



## The role of management accounting in just-in-time production

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### ABSTRACT

To cope with the increasing development and intense competition in the product market, the manufacturers need to transform their production line in accordance with market demands in order to maintain their position in the market. Considering the unpredictable market volatility, storage of the products and goods in warehouse proves to be risky because in the meantime the stored products may lose their popularity in the market. Hence, it is better for the manufacturing organizations to take precautionary measures in order to deliver their products to the consumers without keeping them in warehouses. Organizations should also be agile flexible toward market changes and develop their production process accordingly, in order to avoid storage of manufactured commodities as well as to keep up with the market demands. This case study focuses on the end product and storage of consumer goods in the warehouse. The present article presents solutions by which the manufacturing companies can deliver their products to consumers without having to store them in the warehouses; this article also presents solutions for organizations to stay agile flexible toward market changes in order to maintain their position and survive the competition.

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### 1. Introduction

Sponsored by the US Navy of and Iacocca institute, in 1991 Lehigh University studied 13 major manufacturers like General Motors, General Electric, IBM, Texas Instruments, etc. The purpose of this study was to determine features successful organizations in 2006. Later, over a hundred other organizations were studied. These studies were collectively named as the study of manufacturing institutes in the 21<sup>st</sup> century and their results were published in 1995 in a book entitled: Agile competitors and Virtual Organizations. Some of these results are:

- 1-New competitive environments have created numerous developments in the manufacturing systems and organizations.
- 2-Organizations with competitive advantages in this new environment which are able to manufacture products according to the customers' needs are agile.
- 3-The following are the features required for agility and speed:
  - Flexible manufacturing system
  - Having knowledgeable workforce

- A management structure which promotes team innovation both inside and outside the organization
- 4-If American organizations do not move toward agile manufacturing, the living standards in this country would be at risk.

According to the studies conducted in Lehigh University, new competitive environments have created numerous developments in the manufacturing systems and organizations. Organizations with competitive advantages in this new environment are able to manufacture products based customers' needs and stay agile. Agile manufacturing is a production strategy based on introduction of new products to the markets which develop quickly; it also to enabling the organization to respond to constant and unpredictable changes in the competitive environment.

### 2. Management accounting and its objectives

Management accounting refers to the process of diagnosis, measurement, collection, analysis, presentation, and monitoring of organizational activities in order to ensure optimal resource use and allocation. The following are some of the objectives of management accounting (Shabahang, 2005):

- Providing the necessary information for planning and decision-making

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- Helping managers with leadership and control of operational activities
- Motivating managers and employees to perform in alignment with organizational objectives
- Assessment and evaluation organizational units, managers, and other employees

It should be noted that market competition refers to a condition in which relatively numerous organizations and producers are active. Successful organizations in these markets are those who are more attentive to consumers' needs (Salvatore, 1998).

### **3. Warehouse**

In most organizations, warehouse is the place in which all kinds of products and materials are manufactured, distributed, repaired and maintained, packaged, received, stored, and exported. For this reason, warehouses are basically associated with product maintenance. Yet, warehouse management includes a lot more activities (Carter, 1998).

- Maintenance, control, and sending items
- Controlling all warehouses, yards, and extra-organizational warehousing units
- Material transfer
- Quality control
- Employee training
- Warehouse office works

### **4. Key elements of Just-In-Time (JIT) Production**

#### **4.1. Constant and monotonous manufacturing plan in a certain time horizon**

In just-in-time production system, different transportation, product supply, manufacturing, and delivery to warehouses constitute a constant and unified flow. Since in JIT systems there is not much window for delay, all the activities should be synchronized and coordinated. As a result, the production plan remains constant in a certain time horizon and the organization tries to adjust the operations to very accurate timetable so that at the end of the time horizon little unfinished products are remained.

#### **4.2. Minimization of the inventory**

Minimizing the inventory of finished and semi-finished materials is an important issue in just in time production. It reduces the cost of goods maintenance and makes the storage of goods in warehouse and workstations cost-efficient. On the other hand, minimizing the inventory makes the managers more sensitive toward the problems, hence making more accurate planning and decision-making and try to solve problems or prevent them from happening again.

#### **4.3. Implementation of machinery based on market demands**

In JIT production, the machinery is implemented based on production requirements. The use of group technology (GT) machinery implementation is a common practice in JIT production. In this method, by classification of the goods and products which are in the same family in terms of production process and by implementation of the machinery related to each family of products in the production line and bringing workstations closer to each other (since production classes demand smaller space and there are less semi-finished goods) the space required for manufacturing is reduced. In conclusion, implementation of machinery based on product requirement and the use of group technology have the following benefits:

- Possibility to change manufacturing process in accordance with market demands (flexibility)
- Less transportation costs
- Reduction of allocated space
- Manufacturing of diverse products in large volume

#### **4.4. Material and parts planning**

The main feature of JIT manufacturing is production based on received orders so that the finished goods are instantly delivered to customer. In this sense, the manufacturing plan is based on this issue and the production is planned in such a way that there is no need for storage and warehouse. When the production is based on received orders, providing primary parts and materials can be planned in a way that does not require warehousing. Of course it must be noted that it is not possible to completely avoid the storage of primary materials or finished and semi-finished goods; it is not possible to provide required materials instantaneously. However, application of this approach has to some extent managed to eliminate the issue of storage of finished goods.

#### **4.5. The new method of product development**

In modern methods, the interval between customer identification and transformation of customer need into a product has been reduced as much as possible. That is because if this time interval is long, customer demands might either be met by other competitors or change in a way that the manufactured product does not satisfy the newly developed customer needs.

### **5. What conditions should be created in order to avoid finished goods warehousing?**

#### **5.1. A customer oriented approach to planning and quality function deployment (QFD)**

It refers to a regular batch process for planning and design of new products or improves existing products by raking the following issues into consideration:

- Customers' needs

- Information about competitive environment and market demands
- Application of teamwork
- Use of flexible planning and design
- Transformation of qualitative demands into measurable goals

In the process of QFD, first the customer needs are transformed into engineering or design characteristics. Then the features of parts of products are determined regarding engineering characteristics. Considering these features and characteristics, the manufacturing operation is then programmed step-by-step. Finally, the operations of production control are designed and programmed. A closer look at this process reveals that it plans for production based on customer needs which can be constantly updated by dynamic implementation of QFD.

In fact, QFD process is a part of total quality management (TQM) which helps with quality engineering in the organization. It can be said that QFD seeks to find out whether the end product can satisfy customer needs. The House of Quality matrix (HOQ) is one of the main methods in QFD process first introduced by Hauser and Clausing (1988). This matrix is an instrument which collects data and information about a certain product and increases its chances of success. It also determines the changes need to be made in order to achieve that purpose. The components of this matrix are (quoted by Kung & Wen, 2007):

- Voice of Customer (VOC): in the first stage of HOQ, the issues the customers consider about a product are listed; the coefficients of relative importance are placed before each factor.
- Competitive Assessment: in each row of customers' needs, competitive assessments of the product are compared.
- Product Features: the features and characteristics of the product are listed in this section. Product features are a lot similar to customer needs (VOC).
- Correlation Matrix: in the correlation matrix, the relationships between all the characteristics of a certain product are assessed; it determines whether two characteristics have a positive, negative, or neutral relationship with each other.
- Relationship Matrix: this matrix evaluates the relationship between each product characteristic and its corresponding customer need; it determines whether a characteristic and a customer need have a positive, negative, or neutral relationship with each other.

## 5.2. Marketing methods to avoid warehousing

The following are some issues regarding marketing methods which aim at direct delivery of goods to the customers:

- Use of aggressive marketing: the task of sales and marketing units is to create market change so that the market is constantly supplied with new products.

- Presenting suitable alternatives to existing products: the manufactured goods and products should always be better than current market products.
- Introduction of new products to the market: new product model should be constantly introduced to the market.
- Back-up and customer services should be presented all through a product's life cycle.
- Products should be priced based on the perceived value by the customer, and not based on total costs.
- Conditions should be created for effective competition in small markets and for cooperation with other competitors.

## 5.3. Innovative approach

Intense competition, extreme environmental fluctuations, technological advancement, and environmental volatility force the organizations to accept innovation as a fundamental strategic instrument. Innovation is defined as employing and implementation of a new instrument, system, policies, program, process, product, or service which can either be developed inside and organization or purchased from outside sources. This in fact is a broad definition which covers all types of innovation. Innovative approaches which focus on increasing organization's flexibility and its readiness for change and development of new products and services and decreasing organizational inertia can positively contribute to long-term success (Hult et al., 2005).

Inclination toward innovation is a strategic behavior which demonstrates an open and active space for new ideas (Olson et al., 2005). Innovation is a key factor in firm's success. It refers to an organization's ability to use initiative and introduce new processes, products, and ideas to the market. Innovative activities are generally important for companies' success (Hult et al., 2005). The innovative attitude is a testament to the positive relationship between competitive advantage, new product's success and financial performance (Hult et al., 2005; Narver et al., 2004). The findings of related studies suggest that organizations which use innovation can achieve better positions in comparison to the ones which ignore innovation (Han et al., 1988). Innovation is a key factor in firm's success. It refers to an organization's ability to use initiative and introduce new processes, products, and ideas to the market (Hult et al., 2005). The attitude toward innovation reflects upon the knowledge structure which creates dynamism in the market, and then provides a knowledge-based pattern for development of required processes for establishment of a dynamic organization. In conclusion, the highly innovative organizations distinguish themselves from other organizations by the extent of innovation they demonstrate (Siguaw et al., 2006).

## 5.4. Quality management

The term “quality” refers to a set of product features and characteristics which can satisfy customer needs. When the customers perceive the idea that they have obtained value by purchasing a certain product they become eager to buy. The product is said to have a quality as high as it can satisfy customers’ needs.

## 6. Conclusion

When a product is designed, its features and characteristics are determined with regard to its type, production line capabilities, dimensions, resistance to heat, and etc. The manufacturing of the product takes place based on the above-mentioned criteria. The manufacturers should present goods which satisfy customer’s demands. This will prevent storage of finished goods and products in warehouses. Manufacturing companies should also be flexible to market change and competitive environment so that they can update themselves in the time of change in order to remain in the competition and well as avoid product storage and warehousing.

## References

- Carter RJ (1998). Warehouse management and related operations. Translated by Khosropanah R, Industrial Management Organization Publication, Tehran.
- Hauser JR and Clausing D (1988). The house of quality. *Harvard Business Review*, May-June, 63-73.
- Han JK, Kim N and Srivastava RK (1998). Market orientation and organizational performance: Is innovation a missing link. *Journal of Marketing*, 62(4): 30–45.
- Hult GTM, Ketchen DJ and Slater SF (2005). Market orientation and performance: An integration of disparate approaches. *Strategic Management Journal*, 26(12): 1173–1181.
- Kung CY & Wen KL (2007). Applying grey relational analysis and grey decision-making to evaluate the relationship between company attributes and its financial performance—a case study of venture capital enterprises in Taiwan. *Decision Support Systems*, 43(3): 842-852.
- Narver JC, Slater SF & MacLachlan DL (2004). Responsive and Proactive Market Orientation and New-Product Success. *Journal of product innovation management*, 21(5): 334-347.
- Olson EM, Slater SF & Hult GTM (2005). The performance implications of fit among business strategy, marketing organization structure, and strategic behavior. *Journal of marketing*, 69(3): 49-65.
- Salvatore D (1998). *Theory and issues of Micro-economy*, Translated by Sobhani H, Ney publication, 15<sup>th</sup> edition, Tehran.
- Shabahang R (2005). *Management accounting*. Iran’s Audit Organization’s Center of Accounting and Auditing Studies, Tehran.
- Siguaw JA, Simpson PM & Enz CA (2006). Conceptualizing innovation orientation: A framework for study and integration of innovation research. *Journal of Product Innovation Management*, 23(6): 556 –574.