

УДК 65;004.01

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## A NEW APPROACH TO MANUFACTURING STRATEGY

*Currently the highest degree of automation of the production process is a computer-integrated manufacturing. Each sub-sections automated production process to aggregate data rates and traditional manufacturing documentation is written to replace this digitalized documentation, respectively talking about without documentation contact. The gradual development of automation machinery production from conventional machines through the NC machine, CNC and DNC management, to flexible manufacturing system PVS and the current efforts of computer integrated manufacturing CIM.*

**Keywords:** manufacturing cell, transport system, CIM

### 1 Introduction

For the current economic environment is characteristic by that enormously increases the sharpness of competition, is a variation of the products, the suppliers are changing their policies, and shortens the life time of the product, reduces the delivery time for a new product on the market. Space for this competition is open to businesses with a strong innovative capabilities that their products offer according to individual requirements. The success of bringing in flexible manufacturing systems. The modules are structurally compatible, but their functions are different. This will allow for a short period of time from a few standardized parts to construct several different functional solutions.

One of the most important study of the arrangement of the production in the enterprise has in recent years become a cellular production. These studies include a number of methods based on finding the session component, which would guarantee the production of cell-relationship of different components with a small number of pieces in the lot. Cellular structures are the link between machines, saving time and space. Operation of the machine is synchronized, rapid flow of materials (moving parts from machine to machine is a short distance). Production cells combine and discusses many of the benefits of other types of production. Great development and trend of see in recent years in CAD/CAM systems. CAD and individual modules are now commonly used to speed up the work. Visualization programs allow us to monitor the progress of activities in each of the screens on graphics work. Visualization allows you to look at the processes of "visibility-visibility" beyond their own traffic, for example. for the occasional business manager for a service business line status, whose facilities are located in the line and keep track of their functionality, diagnostic and other data and where necessary, as well as interfere with their operation.

The advent of the Internet is dramatically changing the environment of the production. The implementation of Web technology moves to integrate into production systems is called virtual races. With this rapid information technology we can exchange data on production and products all over the world 24 hours a day, and regardless of the place and time. The Internet allows for effective cooperation and interaction at a distance on a global scale. Through the Internet it is possible to provide the operating instructions without physical presence of the production systems.

The Internet not only allows quick access to its ability, but also their rapid transfer. Local production and regional trade is becoming global. The relationships between suppliers, producers, consumers, which have so far been "personal" to become virtual. Through the Internet, you can run the activities of the system, inform all interested parties about what is happening and what has happened.

Potential of the Internet is also a visualization of production data online, according to which the operator can quickly optimize the process, set the parameters, remove a malfunction, and the logistics of it according to real conditions. The data obtained are accessible for

the operator of the system, as well as for maintenance staff, quality, training, production, management and operation of the Department and can be presented in different environments. Such historical data, such as. How many products is produced, how much is consumed, what is a work-in-progress material, can help you decide and negotiations with the so called occasional users, such as. traders located outside the executives own business. The Internet eliminates barriers to integration of traditional manufacturing and production agility supports. The result is the ability to quickly respond to changing business conditions.

## 2 A new perspective on the classification of flexible manufacturing clusters

A new perspective on the classification of flexible manufacturing cells and systems introduces their group based profiling technology, on the basis of which is looking for a similar group of components requiring the same machines. On the basis of this approach are used four types of flexible production clusters illustrated in figure 1., which define b. Maccarthy and j. Liu [1-4], namely:

- **Single Flexible Machine – SFM**,
- **Multi-Machine Flexible Manufacturing System – MMFMS**,
- **Flexible Manufacturing Cell – FMC**,
- **Multi-Cell Flexible Manufacturing System – MCFMS**.

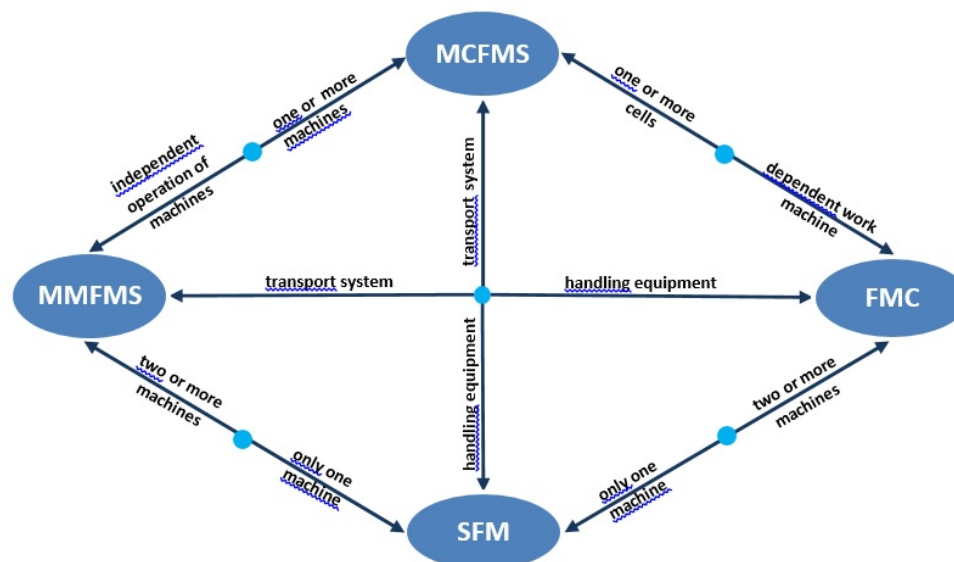


Fig. 1: Graphical interpretation of the definition of flexible manufacturing systems

- **Single Flexible Machine** - is defined as a production unit created by the NC machine, handling facilities for the exchange of the objects of production.
- **Multi-Machine Flexible Manufacturing System** - it is seen as a grouping of multiple production machines without the interdependence of their activities. They are autonomous, but functional connectedness is possible, for example, the flow of material transport system. Machines are autonomous and their activity is not dependent on the activities of other machines. They are mainly machining centres, special operations, such as machines for the production of gear grinding operations, and so on. The hallmark of their work are no longer operating times.
- **Flexible Manufacturing Cell** - is a production system, created by grouping multiple NC machines, designed for a particular group of components with a similar sequence of operation or for a certain type of surgery. The hallmark of the cells is the mutual information between machines and material. Usually used for handling common handling equipment interoperation.

- **Multi-Cell Flexible Manufacturing System** - it is made up of a grouping of multiple production cells or cells with a diameter and flexible production machines. A characteristic feature of this system is the existence of a intercellular of the transport system as an integrating element.

Disparity between the following defined boundaries between them can be graphically and visualize clusters of production according to the figure 2. under this scheme can be every production system, a large or small, with the flexibility to incorporate any type fulfils the requirement. From the classification, it is clear that the two categories of production systems, flexible production machine type as the easiest and flexible production cell, are the basic production units and a group of machines and multicellular are the combination of the grouping. Another hallmark of the flexible machine cell and is also that they have "their own" autonomous driving. For the above grouping, multimaschines, and multicellular is the characteristic that they have a central control system. Presented the classification scheme is based on a consistent set of definitions and grouping production defines the relationships between the different systems and the boundaries of and inside the systems. The defined relationships lead to a hierarchical model for different types of flexible production and become useful in solving problems, in particular, management of production tasks, location and disposition of material scheduling and information links.

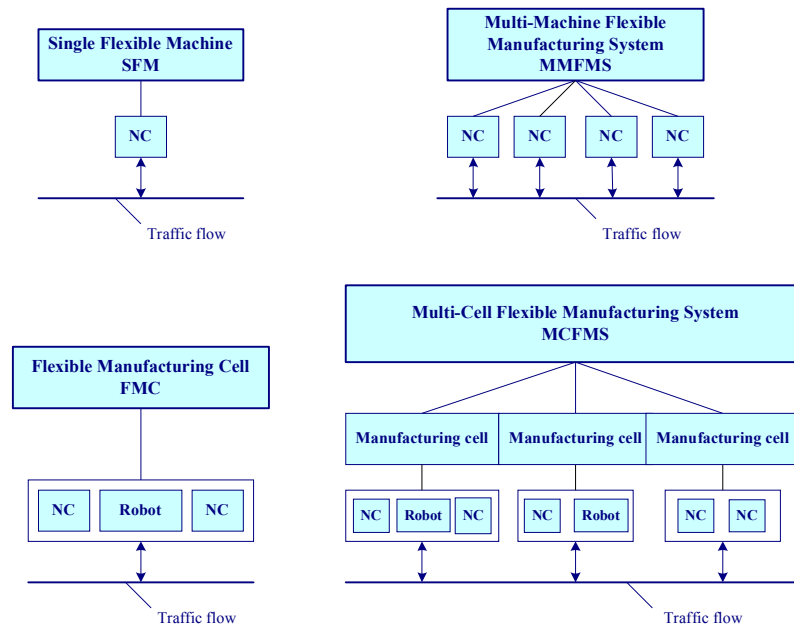


Fig. 2: Configurations of flexible manufacturing systems

Despite these advantages, the following definitions should be considered to be relatively narrow. In fact, today, are starting to show a lot more definition and high technology centres of their nature be understood in greater coherence with the surroundings. There is an effort to understand these concepts from the perspective that brings new opportunities and trends to their computer, CIM application in production and their inclusion and functions in the logistics chain [1].

### 3 Development of computer integrated manufacturing

Higher quality is the basic demand of the customers who want their money be worth for the products they buy. This applies to both consumers and industrial customer. The improved quality can be achieved through better design and better quality control in the manufacturing operation. Besides the higher quality demand, customers are not satisfied with the basic products with no options. There is a competitive advantage in having a broad product line with many versions, or with a few basic models that can be customized. A brand new concept in

manufacturing is to involve users in the product design, with the aid of design tools or modeling box, the company will allow the users to design the products with their own favor.

The current situation in the industry of developed countries can be characterized as a period of diffusion of microelectronics and microprocessors in all industrial sectors. Technical progress is accompanied by the growth in the complexity of the products, is growing at a constant pressure on the producers that the products have been developed and selected in a shorter period of time, with minimal cost and with the required quality. The pressure to shorten the innovation cycle is determined by the customer, in particular, which has not produced the product in bulk. Flexible production has evolved on the basis of the successful development of NC machines of robots, especially in computer management. Achieving flexibility of production enabled the ability to link NC machinery transport and manipulation devices without solid ties. The idea of automation here remained as the main paradigm continues.

In the current development of the prevailing production terms:

- **CIM** – Computer Integrated Manufacturing,
- **FMS** – Flexible Manufacturing System,
- **FMC** – Flexible Manufacturing Cells,
- **GT** – Group Technology,
- **CAD** – Computer – Aided Design,
- **CAM** – Computer – Aided Manufacturing,
- **TQM** – Total Quality Management.

Most of the attention in the CIM was dedicated to the technical, technological and operational challenges. CIM of the critical strategic tasks of the company represents the expected of him:

- reduction of material and energy intensity,
- reduce the times,
- increase productivity at work,
- increase the quality of products and production,
- increasing the use of production equipment,
- improve the coordination of the activities of the organization at all levels.

Another incentive for the CIM is based on the gradual integration of the aspect of NC machines, robots and computers into automated production cells, which have resulted in the gradual elimination of a man from the manufacturing process. CIM based on an attempt to exclude the person from the approaches to the production and achieve the desired flexibility and reaction speed to changes are incorrect. The man to meet these requirements is necessary, and to do so in the implementation of the production processes, as well as in their reconfiguration [2].

The reasons for the integration of new structures of production resulting in particular from a man in the following points:

- many activities is not possible technically cover,
- many situations so far knows only one rate,
- many decision-making processes are too difficult to automate.

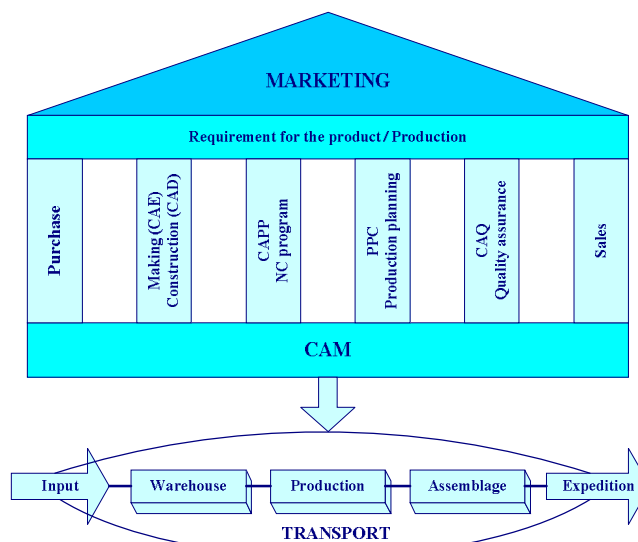


Fig. 3: Model CIM

Furthermore, its efficiency in the system, in the preparation of and supervise shows programming of workplaces, for special handling, for example associated with high sensitivity, for work in confined space and many more. The importance of a flexible production we have seen already, in particular in the integration for the production of a diverse range of automation components with low-dose options. Flexibility is not being achieved by NC machines, you may also have the traditional organization of production, but the structure of their grouping with transport and handling link without solid ties.

### Summary

In examining the benefits of CIM, raises the question of what are, if we realize that construction required a high investment and many times they are used on the same machine, even with the same times operations. It is rather impressed with the so called zero effect and it seems that the path to higher productivity should consist in the introduction of high technology. In the past, namely, the development of production was determined by the cost of production, and technology has been an important means of reducing them, but in the current conditions of technology is no longer the primary means of increasing competitiveness. Today is the time. But despite the gains expected from these projects came very slowly. Projects put into operation did not meet expectations in terms of costs, deadlines, dates of production, achieving compliance with entry into service planned performance and flexibility. Despite this lack of today, there is no doubt about it, whether to build a flexible production. Approaches are reviewed and how one serious argument showed the absence of taking into account the importance and functions of the man in the production system [3].

CIM was known as a technology, but the idea remained here to continue as the main automation paradigm.

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*This article was created within the grant project VEGA 1/0124/15 Research and development of advanced methods for virtual prototyping manufacturing equipment.*