

# 1TH INTERNATIONAL WORKSHOP "ADVANCED METHODS AND TRENDS IN PRODUCTION ENGINEERING"

## PRELIMINARY COST VALUATION OF JOB-ORDER

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***Abstract:** There is a great meaning of cost determination in enterprises. Nowadays it is mainly realised by experienced peoples oftentimes without computer support. The subjective influence is great and afterwards decision about acceptance of a offer is not economic effective. It is necessary to elaborate a methodology for cost valuation of offer as an important tool for CA systems. The paper presents aspects of developed cost valuation system.*

***Key words:** rapid cost valuation, CA systems, group technology*

### 1. INTRODUCTION

A company may make hundreds or thousands of different parts. Because the parts are made in a concrete manufacturing environment, many parts are similar in some way. Each part is made according to a process plan. Therefore many process plans must be also similar. It is possible to state as many engineering parts are similar afterwards many production costs must be also similar. If similar parts are situated in one group, their process plans and production costs are similar as well.

Engineers can use the Group Technology (GT) philosophy to avoid redundancy by retrieving previously completed items for re-use. This saves design, planning and project time and contributes positively to time-to-market. Especially CAPP (Computer Aided Process Planning) systems based on GT are very wide-spread in engineering industry.

GT emerges as one of the prime forces that will integrate the engineering and manufacturing processes. Benefits from GT implementation have great importance for a company. Large cost saving can be achieved by GT implementation in production planning and control, process planning, tool design and facility design. Consequently it is suitable to implement some of GT program types.

Similarity as one of important property is utilised in GT methods. Especially similarity is used for retrieving of parts from classification systems. It is possible to state that similar reasons have similar implication. That means that similar properties of engineering parts indicate similar process plan and consequently similar cost too.

### 2. PROBLEM OF COST VALUATION

“To receive or not to receive” the job-order is standard question of human evaluator in the enterprises. Receiving determination is based on subjective taking measure of job-order. There is experience that difference of cost valuation for concrete job-order among human cost

evaluators is 40%. The human cost determination is not realized according systematic analysis but according human opinion based on long-time production experiences. Real cost monitoring is uncertain and consequently control effects are very small. Costs originate in all processes of enterprise. Total costs are result of all activities and processes from development to product expedition. As costs are very related to financial profit, it is needful to decrease their. Real costs originate in real condition. There is no information about real costs before receiving a job. However management has to decide to receive or not receive the concrete job. Management has to assess a preparatory cost valuation. Cost calculation and cost estimate are important inputs for decision about job receiving.

### 3. DEVELOPED RAPID COST VALUATION SYSTEM

Accordingly the above mentioned problems of job-order cost valuation there was effort to utilise software to increasing time to valuation and increasing of desinterestedness. The CA systems seem to be a very good candidate for the cost problem solving. The research team from University of Zilina and ATH in Bielsko Biala has developed the system based on GT solving the task of cost valuation of job-order.

There is concept of Rapid cost valuation based on CA (Computer Aided) support.

The developed methodology is based on the following aspects:

- Similar engineering have similar process plans and consequently similar production cost,
- Group Technology (GT) is very good sophisticated tool for area of similarity,
- Majority of engineering parts of job-order is similar to produced parts,
- There is a section of parts dissimilar to produced parts
- CA system based on GT is utilised for cost valuation of similar engineering parts,
- For similar engineering parts are retrieved process plan of similar produced part
- Exact methodology based on expert system is utilised for dissimilar engineering parts,
- For dissimilar engineering parts are generated frame process plan.

Rapid cost valuation based on hybrid methods (group technology and exact methodology) implements a coding and classification scheme by which a process plan for a previously

planned part is retrieved. The retrieved plan is based on the similarity to the new part. The retrieved process plan is then manually modified as required for the new part design. There is high probability that similar parts have similar process plans and similar costs. This is a basic assumption of utilising the GT process planning method.

GT methods assume that the user is able to determine the appropriate classification codes needed to retrieve appropriate plans, and that plans exist and include features which are

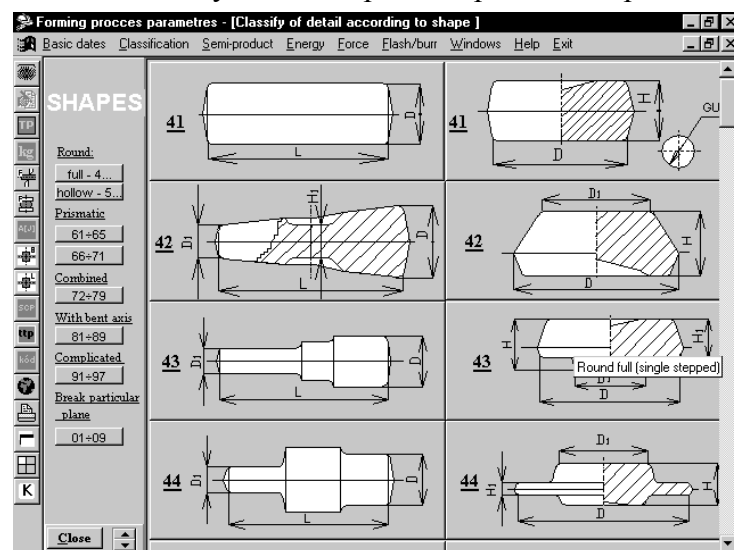


Fig.1 Developed visual classification according the shape of parts

closely analogous to those of the new part.

The computer is used as a tool to assist in identifying similar process plans, as well as in retrieving and editing the plans to suit the requirements for specific parts. According retrieved parts is determined production cost.

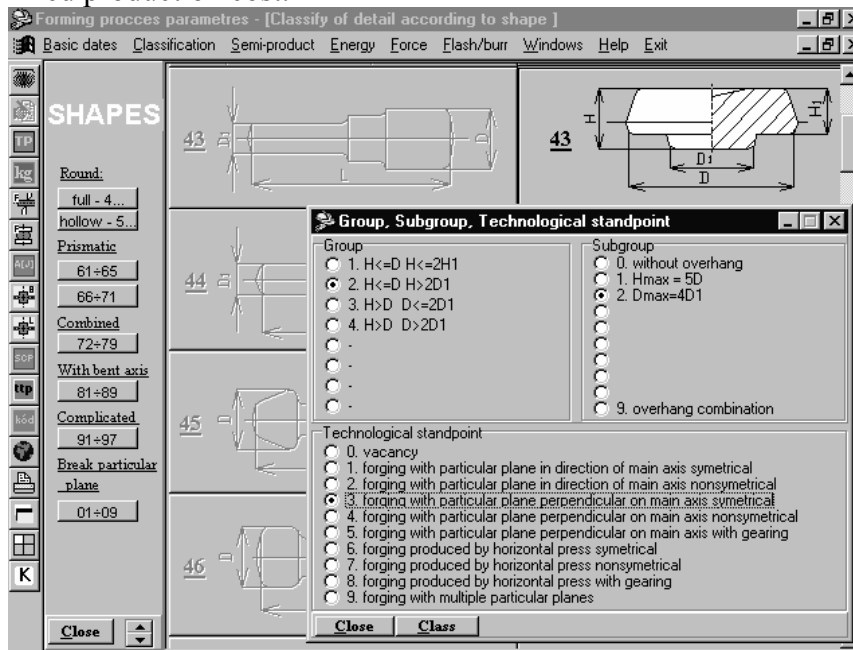


Fig. 2 Next step of classification according non-geometrical properties

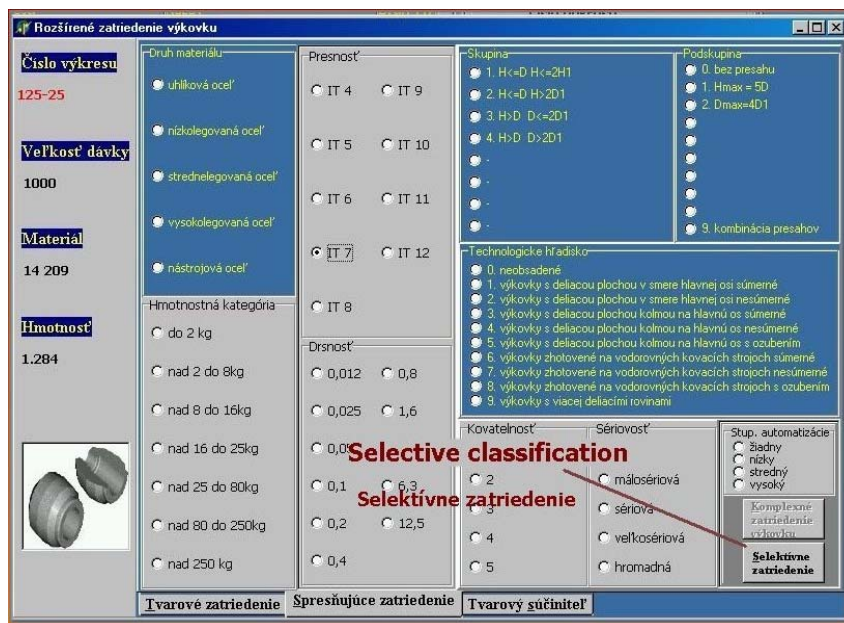


Fig. 3 Selective classification according important part properties

#### 4. CONCLUSION

Developed CA system for cost valuation is based on GT. The GT method enables quickly retrieving of similar process plan and recalculating of production cost. It is not necessary to elaborate a process plan as a base for cost calculation before receiving job-order. Therefore

the developed method is very time quickly, flexible and needful for competitive environment of engineering enterprises.

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