ANALELE UNIVERSITĂȚII
"EFTIMIE MURGU" REȘIȚA
ANUL XIV, NR. 1, 2007, ISSN 1453 - 7397

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The Flexibility of a SFF

The flexible production systems have appeared due to the necessity of exigencies and performances growth of small and medium series production (even unique parts production). Their development represents the result of a more than 100 years of evolution, consisting in an answer way to the mutations appeared in the economical medium in which they activate.

1. Introductive elements

In them ensemble production systems are always changing, and this change is determined by a series of convergent factors who leads to a lonely goal: to realize cheep high quality products without pollution. Those factors are the effect of globalization, of the reduction for lunching period of a product on market as much as of the lifetime of a product, of taking care of the environment, of the grow in the informational power of communication networks.

That way, the organizations take new technologies for being competitive. That thing makes possible the emergence of a new production systems like flexible production systems, integrated production systems, integrated production systems based on knowledge.

Flexible production system is a stage in classical production systems that go to advanced production systems.

A very important part of a production system is fabrication system. In flexible production systems it doesn't take place an essential change of the role and place of fabrication system, but it changes the way of answering for production goals witch are more divers, conditioned by efficiency and competency.

Fabrication flexible systems appeared when the necessity goal of growing the performance of small scale production and middle scale production at high level, knowing that approximate 80 % of actual production is like this kind of series.

Flexible systems may be different forms and very different destinations, from production with high cadences to the production that create prototypes.

The problem of fabrication is very large and doesn't assure a unique solution.

Flexible production system has been made through:

- the application of numbered command at tools;
- the development of auxiliary technologies needed for making automatization;
- the introduction of the PC for the commanding of the system.

2. Flexibility grade in one SFF

The global appreciation of flexibility grade in one SFF can be done through out the number of kind of pieces witch can be made with the system, although it isn't eloquent enough, because it doesn't took care about the quality aspects of different kind of products.

A more precise appreciation of flexibility grade of a SFF could be done through the different possible states number of the system, taking care about the time and expensive needed for realizing the adaptation of the system in the new state.

For the project man of this system is important to know the physical component of the system and what demands may satisfy for obtaining a grade of flexibility. From this point of view, the flexibility of a SFF determines two important components:

1. Flexibility of the hardware structure of the system
2. Flexibility of the software structure.

Changing the type of made piece in SFF is presented in figure 1.

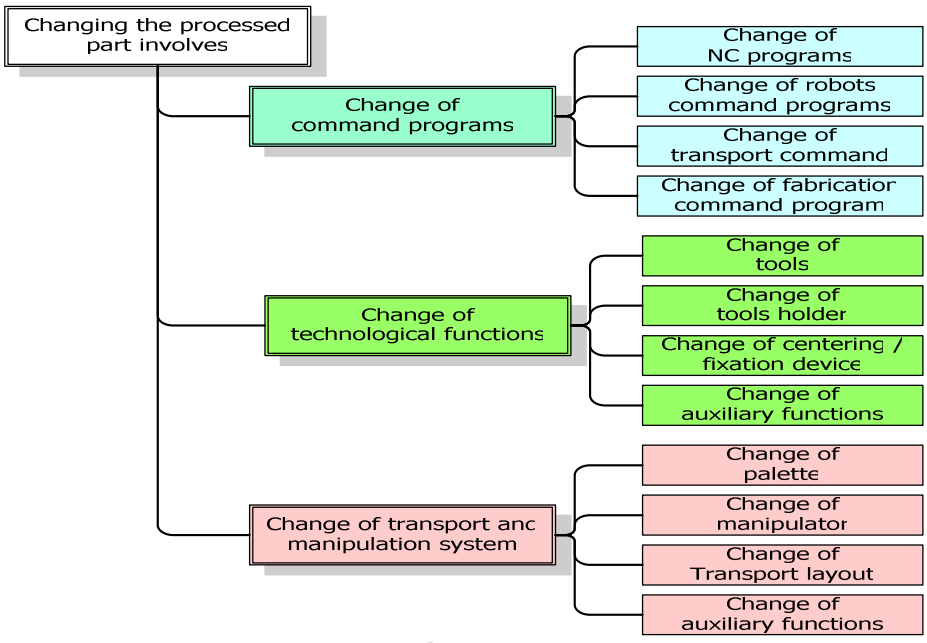

Figure 1

The flexibility of hardware structure system is determined by three components (figure 2):

1. Flexibility of technologic subsystem
2. Flexibility of deposit subsystem, transport and manipulation
3. Flexibility of informational subsystem.

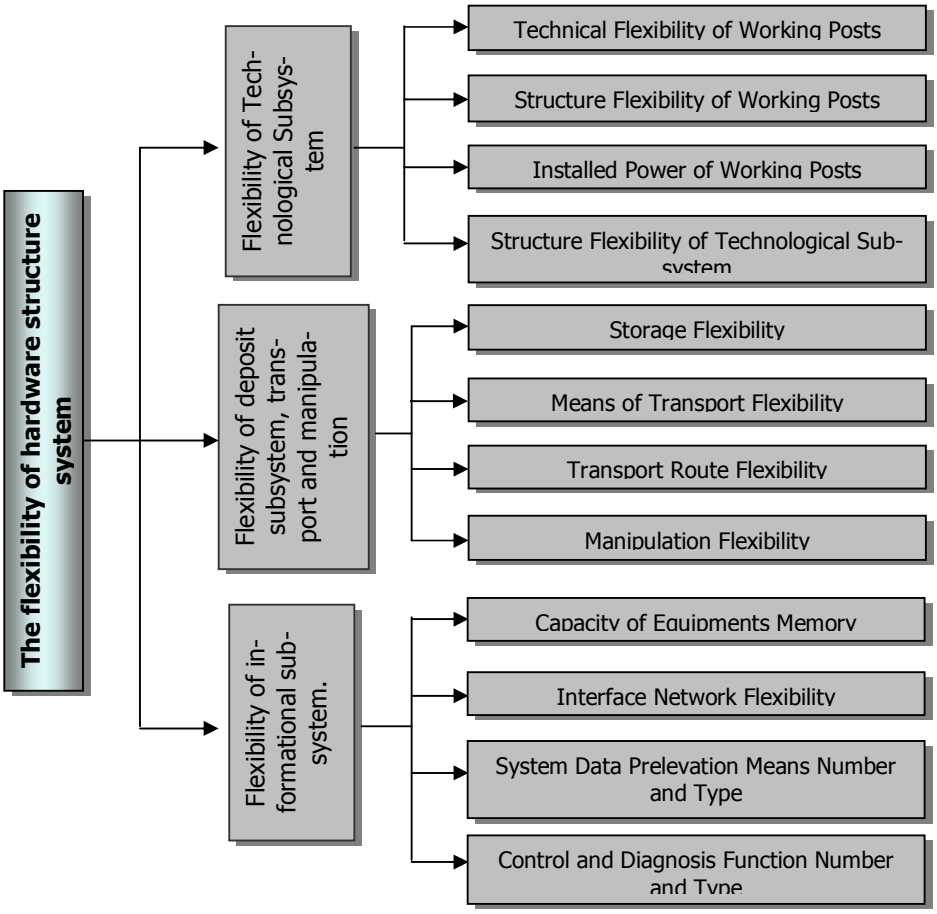

Figure 2

Flexibility of software structure is obtained by fast elaboration of the big number of remaking programs, but especially by a big flexibility of schedule planning, and of the leading operative programs of the production.

3. Conclusion

The companies who wish to introduce new technology and flexible systems in production process deals with important problems in the process of economic justifying of implementing those systems.

The problems who appear are determined by the not existence of a quantifying financial - accounting system and of all the advantages in introducing those flexible systems.

The difficulties are determined by the fact that:

- The advantages of introducing flexible systems are quantitative nature, which can be easy evaluated, but also quality nature, the strategic kind, whom evaluation and economic measurement can be difficult.
- The correct estimation of function time of investment in flexible systems is a critical point
- Decisional risks are connected to the precision grade of estimated results.

References

[1] Anderson, D., Sweeny, D. J., Williams, T. A., An Introduction to Managerial Science. Quantitative Approaches to Decision Making. 6th Edition. West Publishing Co., 1991.

[2] Habchi G.,Berchet C. Le Pilotage Industriel : Concepts de Base pour une Approche Intégrée. RFGI, Revue Française de Gestion Industrielle, Vol. 18, N° 2, 1999, pp. 55-72.

[3] Savi, Gh., Cojocaru, G., Flexibilitatea în fabricaţia de maşini, Timişoara, Editura Facla, 1981

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