

USING THE PRINCIPLES OF MASS PRODUCTION IN THE IMPLEMENTATION OF INDIVIDUAL ORDERS - A HOLISTIC APPROACH

eng. Manasieva, K.
Varna Free University , Bulgaria

Abstract: *Dynamic competitive forces shaping today's business environment, required companies actions to be effective, innovative and flexible. Most of today's consumers require high-quality customized products at low prices with faster delivery. One of the decisions is the reaction to the growing individualization of the demand to make products and services to satisfy the needs of each client with output effectiveness-close to mass. This article aims to highlight opportunities for the realization of individual orders with mass production high efficiency and an integrated approach with application mechanism is proposed .*

Keywords: CUSTOM PRODUCTS, MASS PRODUCTION

1. Introduction

Over the past four decades, industrial manufacturing was evidence of rapid technological and global change. As a result, many of today's companies look radically different than forty years ago, in terms of their financial and technical equipment, their production and business structure and partnerships. The business environment is more dynamic, diverse, complex and unfriendly. This means that the transformation process is complex. New strategies and organizational forms emerged according to trends toward the globalization of markets and competition, innovations in products, processes and technologies, including focus on the core competencies and separation physical and creativity processes , inside the demand-supply chain.

Last but not least, stand changes in user requirements, which contribute to the final and definitive radical change in many industries. In the 90s of the last century, business forecasters and practitioners said that mass produced custom products and services are the future. That would be right, but at the end of the century DELL began to dominate ... Today, hundreds of companies which implement mass customization, are analyzed, because now the challenge to personalize services, hardware and software is history and the experience that is transmitted from those, to all other companies, which realized that the customized production can be effective not only for luxury products.

This article aims to highlight opportunities for the realization of individual orders with mass production high efficiency and an integrated approach with application mechanism is proposed.

2. Actuality of the problem

Consumers today want more than ever goods and services that meet their requirements and needs (Pine, 1993).

While consumers and retailers are looking for more personalized products and services, manufacturers rethink their product and process strategies. A new opportunity for manufacturing and production services is appears and may revolutionize business.

Many manufacturers who have noticed the reduction of product life cycle and product diversification, reduced production volumes.

Limited opportunities for implementing Batch production manufacturing requires medium and small production volumes such as the type of production assembly line remains. This strategy allows to some extent to meet the diverse customers preferences, but caused a significant increase in the production volume, the cost of delivery and storage.

Also, there is the trend in the global market to create lasting relationships of mutual assistance between the manufacturer and supplier for customization. Custom production provides customers with a unique product when, where and how they want it

and therefore it has become , the main method of work. Unlike mass production, custom manufacturing is with small volume, and in most cases, with competitive price and in time delivery. In combination with the most modern equipment and technology as e-commerce and robots, custom production is useful not only for the customer, but it offers exclusive benefits for the manufacturer such as high mobility of the product and delivery and reduced risk of innovations rejection. (www.mass-customization.de).

3. Custom production concept in today's information society

3.1. Strategic Advantages

Mass customization (MC) is a hybrid of mass production and custom production (customization). Given that, the buyers' interests are constantly changing, mass production can not satisfy both producers and buyers. On the other hand, MC systems can achieve the satisfaction of them both, ensuring low product value for consumers.

Practical application of the "Mass customization" concept demonstrates the main reasons for implementing Mass customization (www.mass-customization.de): reduce costs, increase flexibility, open innovations and leadership in innovation.

Today, regardless of the oxymoron content of this production and market trend, scientists and managers develop effective strategies to increase market share and quick profits (Manasieva, 2007) and increasing innovative potential of firms:

- Increasing the market share is achieved by attracting and satisfying customers with product made for them and reduce the amount of unsalable products.
- Quick profit would be achieved if the company is able to: set personalized /custom high prices, increased production capacity, reduced supply chain, free capital, because the payments will grow faster.

Demirova (2011, p.4) claims that "the right choice can be well-defined selection process and includes evaluation of possible solutions to the business objectives of the organization, the total cost, risk and life-cycle and product innovation management ". As for the realization of individual approach to customer satisfaction in terms of mass or Batch production, it requires understanding of strategic advantages, but only if they match the company strategy.

3.2. Basic principles for implementation

Based on the principles of mass production and practice of on demand production, can be argued as shown in Figure 1., that diversity can be achieved only through the implementation of flexibility in production management in general.

Efficiency is another concept engine in the implementation of individual orders. The goal is to achieve performance close to mass production efficiency.

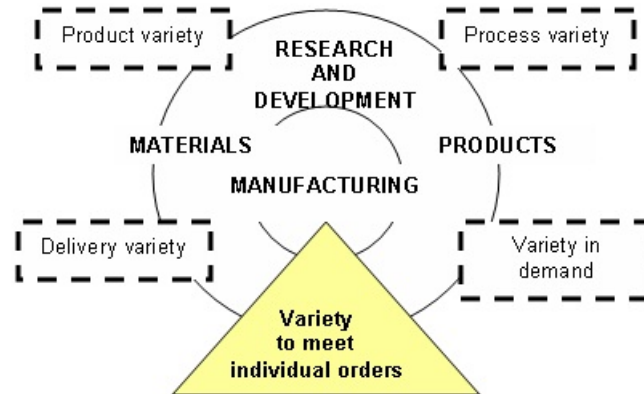


Fig.1. Model of relations Flexibility - Variety

Positioning customers at the center of the design process and their involvement in the implementation process requires research and realization of the approaches dealing with problem. (Cavusoglu and Raghunathan, 2007). The main areas that are the subject of serious research papers are:

- (1) Customer Interaction Management;
- (2) Management of design;
- (3) Logistics Management;
- (4) Information Management.

Modern production today, in the context of consumer integration in the business and production, is related to the term - economy of scale and size. For more general realization of custom production is necessary sufficient information. That information now is available and manageable.

3.3. Feasibility

There are two main problems that can be displayed and which will influence the choice of approach for the realization of efficient make-to-order production or production on individual orders. The first is related to the efficiency and therefore, to the overall organization of business processes. The second problem is related to the achievement of differentiation and product proliferation and leads to customer-oriented strategy and its diverse and unpredictable demand.

1) Differentiation

The idea to create and produce products that meet the clients requirements, inevitably leads to different solutions for external – customer, and internal - the firm, distinctions between the products. The main line is: product differentiation options in the product design match with those that customers want. So, the cost can be differentiated and it will be different from the product value. In each case, however, it comes to the efficiency of the processes.

2) Efficiency

It is realized by avoiding complexity. This means not to increase prices due to production and sales costs of new products and technologies for their production. The strategy is to supply business customers (business - to - business) and consumers (business - to - consumer) with differential, inexpensive product designed with the customer in efficient production. This will be achieved through information and covers all production stages, delivery and distribution.

Surely, implementation of the principles of Mass production, in custom production on demand in an environment of MK or not, means that:

- Technology is essential environment.
- Required specific approach for the differences in philosophy in creating the mass products and individually customized goods and services.
- Implemented with appropriate technologies and approaches.

Just as the microchip revolutionized the computer industry, technology has the power to change industries.

4. Integrated Approach

4.1. Key Activities

Today there are various hypotheses about strategies (types) Mass customization. (Moser, 2007). Advanced technology development, such as non-contact measurement and digital printing, combined with short product lifecycles and flexible production could make the production of customized products economically appropriate alternative to mass production.

Three most common categories allowing custom production with high efficiency of mass production and Batch production are:

- 1) Personalization: individual orders of custom products, with the option to personalize mass produced product: initials, embossed, colored, etc.
- 2) Fit: aimed at personalizing the product's characteristics or user requirements.
- 3) Design: user participates in an electronic way in the design of individual manufactured product that includes both categories above.

Therefore, significant steps can be classified according to the time when users are included in the process. Possible stages of user interaction are:

• Design

Size, style and material are components that can be selected by buyer or seller in the design stage from a numerous of options. Customer demand can be met by adjusting the components of their choice by selecting some parameters. Certainly manufacturers impose consumers' choice limits through market research and offer cost-effective options.

• Production Planning

Production planning and distribution is possible only with the computerization of the company and an electronic link between producer and consumer. Logical step is to use information from sales through electronic data interchange (EDI), or the Internet for production planning in the design stage, before the season and during the current season. Estimated, based on preliminary data requests, are necessary part of the production planning.

• Production

Vendors and other business users can join at production stage if they want to reorder a different size or new material. These small orders can be taken from the main producer, but with new color, material and style modification.

• Delivery

With the advent of bar codes and EDI, information about the supply level is available simultaneously to all traders and manufacturers. This information opens the possibility to supply a single product based on the sales and inventory needs. Delivery process is now short and, technologically secured and retail is revolutionized. In this connection agile supply chains are used (Dimitrov, 2011)

• Adapting an after sales activities

Product individualization can also be done after the sale. For example, products – *do-it-yourself* and online gaming are examples of successful after sales opportunities.

To ensure the efficiency of the whole production process according to the time when users are included in the process, the order penetration point must be set correctly (Dimitrov, 2004).

4.2. Common mechanism of the integrated approach

It can be concluded that the implementation of low-value, individual orders in the mass production environment is possible through systematic approach that includes:

- identification of the factors determining success;
- determination of the factors affecting implementation;
- analysis and evaluation of the environment.

Individual production of custom products can be a manufacturing strategy for enterprises with mass production and marketing strategy for customer-oriented enterprises regardless of the type of production that they produced.

Methodological choice is developed by the author and could be used after examination the real business environment.

Phases forming the common mechanism according to the adapting of the production process to the requirements of individual clients using the principles of mass production are shown on Figure 2.

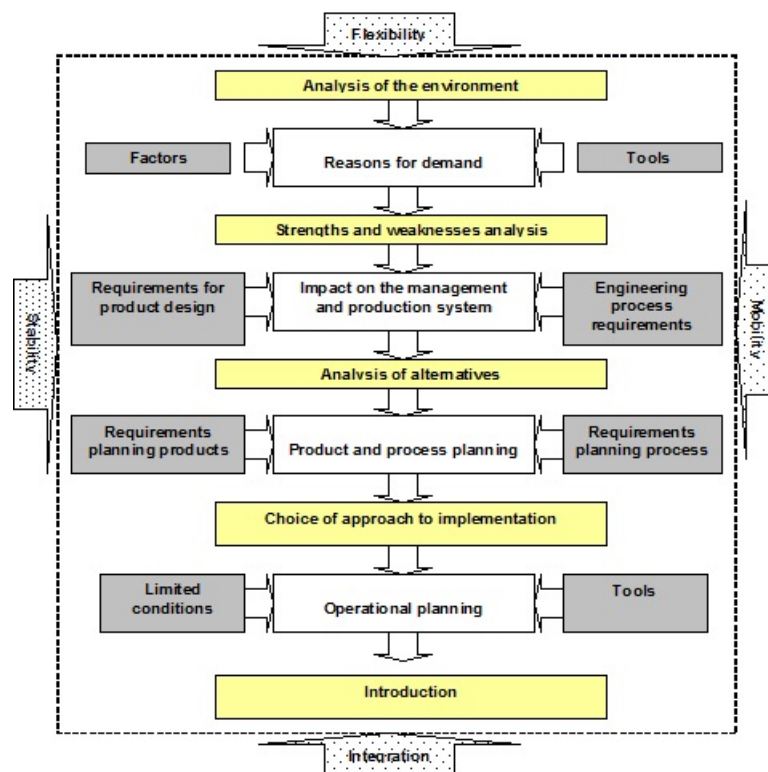


Fig. 2. Common mechanisms of an integrated approach

Methodological choice is developed by the author and could be used after examination the real business environment.

Conclusion

Using the advantages of individual clients' approach for custom production and effectiveness of mass production, allowing users to have access to variety, low-cost, high-quality, user-oriented products and reduced material values and discounts.

Present guidelines are based on the achievement of a comprehensive approach to the implementation of strategies which place customers at the center of business and industry. In today's turbulent environment, such approach is needed, but only combined with accurate and timely actions.

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