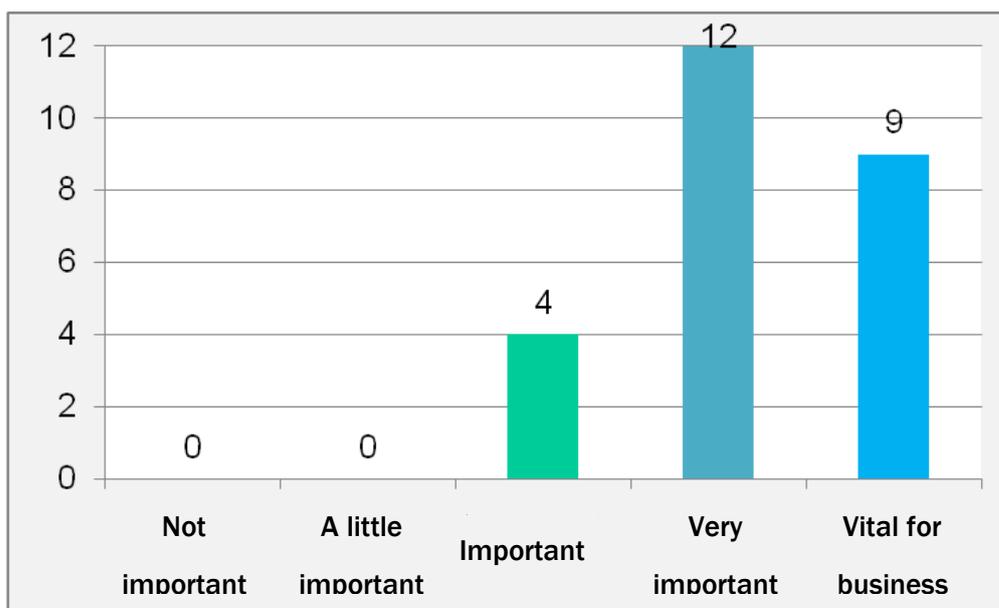
To achieve the goals, it is required to organize the data and tasks. The manager should formalize the processes within an organization to keep track of inventory and production. Among many problems that afflict organizations, waste is a major one and the *Just-in-time* – JIT – philosophy was created aiming at the resolution of this and other problems. This philosophy is characterized by the elimination of downtime that may occur due to delay of suppliers, machine breakdowns and problems such as lack of quality and inventory waste.

Small businesses usually have some deficiency in their production systems and in the case of the organizations that this work intends to study, this fact is likely to occur. This perspective is based not only on the fact that such organizations are present in the outskirts of a large city, but also because according to surveys of the Brazilian Service to Support Micro and Small Enterprises - SEBRAE, small organizations have shortcomings in their planning that can often bring them to closure. Thus, the bakeries of Capao Redondo and neighboring areas probably have many aspects that can be improved in terms of management.

## **5. Result analysis**

After 25 managers of bakeries filled in the questionnaire with 25 questions, data was analyzed and the most relevant results are described in this article.

The first aspect investigated was the perception of production managers as for planning. The graph below illustrates the answers.

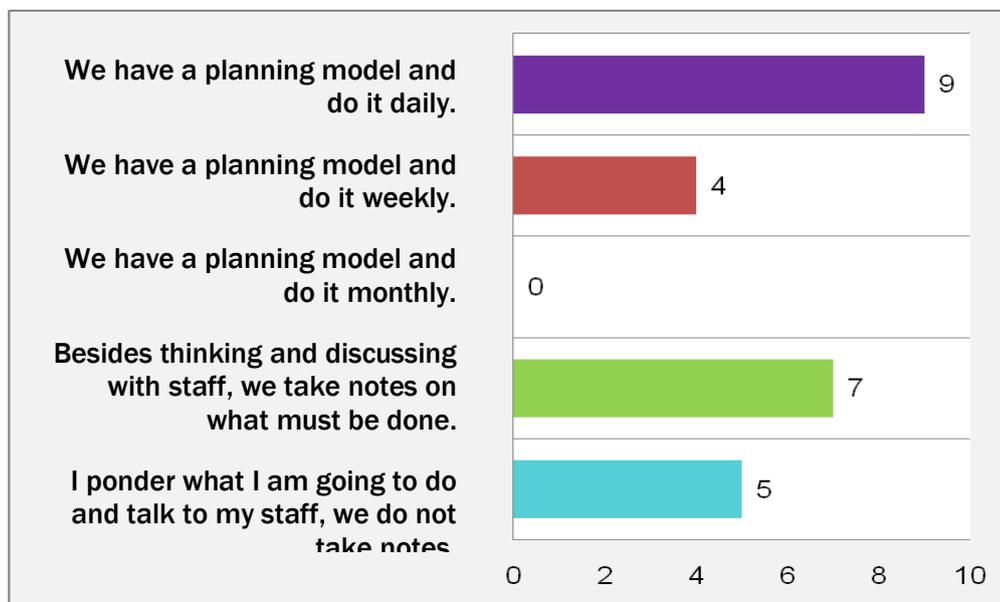


Graph1: Degree of importance for the planning on bakeries.

Source: the authors

According to Graph 1, all 25 respondents listed planning as an instrument of importance, and 12 of them see planning as very important.

The second question looks into the understanding that managers have toward those methods that best help them achieve their goals.



Graph 2: Type of planning.

Source: the authors

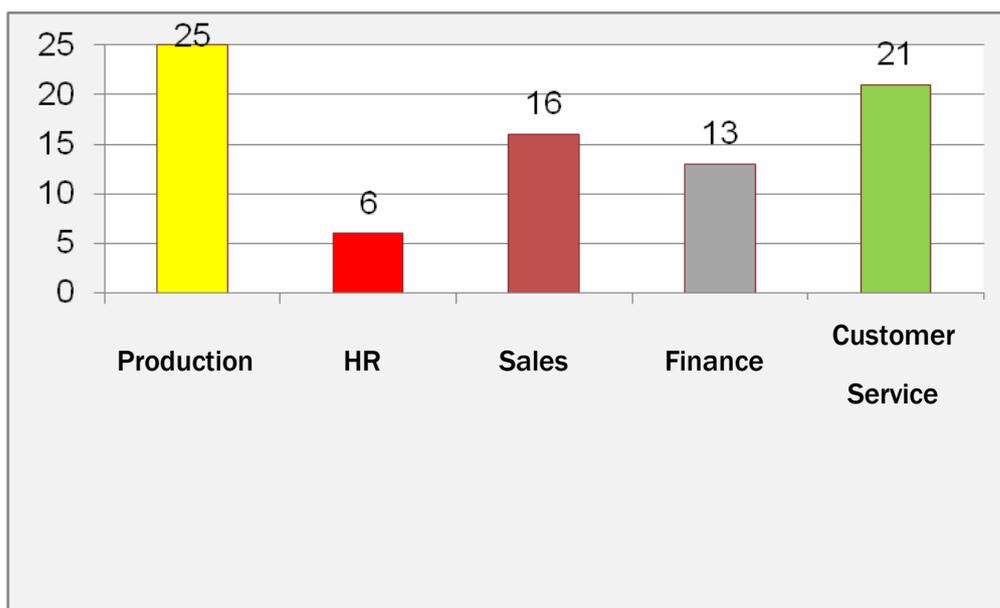
This graph shows some disparity among respondents, but it is clear that most of them, 13, understand that it is essential for bakers to produce by means of planning. It can be understood that these organizations trace their goals and promote means to achieve them. This observation is understood by the theoretical basis of Chiavenato (2010).

On the other hand, we notice that the other 12 respondents do not have a plan, confirming the idea of an unorganized and informal structure. The goals are not structured (defined and detailed), according to Stevenson (2001). Planning is important for the 9 respondents who do this weekly.

It is possible to imply that some tools that promote advantage in the process of production planning and its processes are left out by lack of knowledge. Such tools are market research, statistics and other relevant methods as seen by the authors Pozo (2008) and Laugeni & Martins (2006).

When questioned about which aspects of bread production are the most important, production and customer service come first. There is planning in almost all departments – production, sales, finance and customer service. Planning is not important in the HR department, leaving out a sector that is responsible for the selection process, hiring, firing, among other important issues to the organization.

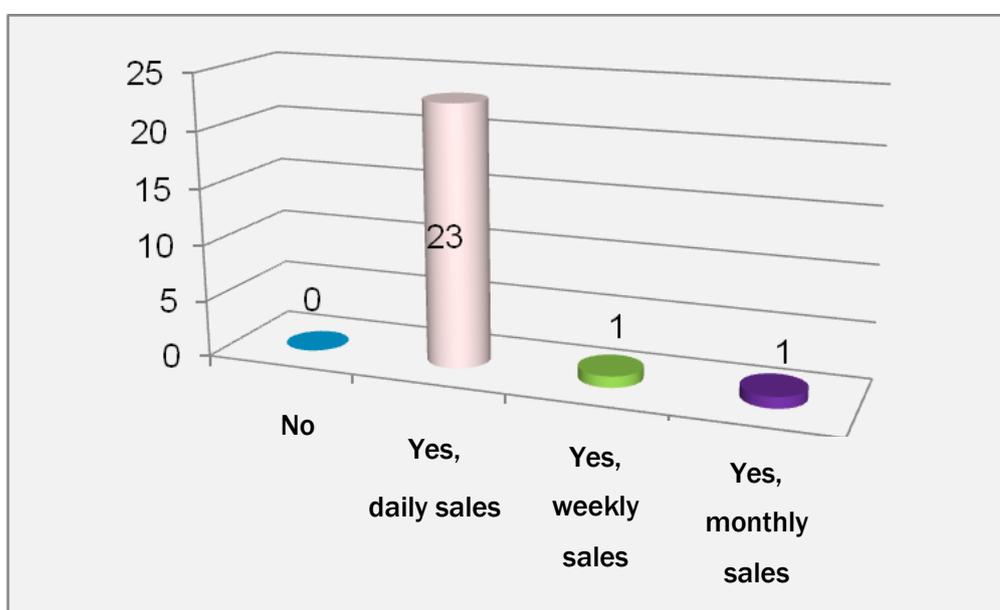
That is, there is a lack of preparation by organizations in hiring skilled labor and motivate them, since HR, which is one of the main departments according to Milkovich & Boudreau (2008), is left out. This department has the ability to select and recruit people, taking advantage of knowledge and different techniques according to Milkovich & Boudreau (2008).



Graph 3: Aspects that are part of planning.

Source: the authors

So far we have identified the relevance of planning for entrepreneurs, which planning models are used, if there is planning in them and in which departments. The graph below shows a type of planning that stands out.

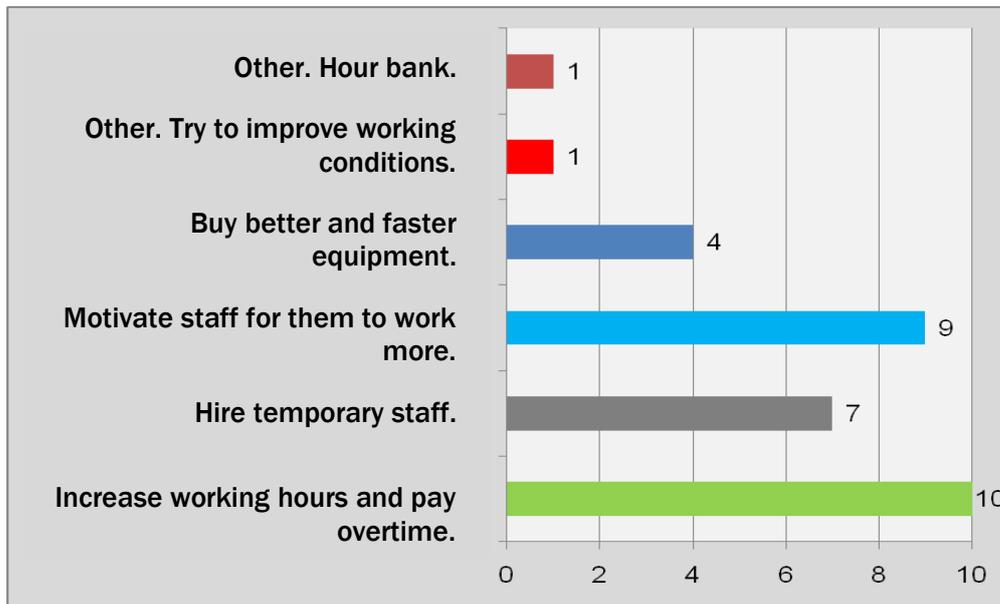


Graph 4: The planning is based on sales of a certain period.

Source: Field study

Only one bakery works with a weekly planning. One with monthly planning

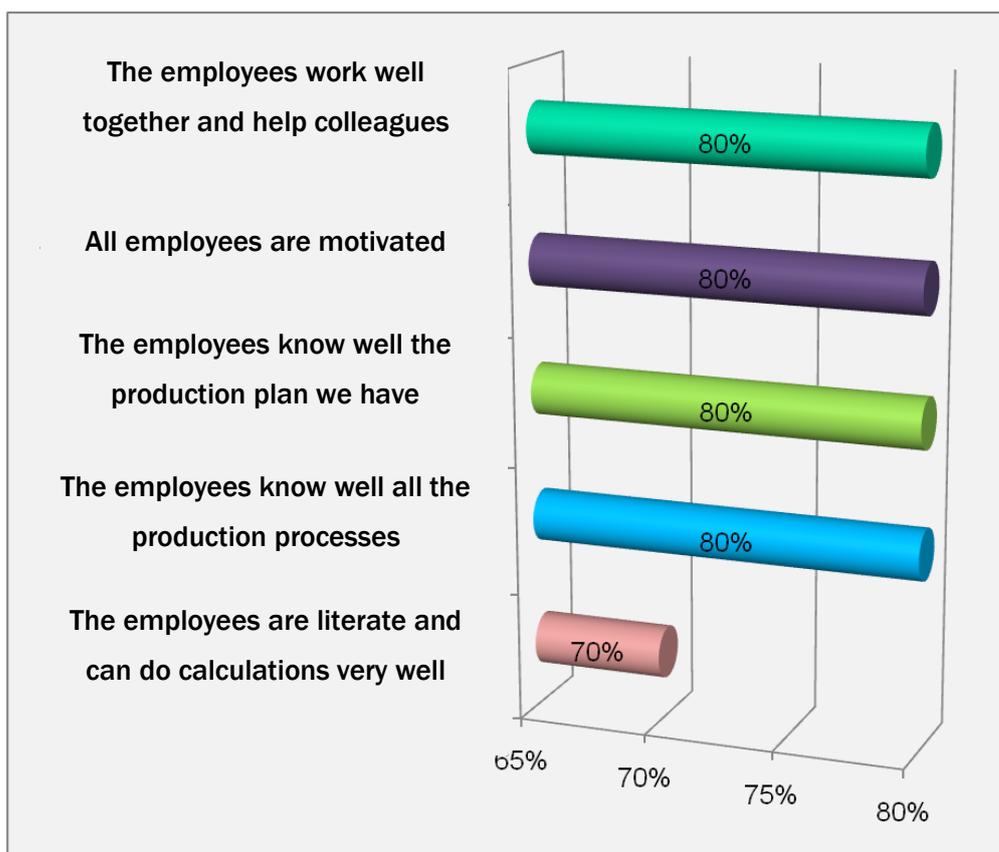
and the other 23 respondents answered that they should plan based on their daily sales data.



Graph 5: Methods used to meet peaks of demand.

Source: the authors

On employee knowledge of the existence of a production planning, the survey showed that on average 80% know and contribute for the achievement of their results.



Graph 6: The skills, knowledge and attitudes to achieve the results.

Source: the authors

The answers show that on average 80% of employees are able to interact with others and they do so. This understanding of the respondents shows that their companies are structured in an organized manner, i.e., an organization can be understood that way when everyone works together to achieve a common goal as the understanding of Schermerhorn (2007).

## 6. Final Thoughts

When identifying whether the managers of bakeries in Capao Redondo work in a systematic manner, with respect to processes of planning and control of production and what difficulties they have to increase production, the results show that managers work with planning and production control so that the market is served at the time that the product is demanded.

The manager does not show a better result in the production, partly because

equipment must be renewed every year in order to produce more and better; the formation of the baker needs to be constantly broadened and improved with courses and technical training; application of systematic and frequent control techniques in the use of inputs so that the bread, which is the main product of this enterprise, is always the best.

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