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SOME REMARKS ON THE ERP SYSTEM APPLICATION

Since about ten years the market of Enterprise Resource Planning (ERP) systems is rapidly growing and producers of the systems each year propose a new solutions to support business activities. The information about new possibilities of the ERP packages and about successfully implementation of the software imply the following decision in a firm: "We need the same – the ERP system can solve all ours problems! " The decision about implementation of the ERP system in a firm is a strategic decision and must be accepted on the all levels of the management hierarchy of the enterprise. All the potential users of the ERP systems must be aware that the implementation of the ERP system is expensive ,time consuming and generate disturbances. The paper show practical problems that appeared by the implementation of the Enterprise Resource Planning system in medium enterprises.

1. INTRODUCTION

Enterprise Resource Planning (ERP) applications are software suites help organizations integrate their information flow and management of business processes. They typical support the different departments and functions in the organization by using a single database that collects and stores data in real time. The implementation of the ERP system improve the business organisation by reducing cycle time, accelerating information transaction and facilitating better financial and knowledge management [1], [2], [3]. To obtain the all benefits the IT project of the implementation of the ERP package has to be exactly and coherently prepared. The users of the system need to get detailed information about the whole project and about the additional work that has to be do it to finish the implementation successfully. Especially in the case of the rapidly developing of small and medium enterprises, the charge of the human resources is very high, and each work not affected with the standard business processes is treated as a disturbance. The IT projects can not be successfully performed without the fully engagement of the team of workers in the enterprise. The rapid developing of an enterprise cause with the building of ad-hoc business processes (sometimes very effective) which can not be simply implemented in the structure of the ERP system. It means that either the ERP system must be expanded (additional costs of programming work) or the business workflows must be changed (disturbance by the flow of the business processes) [4], [5].

In this paper the some detailed problems and solution are discussed that have been appeared during implementation of ERP systems. The example are prepared on the base of practical experiences of the authors from area of furniture industry and machine construction.

2. THE PROBLEM OF SIGNIFICATION OF INDEXES

2.1 Classifier of materials and components

One of the standard problem that appear by implementation of ERP system is signification of indexes of materials, details, components and products. Especially for the firms that realised single volume, engineer to order production where the number of material indexes can score more then 10 000, the logical structure of the indexes is very important. The process of signification of indexes must be do it by the employers responsible for procurement of the enterprises and not by the consultants that implement the ERP system. Very important is that if the structure of indexes is wrongly established on the beginning of implementation of ERP system it is not possible to change it later. The constructor has to compose the bill of material for each product precisely and fast. That means he need a possibility to find correctly material at once. To assure the logical structure of material indexes the firm has to create classifier of indexes, Fig. 1.

Operacje		Pocz. ind.	Opis pozycji
[-] Wszystkie indeksy			
[-] I - Inne			
[-] K - Wykazy "K"			
[-] N - NKP			
[-] P - Podzespoły			
[-] U - Usługi i kooperacja			
[-] W - Wyroby gotowe			
[-] Z - Materiały zakupowe			
[-] 11 Ropa naftowa i gaz ziemny		Z11	11 Ropa naftowa i gaz ziemny
[-] 14 Produkty kopalne (w tym żwir i piasek)		Z14	14 Produkty kopalne (w tym żwir i piasek)
[-] 17 Wyroby włókiennicze		Z17	17 Wyroby włókiennicze
[-] 20 Drewno, płyty, sklejk, wyj. stolarskie, opakowania drewniane		Z20	20 Drewno, płyty, sklejk, wyj. stolarskie, opakowania drewniane
[-] 22 Druki i zapisane nośniki informacji, usługi poligraficzne		Z22	22 Druki i zapisane nośniki informacji, usługi poligraficzne
[-] 23 Produkty rafinacji ropy naftowej, oleje i smary		Z23	23 Produkty rafinacji ropy naftowej, oleje i smary
[-] 24 Produkty chemiczne		Z24	24 Produkty chemiczne
[-] 25 Wyroby z gumy i tworzyw sztucznych		Z25	25 Wyroby z gumy i tworzyw sztucznych
[-] 26 Wyroby z pozostałych surowców niemetalicznych		Z26	26 Wyroby z pozostałych surowców niemetalicznych
[-] 27 Metale		Z27	27 Metale
[-] 28 Wyroby metalowe gotowe oprócz maszyn i urządzeń		Z28	28 Wyroby metalowe gotowe oprócz maszyn i urządzeń
[-] 29 Maszyny i urządzenia gdzie indziej nie sklasyfikowane		Z29	29 Maszyny i urządzenia gdzie indziej nie sklasyfikowane
[-] 30 Maszyny biurowe i komputery		Z30	30 Maszyny biurowe i komputery
[-] 31 Maszyny i aparatura elektryczna, przewody, sprzęt oświetleniowy		Z31	31 Maszyny i aparatura elektryczna, przewody, sprzęt oświetleniowy
[-] 32 Elementy elektroniczne, aparaty i elem. telef., telegraf. i		Z32	32 Elementy elektroniczne, aparaty i elem. telef., telegraf. i
[-] 33 Aparatura pomiarowa, projektowanie, sprzęt optyczny		Z33	33 Aparatura pomiarowa, projektowanie, sprzęt optyczny
[-] 35 Sprzęt transportowy pozostały		Z35	35 Sprzęt transportowy pozostały
[-] 45 Specjalistyczne roboty budowlane		Z45	45 Specjalistyczne roboty budowlane
[-] 60 Usługi transportu lądowego		Z60	60 Usługi transportu lądowego
[-] 61 Usługi transportu morskiego i przybrzeżnego		Z61	61 Usługi transportu morskiego i przybrzeżnego
[-] 62 Usługi transportu lotniczego		Z62	62 Usługi transportu lotniczego

Fig. 1 An example of classifier of indexes

The structure of material indexes shown on the Fig. 1 is associated with PKWU code (polish system of material signification for statistical goals). The indexes are established by the constructors as phantoms and verified by the procurement. The logical structure of the classifier of indexes enable:

- avoid to establish the redundant material indexes in the system,
- generate the whole statistical reports about utilization of materials divided on the PKWU groups,
- facilitate the finding of required materials by the building of bill of material,
- sample calculation of quantity of similar materials in the construction.

The same problem regards the signification of indexes of components (semi-finished products). In the case of serial manufacturing where number of variants of products is limited, the building of the classifier of indexes of semi-finished products is reasonable. But if the components for each construction are quite different that is not possible to create effective classifier structure for the semi-finished products. To solve the problem of indexes of semi-finished products that is advisable to associate it with the number of design. Such solution give us a possibility to associate the management of the bill of materials together with the documentation management. Of course if a constructor make an error in the documentation and the drawing must be changed by a revision the index of the semi-finished product must be copied on the index with revision and the revised index must be exchanged in the all bills of material. This system of the signification of indexes of components enable to analyse the history of all errors that have appeared during the construction and production processes.

2.3 A centralised system of indexes

Lets consider the case of furniture enterprise that realised make to order production. The firm is a medium enterprise (one from many) that belongs to the big concern and deal only with manufacturing and design of furniture. For sale and marketing are responsible the associates firms of the concern but each manufacturer has direct clients too. The structure of the finished products is complex and encompass about 50 models but each model can perform in hundreds of variants (colour of textures, stalks, functions, etc.). The customer get catalogues of the optional elements for each model and can choose any variant of a product. The sales office has to configure the structure of the order (select available option of the product) on the base of the bill of materials and send it to a selected manufacturer. The manufacturer can alone realised the order or (if the resources are overloaded) can subcontract it to another one. That means that customer, the sales office and the all manufacturers have to use the same indexes for each material used in any bill of material. To unify the structure of indexes in the whole concern the central data base of indexes is established. Each manufacturer that during building the bill of material uses a new material or semi finished product have to call the central database and agree the new index. Each manufacturer implement individual the same ERP system what enable to exchange the production orders each others. To coordinate and improve the system of data exchange the private satellite computer network is built among the whole firms of the concern, Fig. 2. The prepared structure of workflows is very flexible and in the future can be a base for business-to-customer concept of the performance of the company.

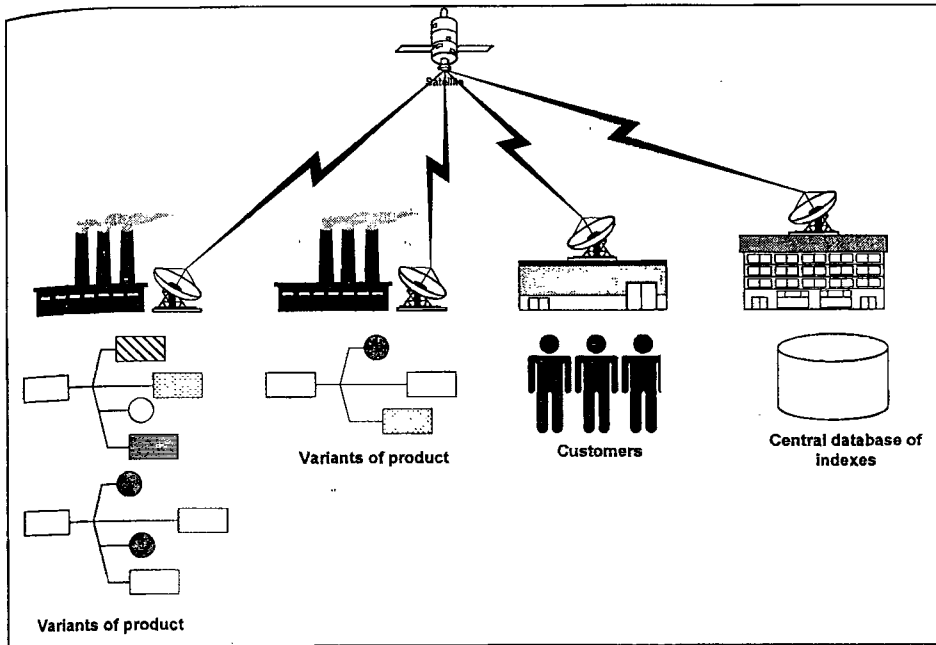


Fig. 2 The company with the central database of indexes

3. THE PROBLEM OF OUTSOURCING

To be flexible the manufacturing enterprises have to be able very fast undertake the decisions if any component (or the whole product) be made inner or outside of the firm. The decisions result from the operational planning system that give a information about the rate of resource utilization. It is no problem if the decision is undertaking on the by the constructors and technologists. In the bill of material the components designed for outsourcing can be marked. Sometimes the decisions that the component, product or production order must be manufactured by cooperation firm is undertaken by the technological and production planning departments of the firm when the construction of the product is finished and the bill of material is ready. So, the following cases have to taken into account:

- a product or semi-finished product is made by cooperation firm (the product is bought from the cooperation firm),
- a product or semi-finished product is made by cooperation firm but the materials and components for manufacturing of the product are partly or totally bought by principal enterprise.

To propose a solution for each case the following assumption must be hold:

- if today any product or component is manufactured by the cooperation firms it not means that next time the product will be produced totally by principal enterprise
- the cooperation firms need the documentation and bill of material to manufacture each product.

The described situation is shown in the Fig. 3.

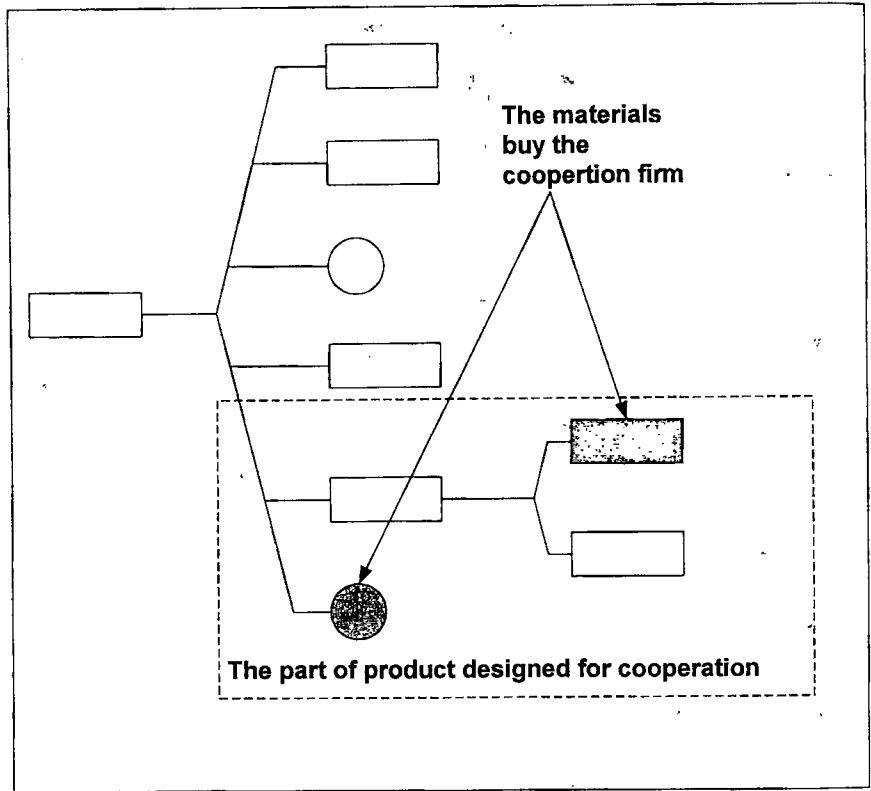


Fig. 3 The BOM of the product partially manufactured in cooperation

The practical solution of the problem require building the bill of material of the product designed for the cooperation (each ERP system enable copy the index of any semi-finished product to the new one). In the new bill of material the norms of all materials buying by the cooperation must be reducing to null. The original bill of materials must be held in the system because next time this component can be manufacture in the principal firm or another materials must be bought by cooperation.

4. CONCLUSIONS

In the paper three example problems that appeared during implementation of ERP system in an enterprise are shown. The detailed problems show that the process of implementation of the ERP system is always specific for the enterprise. The employers that known all workflows in the firms have to be, strongly engaged in the implementation because they can very good define the requirements and critical business processes of the enterprise. Of course the described examples touch only superficially the problems of implementation of ERP systems. Other side it is very important to collect the all such problems classified for different types of enterprises.

That can enable define the most important functions of the ERP system that can be implemented by specific enterprise.

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