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ANALYZING THE POSTPONEMENT OF TIME PRODUCTION SYSTEMS IN MAKE-TO-STOCK AND SEASONAL DEMAND

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Abstract

The supply chain management, postponement and demand management functions are of strategic importance to the economic success of organizations because they influence the production process, when viewed in isolation and empirically may hinder understanding of their behavior. The aim of this paper is to analyze the influence of the postponement in an enterprise production system with make-to-stock and with seasonal demand. The research method used was a case study, the instruments of data collection were semi-structured interviews, documentary analysis and site visits. This research is restricted to analysis of the influence that different levels of delay and the company's position in the supply chain have on the practice of demand management in the productive segment graphic, product spiral notebook and also in relation to geographical focus (region of the state São Paulo), in which it will seek to interview the managers and directors. As a way to support the research on the analysis of case study and the final considerations will be discussed the following issues: supply chain management, postponement, demand management and production system make-to-stock. The demand management can be understood as a practice that allows you to manage and

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coordinate the supply chain in reverse, i.e. the consumer to the supplier, in which consumers trigger actions for the supply of products can make the process more efficient. The purpose of managing the supply chain is able to allow the addition of value, exceeding the expectations of consumers, it is necessary to develop a relationship with suppliers and customers win-win. The postponement strategy must fit the characteristics of the turbulent environment within the markets along with demands that require variety of customized products and services and reasonable costs, aiming to support decision making. The postponement of time can be a way to soften the increase in inventory of finished product in the company, which may have a high value, being necessary to reduce the lead time and also suppliers to change their production strategy of make- to-stock to make-to-order. The production system make-to-stock shows enough interest to organizations that are operating in markets with high demand variability, i.e. variations in seasonal as a way of trying to protect their production and be more responsive to market needs.

Keywords: Postponement, Supply Chain Management, Demand Management, make-to-stock.

1. INTRODUCTION

Organizations today must be concerned not only with their production, with demand for its products by the consumer market and its supply chain, as this tripod cannot create differential in relation to its competitors. This difference that the consumer is always looking for and demanding, they are: price, quality and availability.

How to reduce production costs without affecting the quality and availability of product on the market? From the inventory postponement strategy. This strategy coupled with the management may allow a reduction in product cost, since this is talking about reducing the risk of loss of finished product because it has a high added value, increased flexibility in adapting to market needs.

ISSN: 2236-269X
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According Edalatkhah (2006), in the new economy, supply chains are needed to address various markets around the world, set up delivery of customized products, planning for change, never together with speed and precision considered possible before. Managers need to work with various partners to monitor the activities being performed together, in order to solve problems and delays that may occur.

According to The Global Supply Chain Forum, "the supply chain management is the integration of key processes, from consumers to producers of raw materials. SCM involves many areas such as demand forecasting, procurement, manufacturing, distribution, inventory and transport, interacting prospects strategic, tactical and operational (MCAD; MCCORMACK, 2001).

According to Tan (2002), GCS en ¬ volves the integration of business processes through the supply chain, including the coordination of ac ¬ ities and processes not only within an organization ¬ tion alone, but of all that make up the supply chain.

According to Nascimento Neto, Oliveira and Ghinato (2002), the CPFR is a tool to facilitate collaborative planning among the participating companies through the reduction in inventory levels, combined with improved service levels, in order to address issues such as: the influence of promotions on sales forecast and inventory management, influences of changes in the pattern of demand, supply inventory to ensure availability of products on the shelf, to enable greater coordination between enterprises in the chain, allow greater synchronization between the various processes in the industrial manufacturing processes and forecasting.

The CPFR can be defined as a set of rules and procedures by the Voluntary Interindustry Commerce amparo Standards (VICS) committee was founded in 1986 with the aim of increasing the efficiency of supply chains, specifically the retail sector, these standards that aim to facilitate physical and information flows (NASCIMENTO NETO; OLIVEIRA; GHINATO, 2002).

For Rodrigues and Oliveira (2009) the demand management is a practice that allows you to manage and coordinate the supply chain in reverse, ie the consumer to

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the supplier, in which consumers trigger actions for the delivery of products making the production system.

According Widiarta and Berghen (2004), there are several assumptions that must be considered in the modeling of demand management:

a) There is no possibility of coordinated replenishment. It is assumed that all suppliers are sorted independently;
b) It is assumed that demand is stochastic and independent manner with a known probability distribution;
c) The parameters are stationary. The parameters in our systems are updated occasionally and the general trend in demand for the product is more constant;
d) There are multiple items with limited storage capacity. Storage limitation is represented by the number of available palettes and shelves for those that can be used on a particular item;
e) The demand is seasonal in some cases. The demand for a product finished the month with a large percentage of zero values (often 30 percent or more), with values greater than zero, randomly mixed;
f) The replenishment time is always constant during a predetermined period. Therefore, if two or more replenishment orders are simultaneously outstanding, they should be processed in the same order in which they are placed. In another word, it may not cross;
g) There is no quantity discount with regards to the number of quantity ordered by the company; and
h) There is only one point providing. The products are provided at the same place and share a common facility inventory.

For Lambert, Cooper and Pagh (1998), demand management is one of the eight cases and requires interfaces with the other seven as shown in Figure 1. We describe the processes that make strategic and operational management of demand, including sub-processes and activities. More over, one can identify interfaces with

corporate functions, the other management processes, supply chain and other companies.

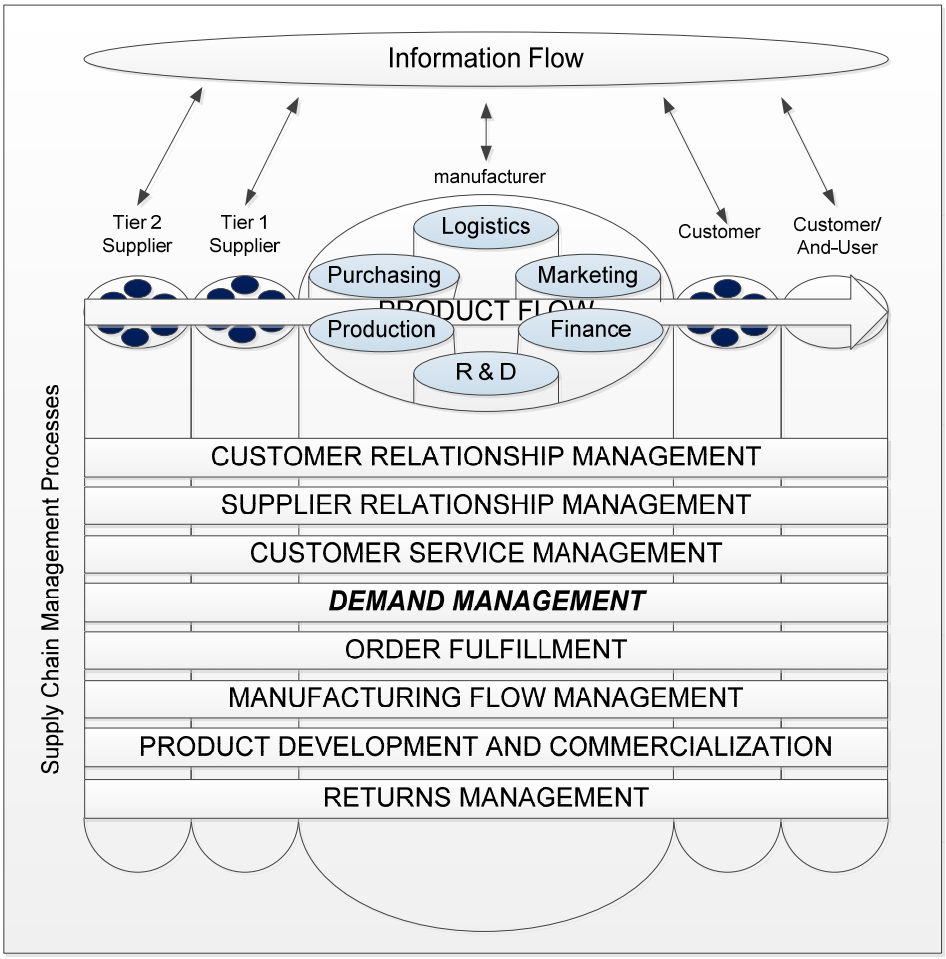

Figure 1: Supply Chain Management: Implementation Issues and Research Opportunities
Source: Adapted from Lambert, Cooper e Pagh (1998)

This activity manages the integration between the supplier, the business and consumer, is responsible for proper planning of all the demands generated, external or internal, with the aim of which has a balance between what the supplier can deliver, production can and what the market needs (FAVARETTO, 2001).

According to Croxton et al. (2001), the process of demand management has strategic and operational elements, as shown in Figure 2. In the strategic process, the team provides a structure for managing the process. The operating process is the updating of demand management. The implementation of the strategic process is a necessary first step for integrating the company with other members of the supply

ISSN: 2236-269X
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chain, is at the operational level that the day-to-day run. The Figure 2 also shows the interfaces between each sub-process and the other seven cases. These interfaces may take the form of a transfer of data to other processes require, or may involve the sharing of information and ideas with other team process.

According to Pacheco and Candide (2001), in MTS the product has started its production based on demand forecast. The arrival of the application causes your service almost immediately. It is suitable for products with predictable demand, and may have high inventory cost.

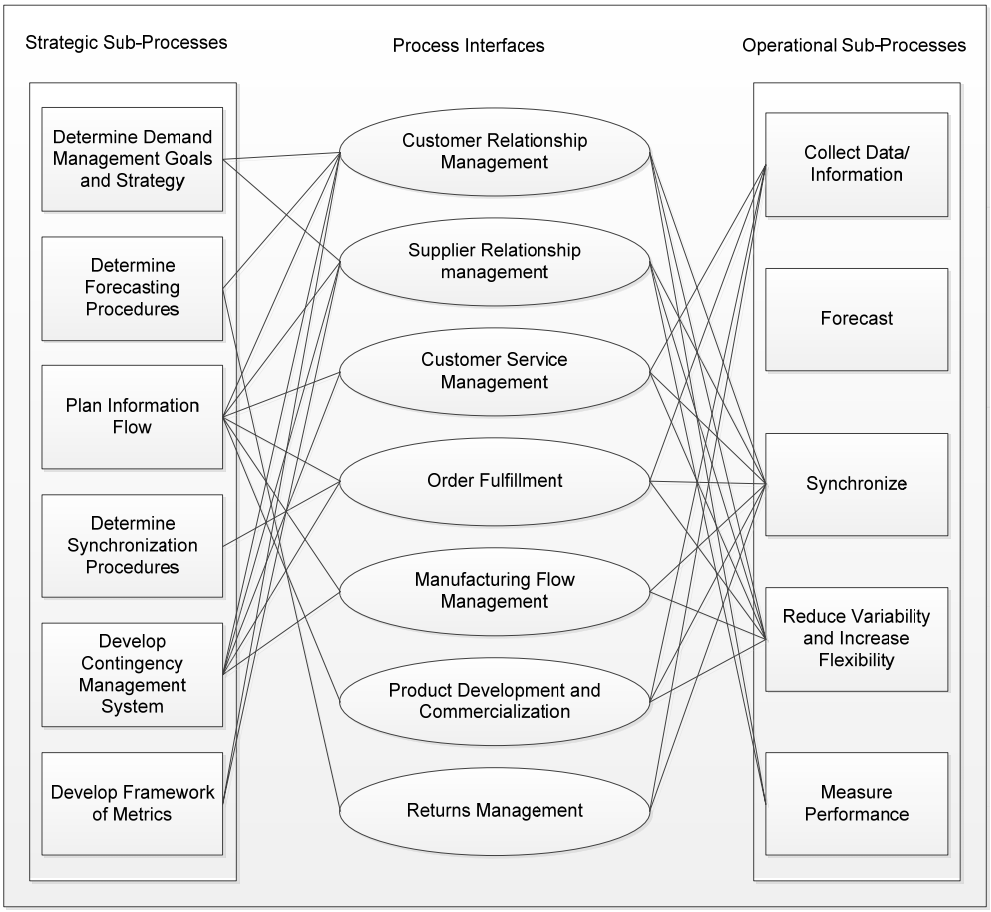

Figure 2: The Supply Chain Management processes
Source: Adapted from Croxton et al. (2001)

Daru and Lacerda (2005) describe that manufacture for stock is a common practice, where one can forecast demand, and can enjoy moments of the crop to be produced, using resources better and more balanced way of loading. But this policy

ISSN: 2236-269X
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has some disadvantages, which would be the high cost of storage and the difficulty of predicting what will sell.

According to Van Hoek and Dierdonck (2000), Verol (2006) and Zhang and Tan (2010), the concept of postponement is that risk and uncertainty are the costs of the differentiation (form, place or time) of products that occurs during manufacturing activities, storage and delivery, being based on the characteristics of the product / process in the supply chain: (a) product design: the specific content of the operation postponed (delayed), (b) process: the time when the activities are delayed in the process, and (c) place: the location where the delay happens.

Ng and Chung (2008) commented that the strategic placement of the decoupling point the supply chain, the strategy of postponement can be used. The purpose of the postponement is to increase the efficiency of the supply chain, moving product differentiation (at the point of dissociation) closer to the end user. Because the risk and uncertainty are the costs of goods differentiation and differentiation could occur in the product itself and / or the geographical dispersion of inventories.

Yang and Burns (2003) describe the illustration shows three different supply chain strategies which are closely related to the concept of postponement. The dotted line in Figure 3 reflects how the delay is associated with the customer's point of disengagement, in which the end customer influence the supply chain and distinguishes prediction oriented activities.

The postponement of way is to manufacture a product or standard basis in sufficient quantities to achieve economies of scale, while the characteristics of completion, such as color, packaging, etc.. are postponed until customer orders are received and are classified into four levels: tagging or labeling, packaging, assembly and manufacturing (FERREIRA; BATTLE, 2007).

Mendes et al. (2008) based on Zinn (1990) describe and 4 in the existing subdivisions in the postponement of discourse form which a brief definition.

ISSN: 2236-269X
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a) Postponement of Labeling: The products are stored without any kind of classification. Labels and tags will be displayed when a request is made, and the client specifies the brand that will identify the final product;
b) Postponement of manufacture: The last manufacturing steps are completed only after confirmation of the customer's request. Semi-finished products or even in the form of inputs are stored for the occurrence of differentiation of the commodity at a time or location nearest to the demand;
c) Postponement of product: The products can be designed according to a logic modules, or standardized components to facilitate the further differentiation; and
d) Postponement of the process: The production and distribution can be designed in ways that allow product differentiation downstream and upstream supply chain.

Yang, Burns and Backhouse (2003), Engelseth (2007) discuss the postponement of place involves the delay of freight down the chain until orders are received, thus keeping the goods centrally, and not have them in one place specific.

According to Wallin, Rungtusanatham and Rabinovich (2006), Bailey and Rabinovich (2006) and Drohomeretski, Cardoso and Costa (2008), the strategy of postponement of time assumes that the product will be requested from the supplier will only arise when a client request, which will enable the reduction of inventory levels and product obsolescence.

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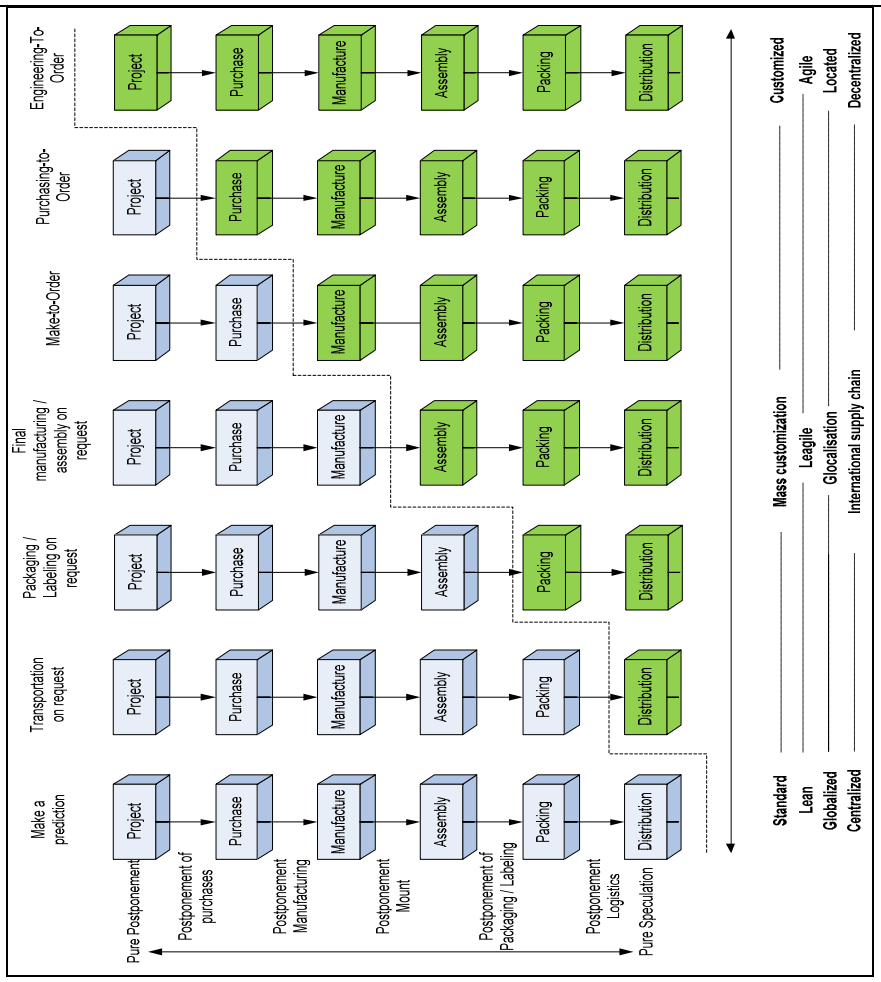

Figure 3: Postponement strategies and different chains of supplies
Source: Adapted from Yang e Burns, (2003)

2. CASE STUDY

The studied company employs about a thousand professionals in the city of Bauru, SP, distributed among the plant, which has a building area of 40,000 m², which are installed two production units, called Unit I and II, and distribution center that has approximately 11 thousand square meters, where it is transported throughout the production.

In unit I are basically produced calendars, office products and home and, secondarily, notebooks, this occurs by having a unit installed in equipment that automates the production of notebooks. In unit II are produced mainly notebooks. Since 2004, the company was acquired by a U.S. group, which is a producer of packaging, office supplies, stationery and specialty chemicals. The categories of

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stationery products with the U.S. group operates are: office products, envelope, promotion, school and home.

The company in Brazil adopts a production system with features of the classical model, which can easily be identified by features like: use of linear layout, production in large lots, low level of production flexibility as the market changes, a variety of finished products relatively high and specialized operators.

Has formally established an organizational structure in which the delegation is passed to the second echelon of the company, which have the function of industrial director, manager, industrial unit I and II, Quality Manager etc.

The semi-structured interviews with the director of industrial managers of industrial units and the manager of PCP, we could observe the reports of the production order, inventory and production lead time. The on-site visits were conducted with the oversight of some employees.

The company currently works with five product categories, and each has peculiarities relating to inventory management and are classified as follows:

a) *Appointment book*: they are products that have an expiration date, or are dated, and has seasonally, as is their peak from April to December, production will gradually grow;
b) *School*: by being sold for back to school, have a season and is their peak from July to December;
c) *Office*: for the audience of small businesses, professionals or offices. Do not have a seasonal pattern, being produced almost all year round;
d) *Home*: products that have a very distinct feature, for domestic use. Do not have a seasonal pattern, being produced almost all year. It is a very specific niche and exploited in the United States that is being developed in Brazil, where the company is developing products and doing some benchmark to detect your level of acceptance in the Brazilian market; and
e) *Cards and envelopes party*: this new product line was incorporated into the productive process, through the acquisition of another company

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located in São Paulo. This product line according to the board came to complete the mix of products and alignment with the strategies adopted by the U.S. group. This product has a seasonal pattern with gaps between periods commemorative relatively small.

As a way of illustrating the manufacture of college notebooks, will be shown a sequence of pictures, starting with the processing of paper rolls that arrive at the factory, which weigh about a ton.

These coils are placed on machines pautadeiras, that process has started manufacturing the notebooks. The process is fully automated. The first step is to pautação leaves, those blue lines that usually guide a linear writing, after being ruled, the paper is cut into sheets, which will form the core of the book, the leaves are merged and run on a treadmill, where they will receive the dividers and tabs of material inside the notebook. Further, the brains are cut and drilled and are waiting to receive the cover, the palette of adhesives, plastic cover and back cover. At this moment there is the process espiralização notebook, which goes to the box and then boxed is to follow your destiny.

The company has capacity to produce, per month, about 400 000 notebooks. To meet the season back at school the school year in Brazil, which goes from January to March, the production begins in September. At the end of the period back to school, all the production is focused on meeting the demand of the Northern Hemisphere.

Product models that compose the product lines for the year 2011 will be approximately 1,500, divided according to Table 1, which also has its representation on the numbers of items. In Figure 4 is presented in graphic form, the distribution of product models and their representation. The models that comprise the product lines are not managed in one way, first because the company has developed a planning approach for product line and, second, respecting seasonality and the criticality of each product category.

Table 1: Value of representativeness of the model and export products

Product line	Number of models	Representativeness%	Export Representativeness%

ISSN: 2236-269X
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School	700	46,67	300	50,00
Office	275	18,33	125	20,83
Appointment book	200	13,33	75	12,50
home	150	10,00	100	16,67
Cards/Envelopes	175	11,67	0	0,00
Total	1500	100,00	600	100,00

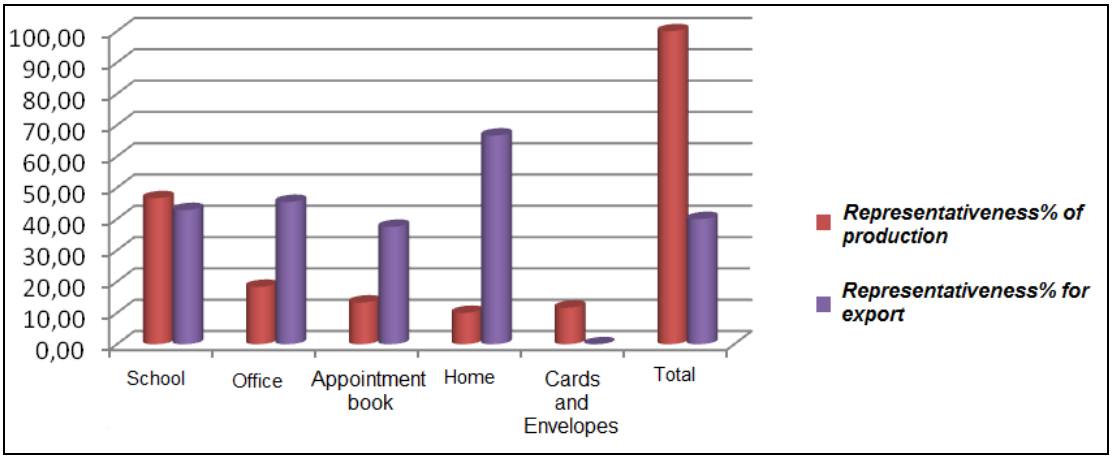

Figure 4: Representativeness% in the number of models and what is exported

In school category, the 700 models that are produced, exported about 300, to meet both external customers, as the holding companies, or so-called intercompany sales.

The delimitation of the study will be in the company product line school. Being a line in which no seasonality and production system adopted is the Make-To-Stock, will be reviewing the process of manufacture of the product model spiral notebook.

The production strategy employed is to make to stock (make-to-Stock), since the product undergoes spiral notebook with the seasonality of the period back to school the beginning of the school year and production capacity can not immediately meet all requests that will be generated in this period.

Based on the seasonality in production capacity and information systems, management, together with the support of managers in the areas of marketing, sales, production, finance and supplies formulate the demand forecasts.

Adopted are two ways to plan the production: the first is through the planning process in materials, inventory, production routings, production times. The second is

through the dedication of the lines relative to certain product category. The production area has a team of Times and Production Methods (TMP) that participates in the development of products. The goal of this team is technically evaluating the product and, along with the marketing staff, develop it, preparing a feasibility study, ie whether it is possible to produce this product within the script, what will its cost, which will be losses and what materials will be used.

The TMP team has developed new procedures in order to reduce losses, thereby avoiding a product coming from the marketing area with a very high level of loss, which can be time, setup, script and raw materials.

All possible compositions of product are documented in order to be able to assess the costs to develop a measurement standard. This documentation consists of the product design, bill of materials, efficiency of the machine, setup time and time to production of a certain minimum lot size of product.

We use the classification method "ABC" with the objective of defining production cycles, linked to the volume of stock, basing on the size classification of stock raw materials, intermediate stock, impact on cost and how to produce and improve processes.

This classification method was suitable for the product categories that have no seasonality, when all items classified as "A" possess spare monthly cycles and can impact the production, the items classified as "B" have spare cycles bimonthly and can impact moderately in production, and the items classified as "C" are quarterly replacement cycles and low impact on production.

In relation to products that are affected by seasonality and are closely linked to the period around the start of classes the school year, the ABC classification method had to be redrafted to work with a classification by production volume, i.e. products classified as "A" have a volume of 100,000 Un., which will be produced in batches of minimum 25,000 Un.; products classified as "B" have a volume of 50,000 Un., which can be produced in batches of minimum 25,000 Un.; products classified as "C" have an average volume of 5,000 Un., which are produced in a single batch.

The product spiral notebook, having a turnover of high raw material, usually have relatively few weeks of raw material in stock and process using the FIFO concept for the raw paper, corrugated cardboard, paint and varnish and for LIFO other materials (wire, plastic accessories), both in inventory management and in accounting. Being a very large volume of material and for not having an area proportional to warehousing and stock coverage varies between three and six weeks.

In relation to the finished product, working with manufacturing to stock, which are stored at the distribution center and should be adopted FIFO concept, finished products are packed in boxes, pallets and then being put on the shelves, which should be labeled as identification.

The PCP team's main function is to analyze the quantity of raw materials held in stock, which the productive capacity, which should be produced and at what time, firing the purchases of raw materials. There is a team dedicated to sales forecasting, observing the market and makes sales forecast for the next month, and from this information determines how much should be produced.

From the general plan of sale, the PCP makes the production plan, capacity analysis, analysis of critical resources, materials analysis and critical analysis of best screenplay, setting a schedule with shorter maturities, or a monthly schedule, as way of measuring the volume produced which will signal in the volume of raw materials purchased, the machine downtime due to lack of product, setup, maintenance. This check is done weekly.

The monthly schedule is divided in four weeks, to be passed to the factory planning week, when he was studying the material to be used, defined roadmaps for manufacturing and the possible backlash.

In the monthly schedule is also planned to set up times for equipment and assemblies, as way to have a better use of downtime.

It can be observed that the postponement of inventory and production occurs across the board, or the postponement of how the product will only begin to be produced is achieved when the average stock of covers, back covers and

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accessories since the start production this equipment will only operate 12 hours daily for a period of 30 days.

Although the postponement of such a product was observed that the models are designed with an advance of up to 6 months, so you can plan to purchase, payment and delivery of raw materials.

In the process of postponement so there is concern in programming in a very thorough delivery of raw materials throughout the production period, since the time of delivery may vary according to the productive period, according to Table 2 and Figure 5.

Table 2: Change in days for delivery of raw materials

Production period	Day interval between deliveries
Month 1	11
Month 2	8
Month 3	5
Month 4	3
Month 5	5
Month 6	8
Month 7	11
Month 8	18

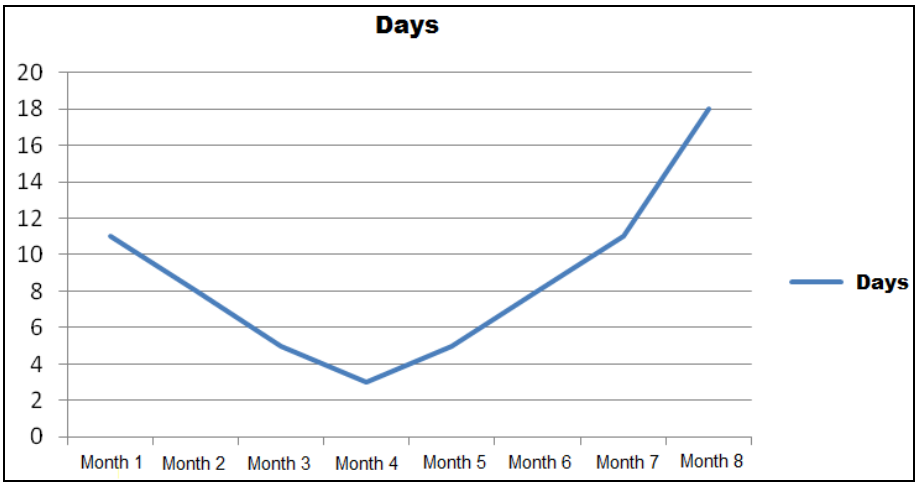

Figure 5: Graph of variation in days for delivery of raw materials

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Noting the delay in a process focused on the customer became clear that there is no type of procedure, because the product spiral notebook has a relatively high demand of about 35 million and that the client and the consumer is not willing to await the arrival of product, wanting to buy and consume immediately purchase.

3. FINAL REMARKS

The method of deciding the level of postponement of the stocks of raw materials and finished products can be improved, since the decisions are linked to the feeling of executives on the attitude of the consumer market.

It was noted that CPFR can be the tool being used wrongly, since it might notice that there is a scientifically reliable method to validate the information given by the customer and supplier of level 1.

The formulation of the production needs may be influenced by the interests of suppliers and departments with predicted postponement bad estimate, since the control over information that is not so fastidious.

The team of PCP could be more comprehensive and collaborative with the departments and thus influencing the definition of the ABC classification of products, creating benchmarks and measuring productivity and inventory postponement.

As a way to improve demand forecasting and supply chain management, could be adopted Vendor Management Inventory (VMI), allowing you to create the practice of shipping raw materials and finished products on the date and amount required at the client level and joint management of reserves.

With the use of tools CPFR, VMI and QR as a complement to the postponement of form and time, will better manage the risks of uncertainty, and allows the application of statistical tools.

As a complement to CPFR and VMI, could be adopted, the quick response (QR), which allow the practice of encouraging customers / consumers to exercise a level of effective management of supply chain and, consequently, improve order management, spare inventory, handling and transportation and exchange of information, thus reducing costs and improving levels of delay.

The application of quantitative tools to forecast the demand will enable more precise information about the consumer market, as the postponement should behave during production. These tools are still used so much in its infancy, requiring a detailed way better improvement of the employees involved.

REFERENCES

BAILEY, J. P.; RABINOVICH, E. (2006) The Adoption of Inventory Postponement and Speculation: An Empirical Assessment of Oligopolistic Internet Retailers. Transportation Research Part E: **Logistics and Transportation Review**. v. 42, n. 4, p. 258-271.

CROXTON, K. L.; GARCÍA-DASTUGUE, S. J.; LAMBERT, D. M.; ROGERS, D. S. (2001) The Supply Chain Management Processes. **International Journal of Logistics Management**, v. 12 n. 2, p.13-36.

DARÚ, G. H.; LACERDA, V. C. (2005) Utilização de Programação Dinâmica Multirotulada para Balanceamento do Uso de Ferramenta. In: CONGRESSO NACIONAL DE MATEMATICA APLICADA E COMPUTACIONAL, 28., 2005, São Paulo. **Anais...** São Paulo: SENAC.

DROHOMERESTKI, E.; CARDOSO, P. A.; COSTA, S. E. G. (2008) Uma análise comparativa entre a estratégia de postergação de tempo e a estratégia de especulação na cadeia de suprimentos: o impacto no estoque. In: ENCONTRO NACIONAL DE ENGENHARIA DE PRODUÇÃO, 28., Rio de Janeiro. **Anais...** Rio de Janeiro: ABEPRO.

EDALATKHAH, S. T. (2006) **Theoretical and experimental investigation of impacto of automatic identification in healthcare & automotive industries in Iran**. Dissertação (Mestrado em Business Administration and Social Sciences). Luleå, Sweden: LTU/TMU.

ENGELSETH, P. (2007) **The role of the package as an information resource in the supply chain: a case study of distributing fresh foods to retailers in Norway**. Dissertations (Department of Strategy and Logistics), Norwegian: Norwegian School of Management.

FAVARETTO, F. (2001) **Uma contribuição ao processo de gestão da produção pelo uso da coleta automática de dados de chão de fábrica**. Tese (Doutorado em Engenharia Mecânica), São Carlos: EESC/USP.

FERREIRA, K. A.; BATALHA, M. O. (2001) Condições para aplicação e uso do postponement na indústria de alimentos: o caso da empresa processadora de suco de laranja. In: ENCONTRO NACIONAL DE ENGENHARIA DE PRODUÇÃO, 27., Foz do Iguaçu. **Anais...** Foz do Iguaçu: ABEPRO.

LAMBERT, D. M.; COOPER, M. C.; PAGH, J. D. (1998) Supply chain management: implementation issues and research opportunities. **International Journal of Logistics Management**, v. 9, n. 2, p. 1-19.

MCADAM, R.; MCCORMACK, D. (2001)Integrating business processes for global alignment and supply chain management. **Business Process Management Journal**, v. 7, n. 2, p.113-130.

MENDES, F. D.; LIMA, F. D. M.; FUSCO, J. P. A.; SACOMANO, J. B. (2008) Postergação como estratégia competitiva no segmento jeanswear da manufatura do vestuário de moda – MVM. In: ENCONTRO NACIONAL DE ENGENHARIA DE PRODUÇÃO, 28., Rio de Janeiro. **Anais...** Rio de Janeiro: ABEPRO.

NASCIMENTO NETO, R. V.; OLIVEIRA, J. R. A.; GHINATO, P. (2002) Supply chain management: aplicação e ferramentas. In: ENCONTRO NACIONAL DE ENGENHARIA DE PRODUÇÃO, 22., Curitiba. **Anais...** Curitiba: ABEPRO.

NG, T. W.; CHUNG, W. (2008) The roles of distributor in the supply chain:push-pull boundary. **International Journal of business and management**. v. 3, n. 7, p 28-39.

PACHECO, R. F.; CÂNDIDO, M. A. B. (2001) **Metodologia de avaliação da viabilidade de mudança de estratégia de gestão da demanda de MTO para ATO**. Não publicado. PUCPR.

RODRIGUES, P. C. C.; OLIVEIRA, O. J. (2009) The importance of analysis of production system Engineering-To-Order and Make-To-Stock in two business sector graph In: INTERNATIONAL CONFERENCE IN INDUSTRIAL ENGINEERING AND OPERATIONS MANAGEMENT, 15., 2009, Salvador**. Anais...** Salvador: ABEPRO.

TAN, K. C. (2002) Supply chain management: practices, concerns, and performance issues. **Journal of Supply Chain Management**, v. 38, n.1, p.42-53.

VAN HOEK, R. I.; DIERDONCK, R. V. (2000) Postponed manufacturing supplementary to transportation services? Transportation Research Part E. **Logistics and Transportation Review**, v. 36, n. 3, p. 205-217.

VEROL, M. V. A. (2006) **Estratégias logísticas nas empresas de telefonia celular: status e oportunidades na gestão de aparelhos**. Dissertação (Mestrado Profissionalizante em Administração). Rio de Janeiro: IBMEC.

WALLIN, C.; RUNGTUSANATHAM, J.; RABINOVICH, E. (2006) What is the “right” inventory management approach for a purchased item?. **International Journal of Operations & Production Management**. v. 6, n. 26, p. 50-68.

WIDIARTA, H.; BERGHEN, B. V. (2004) Inventory systems for a make-to-stock and make-to-order environment. **Journal of The Institution of Engineers**, v. 44, n. 4, p. 31-40.

YANG, B.; BURNS, N. D. (2003) Implications of postponement for the supply chain. **International Journal of Production Research**, v. 41, n. 9, p. 2075-2090.

YANG, B.; BURNS, N. D.; BACKHOUSE, C. J. (2003)The management of uncertainty through postponemen., **International Journal of Production Research**,v. 42, n. 6, p. 1049-1064.

ZANG, C.; TAN, G. (2010) Classification of Postponement Strategies and Performance Metrics Framework. In: PACIFIC ÁSIA CONFERENCE ON INFORMATION SYSTEMS, 5., 2001. **Proceedings...,** Soul Korea, 20- 22 june, 2001. Disponível em: <http://www.pacis-net.org/file/2001/038.PDF>. Acesso em: mar, 2010.

ZINN, W. (1990) O retardamento da montagem final de produtos como estratégia de marketing e distribuição. **Revista de Administração de Empresas**, v. 4, p. 53-59.