



FACTORS AND REASONS INVOKING THE RE-PROPHILITATION OF THE PRODUCTION INTO THE CELL STRUCTURES

Vladimír BALÁŽ - Michal ŠULÍK

Abstract: Production systems are organized according to the type of production. It regards the interconnection of the means of production with the flow of the product. The basic difference in solving production system is determined by the type of production - in large batch mass almost always use production lines.

Keywords: cell, structures, production

Introduction

The principal priority of the company is the sale of the products or services. However, there is severe competition on the market and it is very difficult to weather out on so demanding market. Even more difficult is to enter such market. The market is characterized by the continuous cycle of the changes and uncertainty. The level of the uncertainty is still growing, which is objective fact and phenomenon existing in the recent modern market economy. The recent economical environment may be characterized by the fact, that there is enormous growth in the vigorous competition, new products and new manufacturers emerge on the market rapidly, new suppliers and their conditions fluctuate, extended is functionality of the products, the time of products usage shortens and the term of new product delivery on the market shortens as well, Fig. 1. It is caused not only by the demanding requirements of the clients, developments in science and continuous emerging of the new competitors, but also by the aspects of the economical and social development and problems arising in the society.

Factors and reasons invoking the re-prophilation of the production into the cell structures

Recent turbulent changes bring about such phenomena that the opportunities at the market arise quickly and also quickly disappear. This means for the company uncertainty and risk. Necessary becomes not only the skill of the managers to recognize as soon as possible the new market voids, but for their fast occupation also the skill of the flexible and fast manufacturing adaptation. It is quite logical that company is forced to alter the recent manufacturing strategies and orientate them so that its competitiveness is strengthened and achieved is the economical effect. Each company, if willing to face successfully the attack of the problems so from outside as from inside, must adopt such strategies, based on which it will be able to react rapidly on the opportunities, which uncertainty brings.

Under strategy understood should be the goal oriented generation of the future status and goals of the company, mainly from the point of the products selection which will be produced, of the manufacturing technology and markets where they would be sold. The higher quality of the strategy, the more significant success would be. The company creates through its strategy the prerequisites for the long terms growth and at the same time executes such operations, which bring also the short term effect. However this idea may be also understood oppositely:



based on its strategy the company carries out such operations which bring the short term effect and at the same time generated are the prerequisites for the long term development.

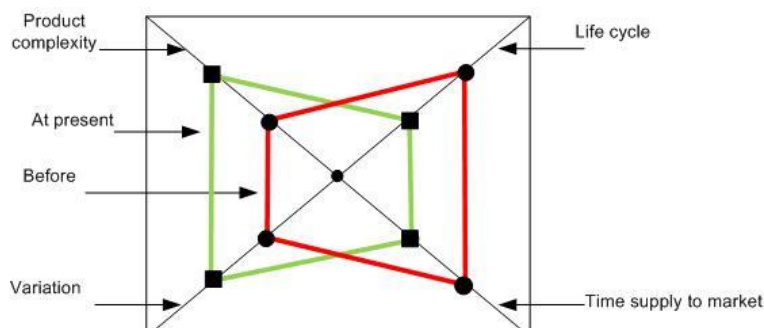


Fig. 1 Changes in product characteristics

The selection of the strategies at the present time is determined by the conditions of the market. The strategies related to the production, should they be successful, must respect the fluctuation of the conditions on the market and to re-profile the production based on the new approaches. The new manufacturing technologies and philosophies, as the group technology, manufacturing cells, JIT, robotizing, CIM, have recently emerged. They call for new models and approaches should they be applied successfully. It is rational, that the company directs its strategy in that direction, that through its exploitation strengthens its competitiveness and gains the economical effect.

Strategies to achieve the competitiveness and the flexible manufacturing call for:

- rapid adjustment to the new product
- rapid satisfaction of the client
- high quality
- adequate price

Until present time applied manufacturing strategies were based on the production with the objective of their effectiveness, however at the present time, should they be successful, they have to concentrate on the client, Fig. 2. While until present time, it has been the client who was to adjust; now it must be the manufacturer.

The flexible manufacture differs from the present manufacture in three principles:

- Size of the series, i.e. achieved are the low productions costs and short times for the machine and cell set up in case of the change; even in case of the small number batches
- Material flow, i.e. achieved is the execution of maximum number of the operations in one spatial unit
- Variability of the activities, i.e. achieved is the ability to produce in time, to react on the changes between the order of the inputs and outputs of the material flows and information, and to determine the order of the operations as well

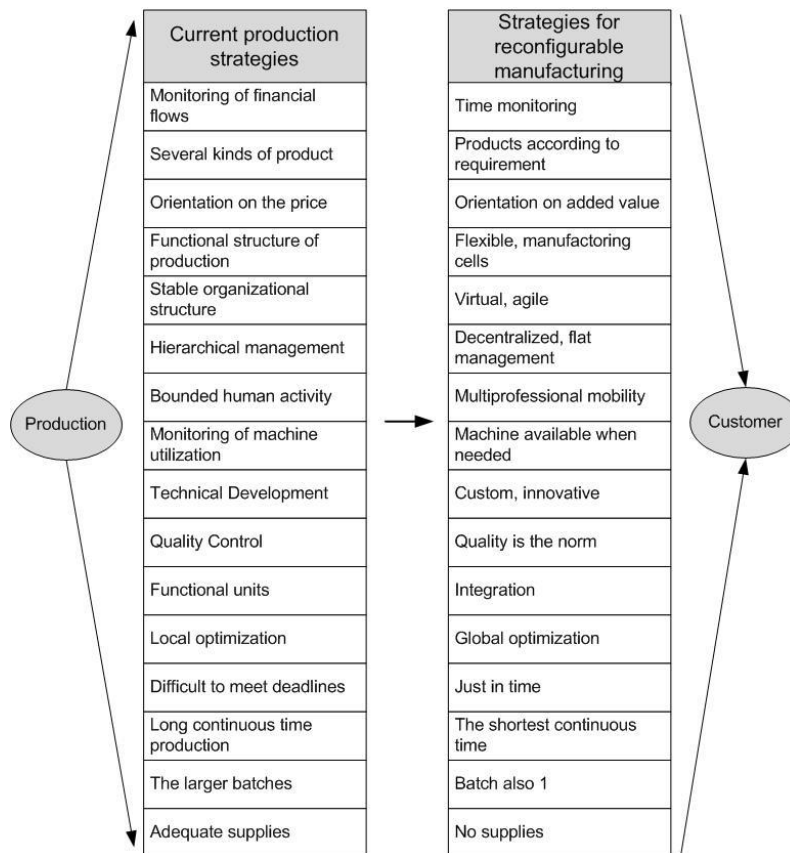


Fig. 2 Change production strategies

Reason for the recent structure of the manufacture re-philosophy in the manufacturing cells is to achieve the higher competitiveness. The manufacturing cells have shown to be as one of the efficient manufacturing strategies in so rapidly changing economical environment. The major reasons for the cellular manufacture are as follows:

- Reduction in the current manufacturing time,
- Increase in the parts/products quality,
- Reduction in the in-process manufacture,
- Reduction of the transport routes and times,
- Increase of the flexibility,
- Simplifying the planning and production control
- Reduction of reserves,
- Reduction in manufacturing costs,
- Ability of the immediate reaction to the market demands,
- Higher machines usage,
- Shortening of the set-up time,
- Achieving the higher work-shift,
- Reduction in the material and manufacturing documentation circulation,
- Reduction in the material volume in store,
- Saving of the manufacturing area.



In general, a mass production system is most appropriate for parts with high demand and low variety. A functional production system is best suited for a product mix characterised by high variety and low demand, while a cellular manufacturing system is in the middle and has more flexibility to adapt to product variety and demand. A comparison of different kinds of manufacturing systems based on their production rate and production variety is illustrated as in Fig. 3 (Black). Agarwal and Sarkis gave a recent review and analysis of the performance comparison between functional and cellular manufacturing systems. The review reveals contradictory results from previous simulation and empirical studies and shows the complexity of the evaluation and the simulation of the systems.

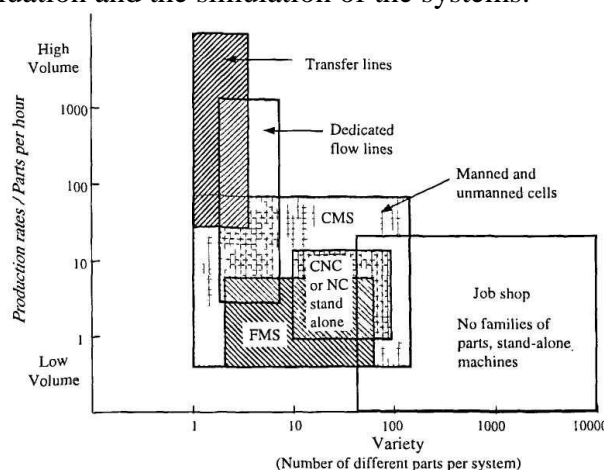


Fig. 3 Change production strategies

Conclusion

The cell production of the phenomenon of technological arrangement which may be significant benefits for a broad simplification of the management of the flow of parts to the extent possible, by reducing the labor costs of the production process and inventory planning technological level delegation, responsibility for the quality and maintenance of way that can be firmly identified with responsibility for production performance.

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Contact

Ing. Vladimír Baláž, PhD.
TUKE-SjF Department of Robotics
e-mail: vladimir.balaz@tuke.sk