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REDUCE TIME MANUFACTURING IN FLEXIBLE SYSTEMS BY REDUCING RISK FACTORS

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Abstract. *In presented paper will show how we can reduce manufacturing time in flexible manufacturing systems by increasing the flexibility has the effect bad reduce programming time. The case study presented will integrate all operations involving processing stations to be served simultaneously activated and transfer system and increasing flexibility has the effect of changing tools and devices setting. Improving transport and storage of materials leads to lower production down time and unfinished. Length control and optimization of processing operations have the effect of directly reducing operative time. If the risk is underestimated, the protection will be insufficient to cover losses and if overstated, the cost of protection will reduce the excess proceeds of that business. So by identifying and minimizing risk factors will establish an optimal level of production.*

Keywords:.*Flexible manufacturing system, Risk, Production capacity, Degree of usage.*

1. INTRODUCTION

Risk is defined as an uncertain but possible event that appear permanently in the process of technical, human, social, political, events, reflecting the changes of possible results distribution, the probability to happened according to subjective and objective values and having possibly damaging and irreversible consequences [1,2]. Other ways to define risk are [1]:

- the chance to lose
- possibility of losing
- uncertainty affecting the outcome
- actual dispersion expected results
- multidimensional concept that can not be reduced to a single element or a single figure.

The degree of manifestation of risk is directly related to the probability of achievement and therefore there is a risk severity classification (Fig.1).

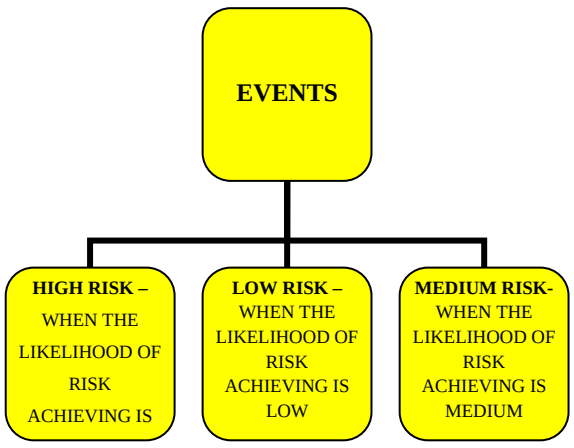

Fig.1. Events classification on the basis of the seriousness involved in their realisation

Risks can be internal or external. In the internal risk we will show that the technology risk, the production risk, the innovation-

modernize risk describe technical and incompatibility between old and new technologies, the inappropriate application of the innovative modeling-simulating results using information technology.

Technological risk appears as a result a failure in modernizing and innovating in the production process. It refers to aspects such as reliability, the aesthetics of manufacturing products or of technologies, the efficiency of computer system in the production. The manufacturing risk has as components to using or developing new technologies. Risk of innovation and modernization may appear as a result of the transfer of technologies, through proprietary innovation or applications so may not be able to offer their services and products made under license, the website programs at parameters project, at the same level as developed countries. Technical risk is present in information technology where the internet may give signs of technical risk (Fig. 2) reduction addresses available, races-search saturated, difficulty of installation and configuration.

Risk identification is fundamental for the establishment of an optimal level of protection for a specific international business [3, 4]. If the risk is undervalued, the level of protection will be insufficient to cover losses, and if it is overvalued, the costs of excessive protection will reduce the excess gain obtained from the business concerned.

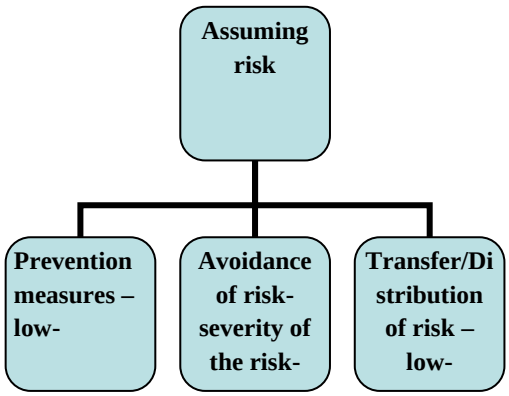

Fig.2. Presentation of main alternatives in the management of risk

2. ANALYSES

The case study that is analyzed is treated as a separate project taking into account the fact that any modern activity it is considered as a component of a project deals with project management methodology with rigor and flexibility of a successful outcome.

The case study on the reduction of manufacturing time in flexible systems, by reducing risk factors is carried out on a flexible manufacturing system presented in figure 3. The flexible system is composed of:

1. mill;
2. lathe;
3. robot;
4. two storenhouse of semi-finished parts;
5. transport system loading/ unloading the parts gross semi-finished and finished parts.

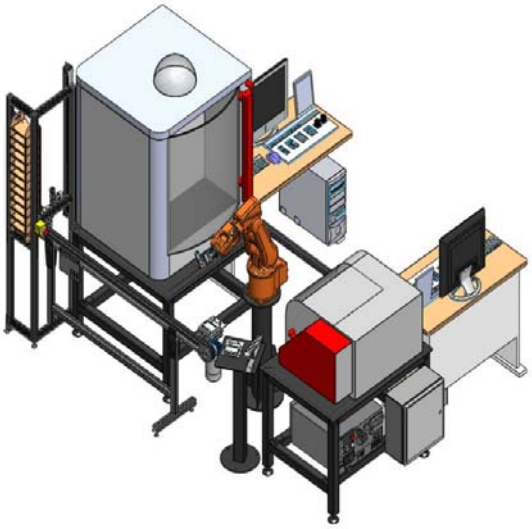

Fig.3. Flexible system for case study

It is considered that this system of manufacture can operate 65 hours/week at full capability of the production, at the rate of production Rp= 20 products/hour. In a week there have been obtained 1000 products of high quality. There be determined the degree of usage. The degree of usage is a percentage parameter that refers to the quantity of products obtained actually in relation to the

actual capacity of production of the system of production:

$$U\% = \frac{finished\_products}{the\_production\_capacity} \quad (1)$$

In the case studied the production capacity of the system of manufacture is:

C_p= 65*20= 1300 products/ week (2)

Use the manufactured system in the week which has been analyzed is:

$$U\% = \frac{1000}{1300} = 76{,}92\% \quad (3)$$

The result of actually time processing for 1000 products is:

$$O = \frac{1000\,products}{20\,products/hour} = 50 hours \quad (4)$$

$$U\% = \frac{50}{65} = 76{,}92\% \quad (5)$$

Other objectives of flexible manufacturing systems consist in increasing production capacity (C_p) without increasing the number of employees.

To increase flexibility, total global control of the manufacture and all computerized information that are closed to 100 %. (tab.1)

Utilization ($U_{\%}$) is important indicators reflecting automation performance. Percentages close to 100% indicates a good automation, efficient use of equipment and personnel and the economic need for developing the manufacturing system.

Table 1. The strategies of automation performance indicators

Number	Strategy	Increase
1	Specialisation operations	< U%
2	Combined operations	< U%
3	Simultanious operations	< U%
4	Integrating operations	< U%
5	Increase flexibility	U%
6	Improving transport and storage	< U%
7	The on- line al execution	< U%
8	Time control operations	< U%
9	The global control of the manufacture	U%
10	Computerized information processing	U%

3. CONCLUSIONS & ACKNOWLEDGMENT

The on-line control of execution will entail the replacement of inspection and unique final testing, with inspections and tests carried out on flow tests. As a consequence there is a growth of the savings due to the substantial growth of the chances to remedy a possible processing failure and the drastic reduction of the finished products that are discarded.

The control of the length of processing operations and their optimization has as direct effect the reduction of operating times and implicity the possibility obtain a higher operative production volume with the same equipment. The global control should ensure the global optimization of all available resources in a manufacturing system.

The most of the products involve hundreds or even thousands of stages in processing; using combined operations determine design and using some machinery and dispositive carrying out several phases of processing, thereby reducing our times efficacious in transport adjustment. Simple or combined operations must be performer simultaneously (as far is technology possible), thereby reducing total manufacturing time.

The integrate operations assumes that all the processing stations to be activated and shall be served simultaneously by the transfer system and increase flexibility has the effects the reduction programming times, adjustment, changing tools and devices. Improving transport and storage of materials lead to the diminishing times as well as the unfinished production.

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