

# INFORMATION ORGANIZATION AND PRODUCTION PLANNING IMPROVEMENT IN A CLOTHES COMPANY IN PORTUGAL

A. Araújo<sup>1</sup>, L. Kapisch<sup>2</sup>, M. L. R. Varela<sup>3</sup>, J. Machado<sup>4</sup>,

<sup>1</sup>Department of Production and Systems, University of Minho, Azurém Campus, 4800-058 Guimarães, Portugal, [dricafaraujo@hotmail.com](mailto:dricafaraujo@hotmail.com)

<sup>2</sup>Department of Production and Systems, Azurém Campus, 4800-058 Guimarães, Portugal, [Id4571@alunos.uminho.pt](mailto:Id4571@alunos.uminho.pt)

<sup>3</sup>Department of Production and Systems, University of Minho, Azurém Campus, 4800-058 Guimarães, Portugal, [leonilde@dps.uminho.pt](mailto:leonilde@dps.uminho.pt)

<sup>4</sup>Mechanical Engineering Department, University of Minho, Campus of Azurém, 4800-058 Guimarães, Portugal, [jmachado@dem.uminho.pt](mailto:jmachado@dem.uminho.pt)

---

**Abstract** – In this paper we followed a qualitative research methodology through a case study, incorporating interviews with institutional actors involved (university, industry and government) in the cooperation project.

Although this study is limited to a case study, however, highlight the importance of Triple Helix networks in order to develop the research presents a proposal for improvement for the first methodology of medium-sized textile company to address the modelling conceptual planning, production and control.

In order to develop the research, development and innovation with the use of study methods which are: Planning and Production Control (PPC), master Production Planning (MPS), Materials Requirement Planning (MRP) Material, Capacity Planning using Global Factors (CPOF), and Capacity Requirement Planning (CRP).

Through the practical perspective of a case study of Triple Helix successful cooperation, we were able to develop the cases considered to be studied on the organization and the production of information for structuring an improvement of data necessary to implement the methods of planning and selected information within the company.

**Keywords:** Master Production Scheduling, Material Requirement Planning, Capacity Requirement Planning, Academia-Industry cooperation

---

## 1. Introduction

A paper should not exceed 10 pages. The change processes are fast variables that organizations and/ or small and medium enterprises (SMEs) should be organized for major changes in production processes and administrative sectors, to increase the national and international competitiveness. These changes are in all areas pushing for an improvement in information, product quality and services. Using adequate applications and low cost technology fits in the small flexible processes from small and medium size companies.

Nowadays to organize and to manage production systems becomes urgently to define the appropriate strategies for different environments and requirements of the market a [4] and Render. Thus, it is crucially important to identify the key functions of planning and control of production and its applicability in production systems [1], [6].

It can be said that in this decade, all economic blocks are the "beginning of a relationship" on a global

level, which is verified through:

- The increasing of low cost production, in manpower terms;

- The increasing of commercial trades exchange, and,

- The introduction of organizational planning for small and medium enterprises with global perspectives.

Therefore, it is necessary to identify the functions, methodologies and underlying methods to necessary technical information that sometimes becomes extensive and diverse [7]. These procedures will apply the acquired skills during the planning processes and production control implementation in industrial environments. Later, those skills can evaluate the selection and implementation approaches to support the proper functioning of production systems [2].

This work aims to develop a new agility to the production process of a medium-size company, enabling significant improvements in capacity functions to support Materials Planning decisions and planning techniques relating to MRP records. So it is possible that automation and processing some of the main

activities of the company are related to production planning indicators and performance indicators, as currently. It has properly collected and organized information regarding such activities, which are still made in a very traditional way. Therefore, in this paper a systematic and computerized support to bring improvements in the organization of information to be provided to the customer is provided. For the analysis of indicators can be related some techniques: Director of Production Planning and Material Requirements Planning.

The main ideas behind this work are organized over some closely related problems and similar real cases of the studied industrial case as follows: Section 2 brings some insights regarding the underlying review of literature. Section 3 describes the studied problem. Section 4 briefly describes the approach used in this work and the main results obtained. Finally the main conclusions of this work are summarized along with proposed future work.

## **2. Review of Literature**

According to [3], the best MRP controls the delivery amount and timing of raw materials, parts, sub-assemblies and assemblies for production operations, the right materials for production are delivered on the deadline. The receipt of materials can be slowed down or accelerated in response to changes in production schedules, reducing labour costs, materials and indirect expenses. Another important aspect involves checking techniques to provide data relevant to the production capacity can be adjusted in order to ensure implementation of the PDP.

To define PDP as the main entrance of information for the MRP system once that the main function of MRP is to turn the PDP needs for each of the components, on a time scale. Other types of input information are mere reference data required to achieve the main function [2].

The master production schedule is the basis of all critical capacity and resource planning in all types of manufacturing companies. The plan's necessity is to control the priorities of the batch jobs and to respond among other information.

However, all authors agreed that the above PDP or MPS depends on the different ways of production of several products to attend the final client that uses basically three types of approaches: Manufacturing for inventory, manufacturing on demand and mounting.

Relative methods with some typical characteristics and corresponding to control, for better strategies manufacturing industries between the resources conditions and demand for materials, and the advantages and disadvantages of MRP planning tool for further study in the event.

Furthermore, in [4] was presented the request of an integrated approach in business and describes the experience of Collins Industries that found significant benefits in terms of applying the technique of MRP.

According [7], Kawasaki produces six different

types of motorcycles and motorized water scooters in U.S. factory. About 100 different items of final products are manufactured to be transported to distribution centres of the company. Although the demand for products is highly seasonal, the workload at the factory is stabilized, allowing for a proper management of inventory of finished products notably performed at distribution centres. Moreover, the company has often new product designs in order to express its adaptation to the market needs and engaging changes in the products. Besides that the literature searches done over the Production Planning Director based on author [4], allowed to describe the experience of Collins Industries and planning capacity procedure used. According described by [7] Kawasaki consisted of two completely different companies but with the same goal in terms of targets for the productivity index, which can be used in the traditional procedures of planning control of production that includes the MRP e CRP techniques.

## **3. Description of the Problem**

The Company specializes in the manufacture of T-shirts for samples according to customer needs. During the demand ordered by the customer no information is able to be passed on with all efficacy and efficiency of the order done by the customer. And even for companies to outsource the information comes late in the production process. The deliver on the planned date facing a new challenge, for practical use is missing data samples, and better planning developing a process of manufacturing process.

The process is initiated by means of three cost centres, which the first set is produced and used in parts made to the two articles A and C; the second centre cost is the production of type size by a pre-existing formula consisting of different materials; the third center cost is calculated, after the article N shirt, then the purchase of raw material for the two articles.

After this operation, it must obtain levels of data to perform the calculations and material needs that have standardized planning and production control. The following operation consists in transforming the data from a planned production capacity depending on the specific work centres that were used to manufacture the article A that has a time of 1 hour and the product N 2 hours.

The next step in the planning process is analytically checked according to the compliance of hourly production capacity. The necessary articles production indicates consistent values of the planned production capacity. The amount which can be found in the stock inside the company must satisfy the customers' needs.

The final operation of the manufacturing planning process provides the details about the production planning for the articles A and N, which have to be produced at the correct time, and this production planning task is performed through the material requirements planning system, based on the MRP (Materials Requirement Planning) technique. To

achieve appropriate MRP records they have to incorporate the security inventory levels for the several items of the corresponding components planned to be produced by the Company. As an inventory form that will go directly into the warehouse or for items or components that are purchased through outsourcing as materials/ raw-materials.

Finally talking about the CRP planning technique procedure contains more information about MRP releases and the current state of the already implemented releases (scheduled deliveries) in individual work centres and the planning results of the production capacity required in this study about building articles considered (A, N).

#### 4. Production Planning Approach and Results

The entire production planning described above seems simple enough, but it hides a very complex scenario that led to the need for this study.

As noted above for the fulfilment of orders on each article, they have to pass through distribution canters and a preliminary survey of gross requirements for various items and the allocation of existing stocks in a box or on order, against these gross requirements, then obtaining the net [8].

Throughout this production, the planning control is the main concern that focuses on getting positive feedback from the management company, who was clearly pleased with the new developments and results achieved on this development. In order to improve the organization of information in the company and the implementation of procedures that would allow greater versatility and productivity.

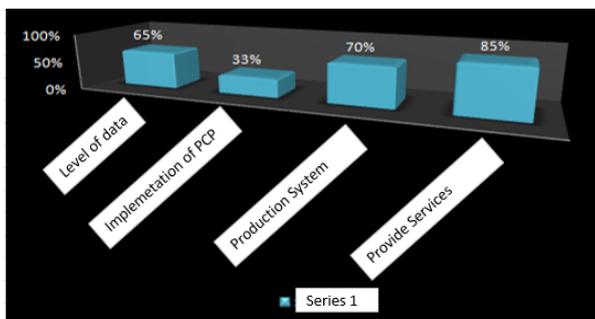


Figure 1: Productivity Indicators

So let us check at the details of this particular stage, for further analysis, the improvements in terms management and stock rotation.

As you can see, there was an improvement in the use of financial resources of the company Fig.02. After the implementation of the new way of organizing information and the addition of new production planning procedures, based on the table of material requirements (MPS and MRP) and capacity planning was carried out, by using appropriate methods (CPOF and CRP).

Reaching a percentage reduction of 47.6% prospectively which mean lower cost to maintain the

stock and thus increase the company's competitive advantage. To answer in terms of methods of delivery CPOF and CRP, the needs to meet production master plans and detailed plans of material requirements (MRP) established situation.

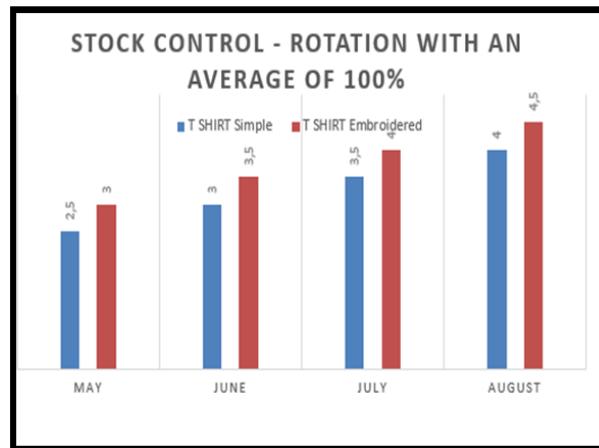


Figure 2: Rotation Stock

In this scenario, the flow of materials in the production process was reduced in Fig.03 as timing cycle giving the company greater speed and agility in meeting the needs of its customers.

Getting other benefits in relation to other companies to create a new scenario resulting indicators of the importance of good control in terms of planning and better coordination between sales and production. The new businesses indicators for the 4 levels are to improve the competitive position, improve to meet customer needs, better production schedule and effective cost reduction. For the company were identified three (3) levels of development: reduction of inventories was first noticed a difference in considerable improvement of the relationship with suppliers and operators (manpower).

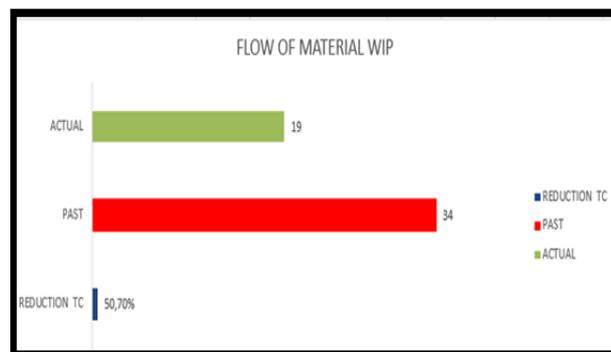


Figure 3: Cycle Time

These new levels of the Organization show that the company considered the implementation of the procedures for production planning as a significant factor in improving the levels of relevance and performance of the company.

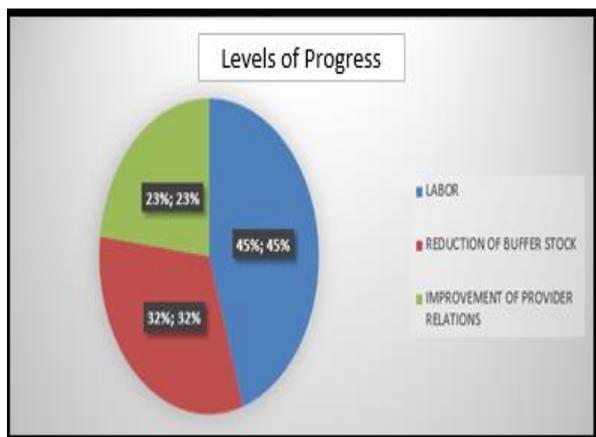


Figure 4: Levels of Progress

### 5. Conclusion and Future Work

The aim of this study was to find the best solution for the problem that addressing a subject in which there was a great deficiency by the company, which are typically reported in the literature as features in small and medium enterprises. The results show that the company will continue to use not only PDP, MRP, CRP and CPOF, but also calculations of other secondary metrics. Therefore, we can conclude that this work turned possible to assess a set of considerable benefits for improving the company's levels of organization, customer satisfaction and productivity performance.

Since it was clearly the company will on average get a substantial benefit of this type of planning, both qualitative and quantitative, confirming the basic assumptions mentioned in the literature that the selection and application of proper planning and production control.

This study concluded that the provision of this study in planning and implementation will prevent delays in the delivery of applications for client orders, which is one of the most important aspects in terms of goals.

We conclude that this case study sought to combine all the studied concepts, regardless of the size of a Company; no one will be able to grow and prosper without having done a good Planning and Production Control.

### Acknowledgements

This work has been supported by COMPETE: POCI-01-0145-FEDER-007043 and FCT – The Foundation for Science and Technology within the Project Scope: UID/CEC/00319/2013.

### 6. References

[1] Carmo-Silva, S. (2010). “Gestão da Produção”, Publicação Interna – Departamento de Produção e Sistemas, Universidade do Minho.

[2] Carvalho, D. (2007). Apontamento de Organização e Gestão da Produção, Departamento de Produção e Sistemas, Escola de Engenharia da Universidade do Minho. <http://www.dps.uminho.pt/pessoais/jdac/apontamentos.htm>

[3] CORRÊA, Henrique L.; GIANESI, Irineu G. N.; CAON, M. (2001). Planejamento, programação e controle da produção: MRP II/ ERP: conceitos, uso e implantação. São Paulo: Atlas, 2001. ISBN 978-85-224-2782-6.

[4] Heizer, J. and Render, B. (2004). Principles of Operations Management, 6th ed.

[5] Hopp, W. J., Spearman, M. L. (2000). "Factory Physics", McGraw-Hill, International Editions, Management and Organizational Series, ISBN 0-07-116378-6.

[6] Varela, L., (2011). “Organização e Gestão da Produção”, Publicação Interna – Departamento de Produção e Sistemas, Universidade do Minho.

[7] Vollmann, T. E., Berry, W. L., Whybark, D. C. (1997). “Manufacturing Manufacturing Planning and Control Systems”, McGraw-Hill.

[8] Slack, Nigel (1997). Vantagem Competitiva em Manufatura: Atingido Competitividade nas Operações Industriais. Trad. Sônia Maria Corrêa. São Paulo: Atlas.

**BRAND:**  
**«SMART MECHATRON - Competitiveness,**  
**performance and high quality through**  
**HIGH-TECH MECHATRONIC PRODUCTS »**

Copyright of Romanian Review Precision Mechanics, Optics & Mechatronics is the property of Romanian Review Precision Mechanics, Optics & Mechatronics and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.