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# A DATA ANALYSIS BASED METHODOLOGY OF ERP SYSTEM EVALUATION

**Abstract:**

*Enterprise Resource Planning (ERP) are nowadays a software packages that can support all business activities of enterprises [1], [8], [10], [11]. The production enterprises often implement an ERP systems to improve important functions in such functional areas as sales, product design and technology, material management, purchasing or production planning. Absolute majority of them implement ERP in administration areas such as human resource, controlling, financial accounting or capital assets. The implementation of ERP is expensive and time-consuming process that often can fall flat. The enterprises that successfully implemented ERP don't want to change the system long time to unique disturbances. But employers of the enterprise realize only the transactions in ERP that are necessary for property workflows and managers analysis. The lack of important data in the ERP system can result with impossibility of strategic analyses performance [12], [14], [16]. In the situation ERP can not support strategic decisions of managers too. In the paper an ERP evaluation method based on data analysis is proposed. The authors of the article claim that value of ERP system is consist of two important components: possibility for improving of critical business processes and possibility for critical decision support. The model of ERP evaluation system for project driven enterprise is proposed. The illustrative examples are given.*

## 1. INTRODUCTION

The process of selection and implementation of ERP system is a strategic decision for each enterprise [2],[3]. It demands total engagement of the enterprise resources (especially top management) is expensive and time-consuming. From the beginning the ERP systems were rather dedicated for repetitive production branches such as motor or furniture industry then for single production such engineering industry. In repetitive production only a few of new products are designed in a year. The ERP support more production planning, material management and controlling activities then new product design. In a single production that is realized by a project driven enterprises each order require creation of a new product design and a new technology. In the case the functions of ERP system should more support offer evaluation and monitoring of cost in progress then production planning or price discount management. The data quantity that has to be introduced to the ERP system is depending from production structure of the enterprise (see. the Fig. 1).

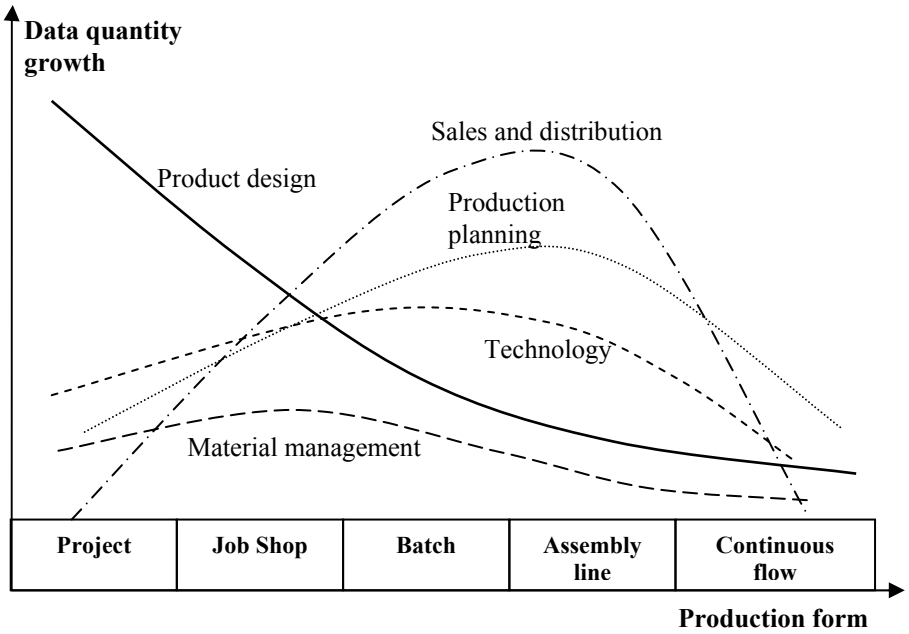


Fig. 1. Dependences between the data quantity in ERP and the production form

The project driven enterprise that constructs for example CNC machine tools has to build great database of material indexes. The database of materials encompasses often thousands of material indexes from sheet steals to electric motors. A bill of material created for each new product requires hundreds new components. A lot of the components are unique and require new materials (especially prototypes) and it means rapid growing of material indexes quantity in ERP. For each new product hundreds of sub-assembly products have to be constructed. The example of increasing of sub-assembly and material indexes in a project driven enterprise is presented on the Fig. 2. The bill of material for each new machine tool can be very complex and unique. In the project driven enterprises the great number of records of ERP database is generated by constructors who build the bill of material, create new material indexes, sub-assembly products, and ready products. The work can be automated if the CAD system can generate the BOM for ERP system (Product Data Management systems). If the BOM is ready then the construction of machine tools is verified by technology department. Sometimes the design and technology of the product are performed concurrently. The technology is mostly prepared for several simultaneously realized projects. In the case for example the cutting of material is more economic (material waste reduction). The technology departments take mostly the make or buy decision too. For example if the shell of a machine tool will be manufactured inner the company the bill of material will be not changed but if it will be outsourced then it has to be transformed to one index– machine shell.

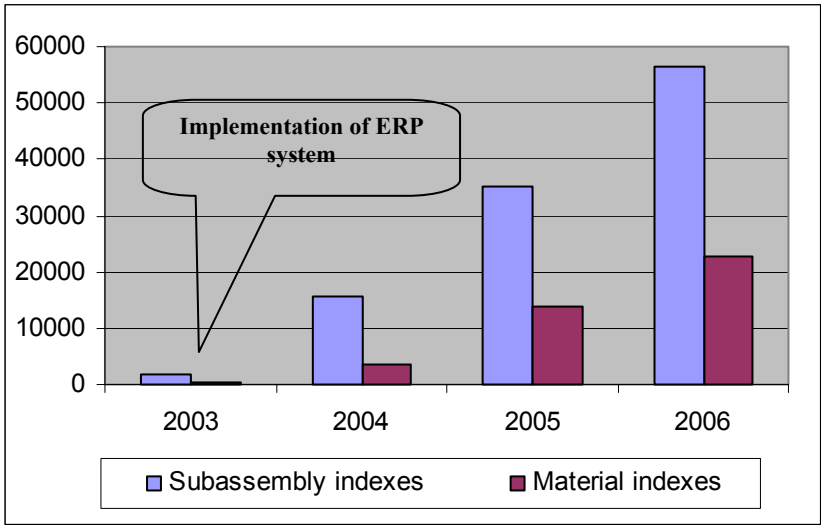


Fig. 2. An example of indexes number increasing in ERP database of a project driven enterprise

The bill of material of a product in ERP includes critical data used in many of functional areas of the project driven enterprise and the statistical analyze of the data deliver fundamental information about the business processes of new product construction. Of course there are a great number of data that are entered into the ERP database and to evaluate the ERP system the critical data should be identified for each functional area of the enterprise. ERP systems enable to register a great number of data but only few of them are useful for enterprise. By implementation of ERP a compromise between data quantity and labor input has to be found. For example if a size and weight of ready product will be not recorded the process of product shipping and track filling can not be supported by ERP. But the data acquisition is time consuming and requires measurement of each product. The important question is if the workload is profitable. Another typical example is operation time measurement. To support production planning the operation times are required. But each operation can be segmented on a lot of sub-operations. The important decision is how exactly the technology should be represented in ERP. If the representation of technology is over-detailed the workload of the data acquisition can be extreme high. The presented examples illustrate the problem of enterprise modeling for ERP system implementation - how many and how exactly data should be entered into the ERP. The set of selected data can be used for former ERP system evaluation on the base of statistical methods. The main problem considered in the article is formulated as follows:

*Given is a project driven enterprise with defined structure of business processes and critical decision. How effectively selectand implement an ERP system for the company?*

In the next chapter the functional areas, critical business processes for each area and fundamental data for each the business process for project driven enterprise will be defined. On the base of the functional area, business processes and important data the model of ERP system will be determined. The third chapter includes the methodology of ERP system evaluation

dedicated for the project driven enterprise. In the last chapter an example of ERP system evaluation based on proposed methodology is presented.

## 2. A BUSINESS PROCES ANALYZE AND EVALUATION FOR ERP IMPLEMENTATION

Why enterprises implement ERP system? There are many reasons such as improving of business processes, stock reduction, one database, transactions security, obsolete technology, Software ability to integrate all functions in a single system, time saving, visibility improvement and corporate strategy support, etc. [1]. But the main motivation of ERP system implementation should be improving of competitiveness of the company by support of operation, tactic and strategic decisions. The concept of ERP system modeling is presented on the Fig. 3.

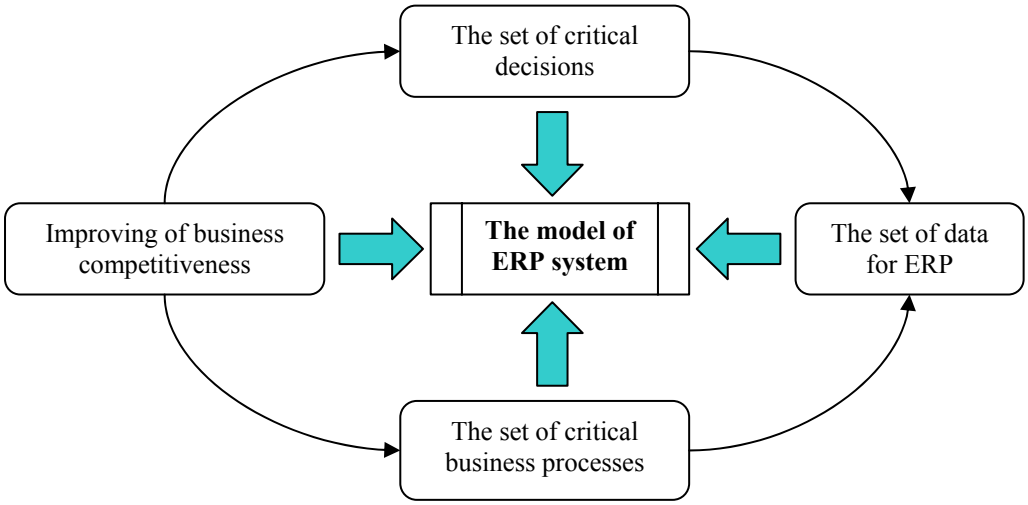


Fig. 3. The concept of ERP system modeling

Before the selection and implementation of ERP system each company should prepare itself for the complicated, expensive and time consuming process. First the scope of ERP implementation should be determined. The scope is determined by the functional areas, the structure business processes and business resources which are described by the data. In each functional area a set of critical decisions have to be undertaken and the efficient decisions require solid data. The strategic decisions require long term historical data encompass several business periods. It means that the ERP system implemented in 2007 could support the strategic decisions maybe in year 2010. The tactic of the company could be supported in two years and the operation decisions just after implementation. The Fig. 4 presents the typical functional areas of a project driven enterprise that should be supported by the ERP.

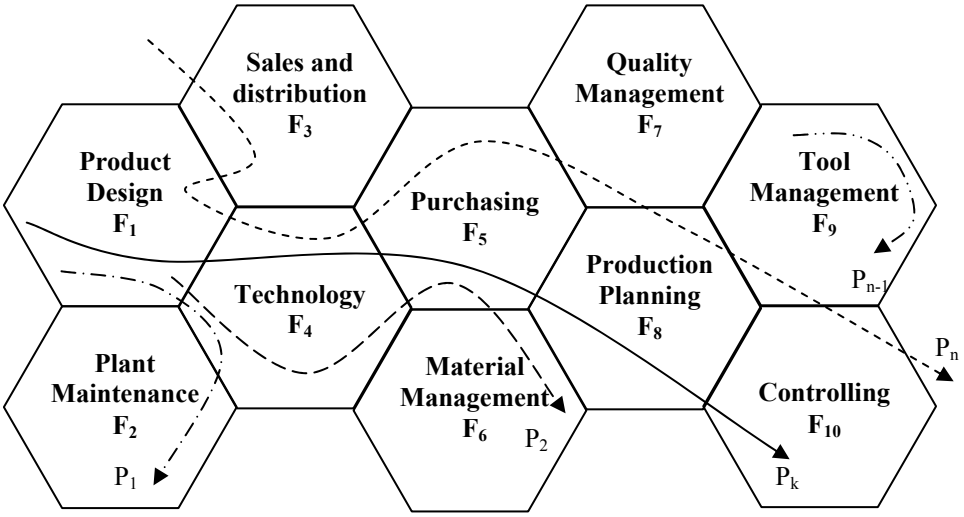


Fig. 4. The functional areas an business processes of project driven enterprise

For each functional area a set of resources should be defined. For example each constructor belongs to resources of Product Design ($F_1$) area and a machine tool belongs to resources of Production Planning ($F_8$). To describe the resources in an ERP system a required data are necessary. For example to describe a machine tool the following data are necessary: symbol, availability, set of operations, cost, amortization, maintenance periods, and so on. The set of data required by ERP system is limited by a set of decisions which should be supported. Each decision is concerned with a business process (or processes) realized in the company. For example to decide which material should be used in a bill of material, a constructor needs the following data:

- cost of material,
- material supplier,
- delivery date,
- available technology.

The business process concerned with the decision is – mechanical construction of CNC. The process uses the following resources: a constructor, CAD system and software for BOM building. The model of ERP system is based on structure of functional areas, resources, business processes, data and decisions. The more operational, tactic and strategic decisions will be supported by the ERP the implementation of ERP is more successfully. But increasing quantity of supported decisions requires more and more data what results with increasing of labor intensity and implementation cost. In the Table 1 examples of processes realized in product design functional area of project driven enterprise are presented.

Table 1

| Functional area | Business process | Decision variables | Data |
|---|---|---|---|
| **Product design $F_1$** | Construction design – $P_1$ | material, bill of material, optional construction, quality requirements | material, semi-finished product, service, product, component quantity, drawing, purchase price, time-rates, costs ratios, units of measure |
| | Documentation outline – $P_2$ | bill of material, CAD system, technology description | |
| | Construction changes – $P_3$ | bill of material, technology, kind of changes, | |
| | Bill of material preparation – $P_4$ | number of indexes, component quantity, | |
| | New index creation – $P_5$ | index labeling, kind of index, | |
| | Calculation of self cost – $P_6$ | material cost, labor cost, indirect cost factors, | |

The described business processes are related each other. During performance of the processes constructors make decisions that influence on the final result. The example of the performance of the business processes and decisions are presented on the Fig. 5. For the processes and decisions visualization the Unified Modeling Language is used. If the constructor is obligated to permanent monitoring of the self costs of designed product he has to recalculate each finished component and if the cost are to high he should looking for a cheaper material or more economical solution. All the business processes appointed in the Table 1 are included in the structure displayed on the Fig. 5. The business processes $P_k$ can be characterized by the following parameters:

- $T_k$ – average execution time,
- $F_k$ - average number of repetition in a time period (200 in a month),
- $R_k$ - set of resources used by the business processes $P_k$,
- $D_k$ - set of data,
- $E_k$ - set of decisions.

Each resource $r_p$ where $r_p \in R$ is described by the following parameters:

- $N_p$ – resources quantity,
- $C_p$ - operating cost of the resource in a time unit (for example 50 EUR in hour).
- $V_p$ – average value add of the resource in a time unit (for example 120 EUR in hour)

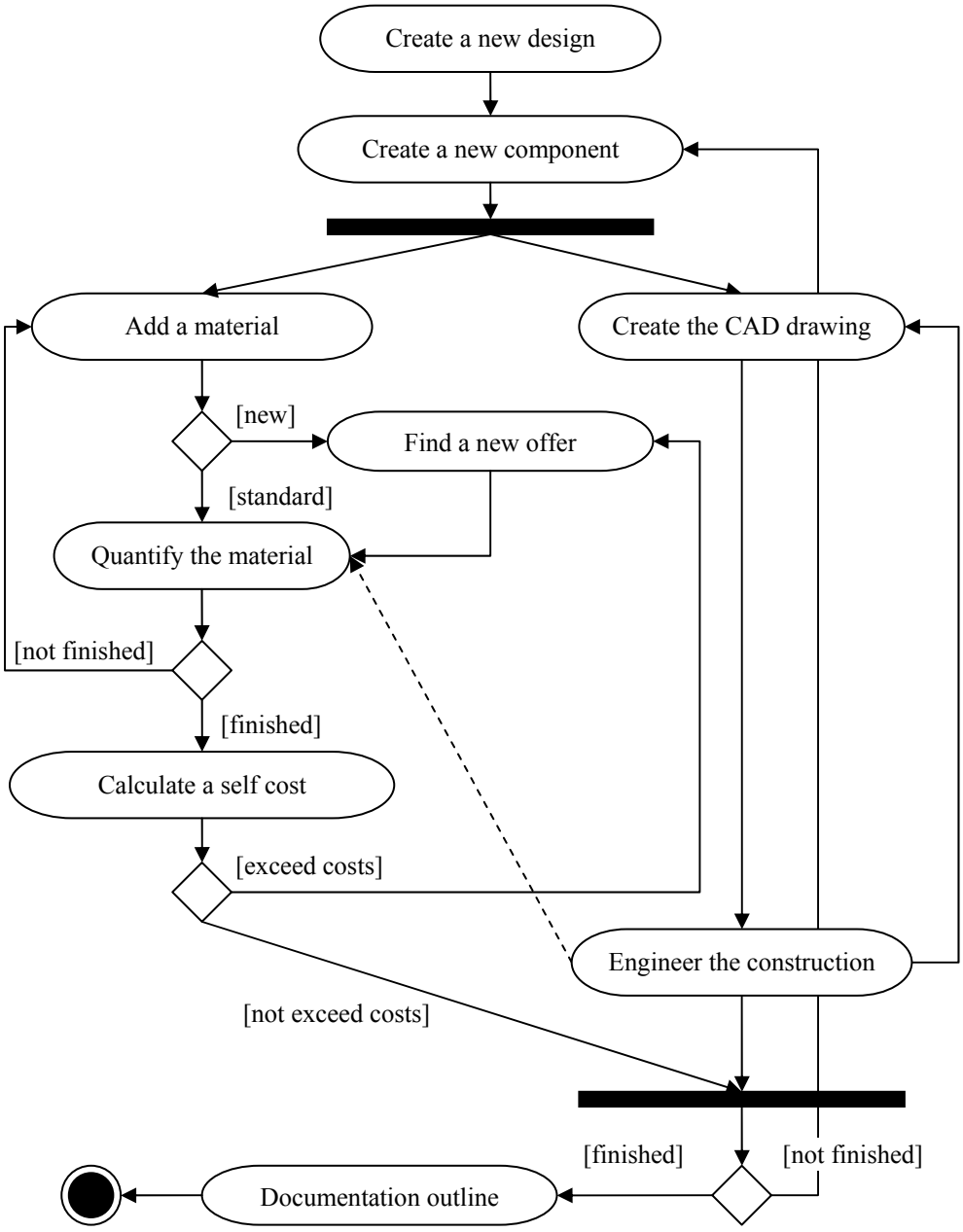


Fig. 5. Visualization of business processes

The performance of the business processes presented on the Fig. 5 requires the following resources:

Constructor + CAD system + Worksheet (for bill of material)

Because each constructor need CAD system and calculation worksheet the three resources can be treated generally as one resource – Constructor. To evaluate the business processes the following question has to be asked:

1. What are the volume indexes that describe efficiency of the business processes?
2. What are the quality indexes that describe efficiency of the business processes?
3. How important are the processes for the whole company?

To answer the questions the resource analyzes should be performed. The Fig. 6 presented average daily resource utilization and number of resources in six months by a project driven enterprise based on real data registered in ERP system. The interpretation of presented indexes is following:

**Average value of registration = 5** means that the average time of the single business process registered by a resource is 5 hours.

**Number of resources** – for example in May the business process is realized by 13 and in June by 16 resources.

**Standard deviation** counted for the all values of registrations in month.

**Repetition pro resource** – determines the average number of execution of the business process by a resource.

**Repetition number in month** – means the total number of execution of the business process by the resources in month.

**Total hours in month = 1500** means that total time of the all realizations of the business process in month is 1500 hours.

**Utilization index** is calculated as the quantity of total hours divided by number of resources.

The business process realization can mean any activity presented on the Fig. 5 (oval shapes) because the registration of the business process in ERP system is simplified to the one business process – product design. The process encompasses all activities performed in product design functional area. To calculate the average cost of the resource utilization the operating cost of the resource in a time unit is required. In the considered company the cost and price of resource utilization are accordingly $C_p$=45 EUR is $V_p$=105 EUR.

Table 2

| | May | June | July | August | September | October | November |
|---|---|---|---|---|---|---|---|
| $N_p$ | 13 | 16 | 18 | 17 | 20 | 17 | 21 |
| $Max(N_p) \times H$ | 3 696 | 3 696 | 3 696 | 3 696 | 3 696 | 3 696 | 3 696 |
| $C_M=Max(N_p) \times H \times C_p$ | 166 320 | 166 320 | 166 320 | 166 320 | 166 320 | 166 320 | 166 320 |
| $H_M = T_k \times F_k$ | 1 376 | 1 473 | 1 618 | 1 817 | 1893 | 2 071 | 1 849 |
| $V_M = T_k \times F_k \times V_p$ | 144 428 | 154 665 | 169 890 | 190 733 | 198 765 | 217 455 | 194 154 |
| $V_M - C_M$ | -21 893 | -11 655 | 3 570 | 24 413 | 32 445 | 51 135 | 27 834 |

The value $V_p$ is the calculation price which the customer should pay for each hour of the product design. In a month average number of hours for each constructor is equal to H =176 (8 hours in 22 days). Table 2 present the total costs, value ad and profits calculated on the base of registered business processes.

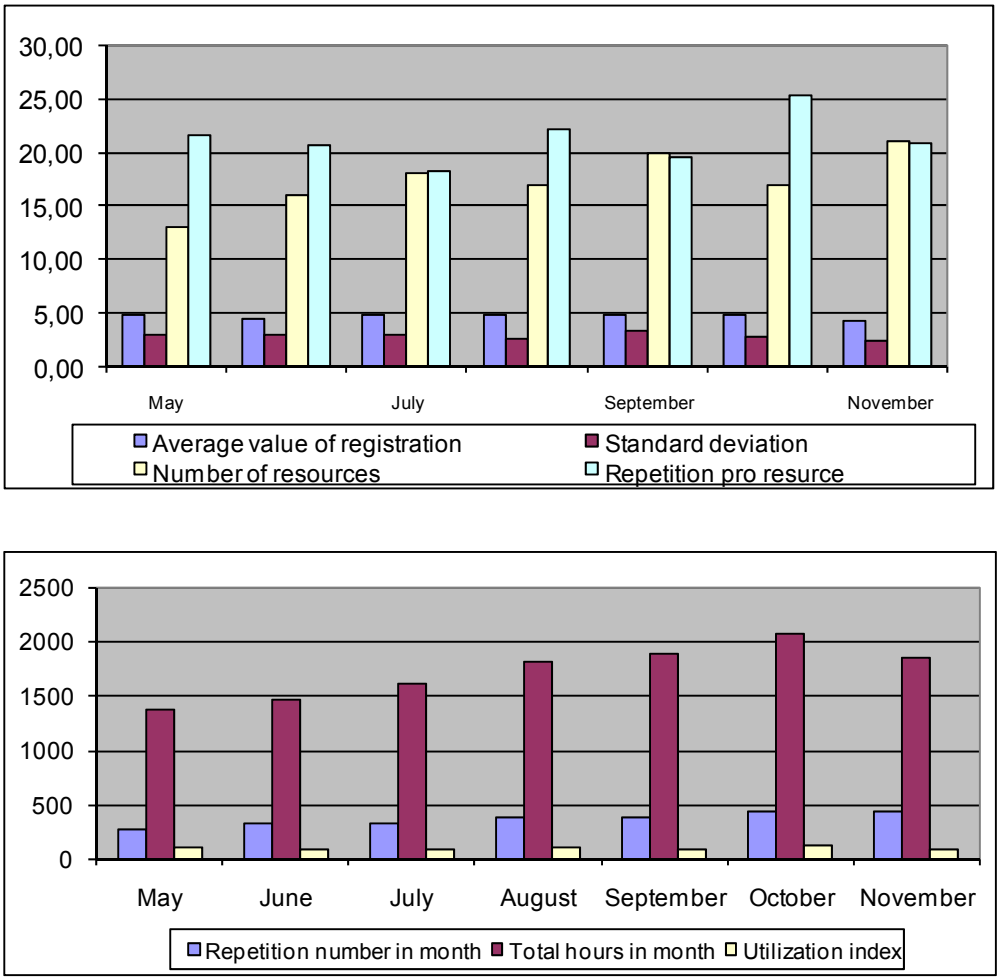


Fig. 6. The data analyze of business processes realized in product design functional area

The monthly cost of the resources is referenced to the maximum number of resources (all constructors employed in the project driven enterprise). From the analyze of charts from Fig. 5 and the Table 2 results that the biggest profit from the business process the company reached in October because the number of resources was relatively low $N_p$=17 but the number of registered hours was high Tk × Fk = 2071. The big number of hours performed by the resources and high resource utilization index results with the high profit. For the considered example the critical number of hours $H_C$ then the monthly profit is equal to null can be calculated as follows:

$$H_C = Max(N_p) \times H \times C_p / V_p = 166320 / 105 = 1584 \text{ h}$$

From analyze of business process performed in product design results the set of data and critical decision that should be made in the area of product design. The following data will be required for the business process performance in functional area of product design:

- material (index, name, kind, purchase price, delivery time, size, units of measurement, etc.),
- semi-finished product (index, name, kind, bill of material, technology, cost, etc.),
- service (index, name, kind, supplier, cost, etc.)
- product (index, name, kind, bill of material, technology, cost, etc.),
- index of drawing (index, name, date of creation, data of changing etc.),
- time-rates,
- costs of resource utilization,
- number of resources,
- cost of resources,
- business process execution time (registration of the business process execution).

One side, to evaluate the costs and time of ERP system implementation the quantity of data should be determined and then the time of the data acquisition should be estimated. Another side the adaptation of business process presented on the Fig. 7 for ERP should reduce the time and cost. The Fig. 7 presents the business process of product design adapted for ERP system. The adaptation consists in integration of ERP and CAD on the base of PDM (Product Data Management) system. Some of sub processes are automated. On the base of CAD drawing the Bill of Material can be automatically generated. In ERP system the calculation of self cost can be directly performed. The material prices (for new and old materials) are introduced in purchasing module of ERP system. The integration of ERP and CAD system require data synchronization (material libraries of CAD and material indexes of ERP systems). The quantity of material in components can be counted directly in CAD on the base of geometrical data and exported into the ERP. The innovations can reduce the average time of the business processes from 30-50%. If the time of the business process be reduced only to 30% the monthly cost will be changed. The simulated cost of business processes after adaptation for ERP is presented in the Table 3.

Table 3

| | May | June | July | August | September | October | November |
|---|---|---|---|---|---|---|---|
| $H_M = T_k \times F_k$ | 1 376 | 1 473 | 1 618 | 1 817 | 1 893 | 2 071 | 1 849 |
| $H'_M = 0{,}3 \times H_M$ | 413 | 442 | 485 | 545 | 568 | 621 | 555 |
| $V'_M - C_M$ | 21 451 | 34 745 | 54 537 | 81 649 | 92 075 | 116 372 | 86 078 |

The calculation is valid only if the all time profit is used for realization of additional orders. If the resources are uncharged the calculation can not be used but the main assumption of ERP system implementation is improving of business processes by the time reduction. The time profit can be directly expressed in money units and the whole investment can be balanced.

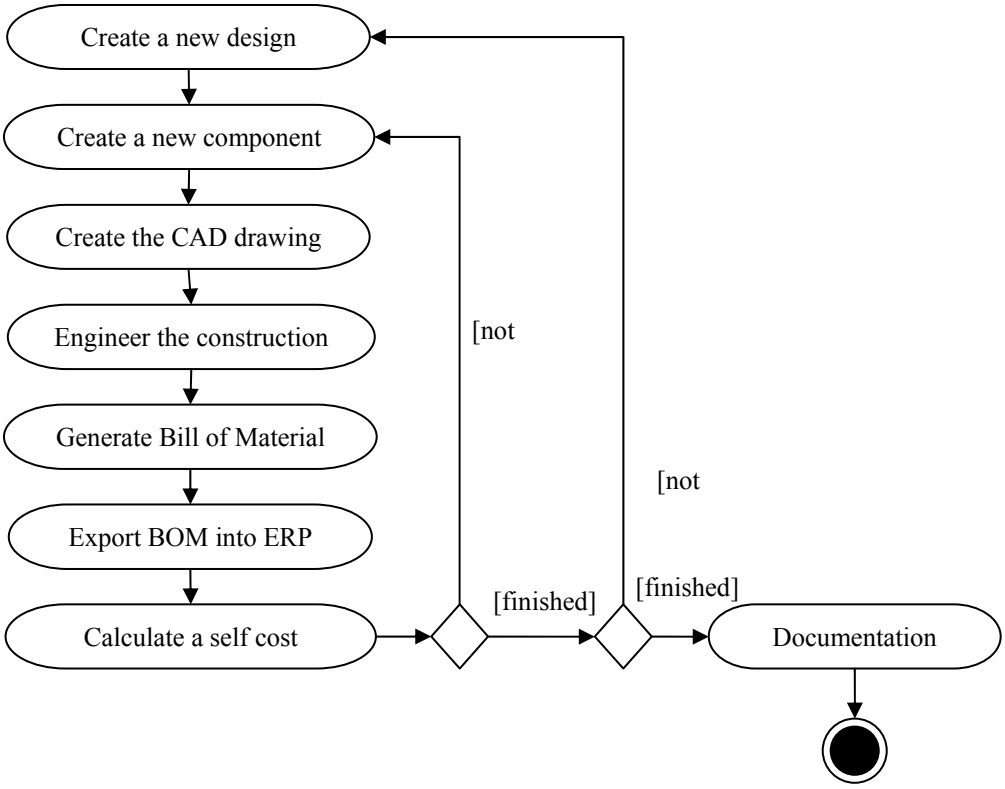


Fig. 7. The business process of product design after adaptation for ERP system

From the adaptation of the business process to ERP system directly result profit D that is calculated for the period of six month as:

$$D = \sum(V'_M - C_M) - \sum(V_M - C_M) = 381\ 058 \text{ EUR}$$

If cost of innovation in area of product design cost 500 000 EUR it means that return of invested capital period for implementation of ERP in the functional area is about one year. The simple example describes the procedure of evaluation of business process adopted for implementation in ERP system.

The methodology of business process evaluation oriented on ERP system adaptation is presented on the Fig. 8. The first step of the methodology is mapping of business processes and selection of evaluation measurements such as time, cost, or quality. The mapping process requires determination of resources, data and decisions that participate in the business process. The structure of business processes, evaluation rate and the resources enable to calculate unit costs of business process (for example cost of 1 hour of a business process). In next step the change of business process should be performed to adapt it for an ERP system. Important is that the adaptation can be performed generally and not has to be referred for specific ERP system.

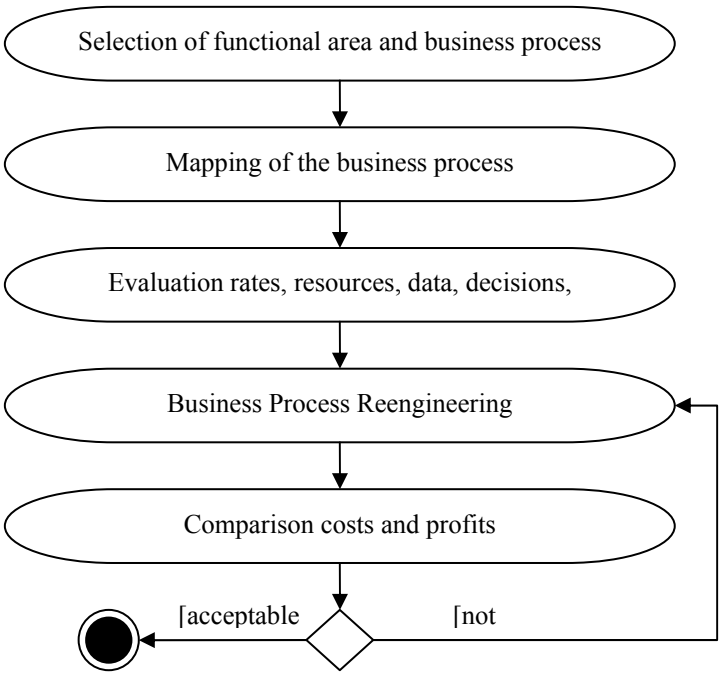


Fig. 8. Methodology of business process adaptation and evaluation

The evaluation of decisions associated with particular business processes can be performed on the base of quality indexes. To realize this goal the evaluation matrix should be created that encompasses functional areas, business processes and decisions. For each set of decision $\mathbf{E_k}$ a set of weight $\mathbf{w}_k$ should be assigned to evaluated importance of the decisions. The model of the matrix of critical decisions is presented in the Table 4.

Table 4

| | $P_1$ | | $P_2$ | | ... | | $P_n$ | |
|---|---|---|---|---|---|---|---|---|
| $F_1$ | $E_{11}$ | $w_{11}$ | $E_{12}$ | $w_{12}$ | ... | ... | $E_{1n}$ | $w_{1n}$ |
| $F_2$ | $E_{21}$ | $w_{21}$ | $E_{21}$ | $w_{21}$ | ... | ... | $E_{2n}$ | $w_{2n}$ |
| ... | ... | ... | ... | ... | ... | ... | ... | ... |
| $F_m$ | $E_{m1}$ | $w_{m1}$ | $E_{m1}$ | $w_{m1}$ | ... | ... | $E_{mn}$ | $w_{mn}$ |

The weights are between 0 (unimportant decision) and 5 (very important decision). For example the business process of product design requires making the following decisions:

- $E^1_{11}$ - if the self cost of the project is to high then find cheaper materials - $e^1_{11} = 4$
- $E^2_{11}$ - if used materials are inaccessible then find substitutive materials - $e^2_{11} = 3$

- $E^3_{11}$ - if there are no resources to prepare product design then change project deadline - $e^2_{11} = 5$
- ...

The evaluation enable to determine which decisions should be supported by the ERP system and that results with a set of data that should be acquired and how expensive is the data acquisition. The analysis can be especially useful to specify the assumptions and limitations for selection and methodology of implementation of ERP systems. In the next chapter the procedure of selection of ERP based on critical decision analysis is presented.

## 3. THE METODOLOGY OF ERP SYSTEM SELECTION EVALUATION

The detailed analyze of the business processes in project driven enterprise (business processes mapping, description and visualization) enable to create the matrix of critical decisions. For properly implementation of ERP the decisions should be sorted according to weight and business requirements. The list of decisions decides directly about a sequence and scope of implementation of ERP and indirectly about cost of data acquisition. The process of verification of critical decisions that should be supported by ERP requires a checklist of possibilities of different ERP systems. The list could be prepared on the base of general benchmarking information prepared each year by Gardner Group, IDC, etc. which compare functions and possibilities of different ERP systems. It means that the ERP the matrix of critical decisions determines the set of ERP systems which should be taken into consideration. The sequence of implementation of ERP system in project driven enterprise is restricted by functional areas, data acquisition and staff competence. The typical sequence of ERP selection and implementation process in project driven enterprise is shown on the Fig. 9. As the result of procedure of business processes adaptation and evaluation is set of data. The data should be introduced into ERP in defined order. For example to build a bill of material of any product the row materials and semi finished products should be introduced. For the particular data categories the responsible functional areas should be assigned. For example

- raw materials - $F_1$ Product design
- semi finished products, - $F_1$ Product design
- finished products, - $F_1$ Product design
- packaging, - $F_1$ Product design
- services, - $F_4$ Technology
- material prices, - $F_5$ Purchasing
- machine tools, - $F_4$ Technology
- technologies, - $F_4$ Technology
- tools, - $F_4$ Technology
- departments, - $F_{10}$ Controlling
- prices and discounts, - $F_3$ Sales and distribution
- contractors (suppliers and customers), - $F_{10}$ Controlling
- capital assets, - $F_{10}$ Controlling
- etc.

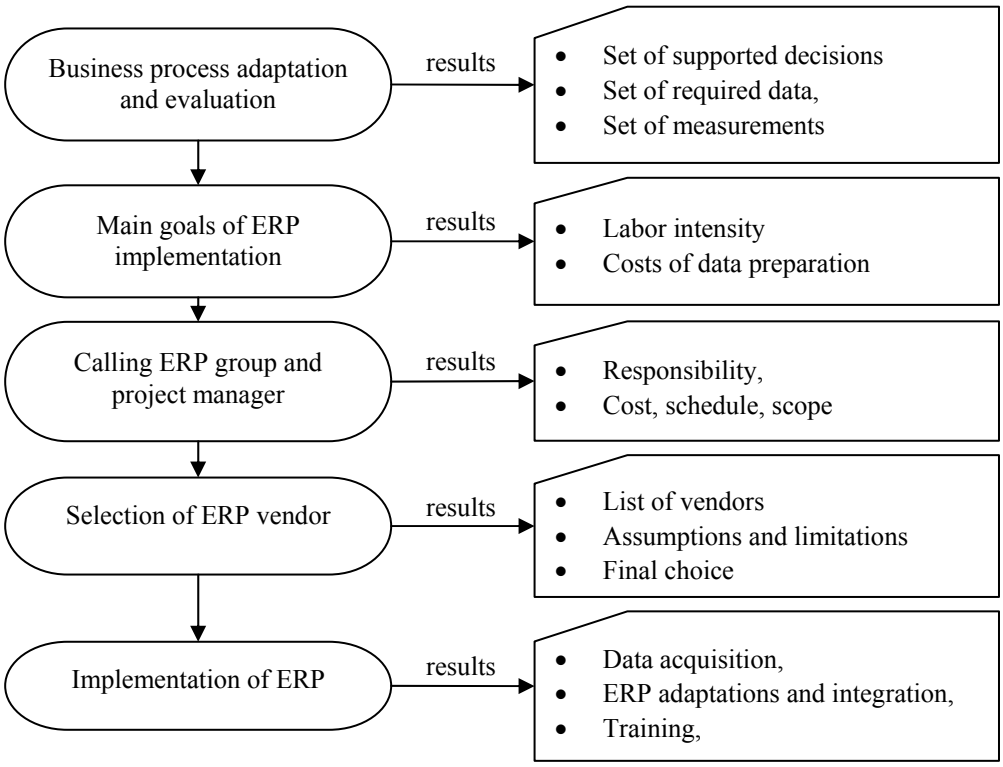


Fig. 9. The methodology of ERP system selection and implementation for project driven enterprise

If the number of indexes is great (thousands of indexes), the indexes classification can be helpful because enable to arrange the indexes according to various features. If the semi finished products and the ready products could include exchangeable materials then the product configuration should be taken into consideration.

Before ERP system implementation the is-analysis of possesses data should be done. If for example the operation times are not determined (timing is not performed) and the ERP should support planning processes then the labor intensity of the timing should be performed. The data can be prepared in form of data-sheets to enable import of them into selected ERP system. If the data are ready then the ERP team should be created and a project manager should be assigned. The ERP group and project manager should be intensively engaged in business process adaptation and evaluation to coordinate the activity between different functional areas. The ERP group should prepare the project of implementation and general assumptions and limitations concerned with implementation time, scope and budget. They should prepare the implementation strategy and sequence of functional area where the ERP will be implemented. Next step is concerned with selection of ERP vendor. First the long list of potential vendors should be prepared. On the base of offers and market investigation a short list of ERP vendors should be determined (3-4 vendors). The final selection of ERP supplier is a very important milestone for further ERP system evaluation. The

evaluation criteria are determined by business process adaptation and by the project preparation. The excess of budget or scope of the project affect negatively on the total evaluation of the ERP implementation project. The same situation is if some of decisions can not be supported by ERP. The weigh of the decisions are bigger the lover is the evaluation index. Because some decision to be supported requires several time periods (especially strategic decisions) so the schedule of ERP implementation should encompass not only terms of particular functions implementation but also terms of possibility of decisions support. The decisions are closely bounded with the business processes. The basic business processes and associated decisions results occur in the project driven enterprise are presented in the Table 5.

Table 5

| Symbol | Business process description | Associated decision results |
|---|---|---|
| $P_1$ | CRM | information for and from customers |
| $P_2$ | offer inquiry registration | offers priority appointment |
| $P_3$ | offer preparing and processing, | prices, discounts, deadlines, scope |
| $P_4$ | sales order registration, | order priority appointment, |
| $P_5$ | debt controlling, | stop order, prices, discounts, |
| $P_6$ | contract billing, | market strategy, cost reduction |
| $P_7$ | claim servicing, | repair term, spare parts warehouse |
| $P_8$ | product configuration, | number of variants, product diversification |
| $P_9$ | product price calculation, | target costing, competition analyze |
| $P_{10}$ | project scheduling, | deadlines, milestones, time management |
| $P_{11}$ | construction design, | material choice, material quantify, |
| $P_{12}$ | construction changing, | reasons of construction changing, |
| $P_{13}$ | documentation outline, | form of documentation (electronic, paper) |
| $P_{14}$ | BOM preparation, | number of levels, material convertibility |
| $P_{15}$ | product cost calculation, | calculation method, calculation rates |
| $P_{16}$ | technology preparing, | technology variants, new equipment, |
| $P_{17}$ | make or buy decisions, | new production, new suppliers, |
| $P_{18}$ | production planning, | schedule, priorities, cost of resources |
| $P_{19}$ | capacity management, | cost of resources, new resources |
| $P_{20}$ | availability control, | material, resource tools availability |
| $P_{21}$ | delivery planning, | delivery terms, delivery quantity |
| $P_{22}$ | control of manufacturing | production routes, |
| $P_{23}$ | material turnover | kind of turnover, material reservation, |
| $P_{24}$ | product packing and shipment | kind of packing, packing cost, |
| $P_{25}$ | operation registering | cost of labor, registration method |
| $P_{26}$ | maintenance control, | replacement stock, maintenance schedule |
| $P_{27}$ | investment management, | choice of investment objects, amortization |
| $P_{28}$ | financial analysis, | financial indexes, prediction, |

If the business processes are defined, adapted for ERP and the evaluation measurements are determined the schedule of business processes implementation can be prepared. The business processes can not be implemented in ERP in arbitrary order because some of processes results from another. For example the process $P_{15}$ of product calculation can not be performed if the BOM and technology are not ready. Some dependence between the business processes in project driven enterprise are presented on the Fig. 10.

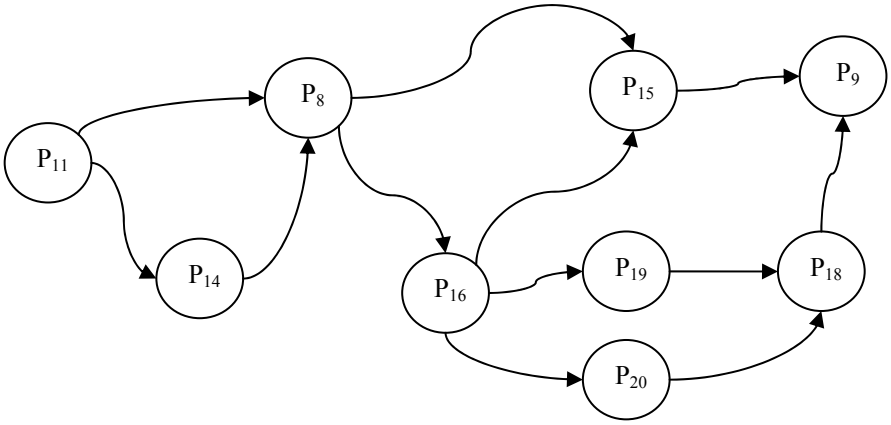


Fig. 10. The dependence between processes

The graph of dependences shown on the Fig 10 can be presented as a matrix of business processes dependences (see the Table 6).

Table 6

| | ... | $P_8$ | $P_9$ | $P_{10}$ | $P_{11}$ | $P_{12}$ | $P_{13}$ | $P_{14}$ | $P_{15}$ | $P_{16}$ | $P_{17}$ | $P_{18}$ | $P_{19}$ | $P_{20}$ | ... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ... | | | | | | | | | | | | | | | |
| $P_8$ | | | | | | | | | 2 | 4 | | | | | |
| $P_9$ | | | | | | | | | | | | | | | |
| $P_{10}$ | | | | | | | | | | | | | | | |
| $P_{11}$ | | 2 | | | | | | 3 | | | | | | | |
| $P_{12}$ | | | | | | | | | | | | | | | |
| $P_{13}$ | | | | | | | | | | | | | | | |
| $P_{14}$ | | | | | | | | | | | | | | | |
| $P_{15}$ | | | 5 | | | | | | | | | | | | |
| $P_{16}$ | | | | | | | | | | | | | 3 | 5 | |
| $P_{17}$ | | | | | | | | | | | | | | | |
| $P_{18}$ | | | 5 | | | | | | | | | | | | |
| $P_{19}$ | | | | | | | | | | | | 6 | | | |
| $P_{20}$ | | | | | | | | | | | | 6 | | | |
| ... | | | | | | | | | | | | | | | |

The values in the matrix describe the time of implementation of the business process in ERP system. On the base of the matrix of business processes dependence and the matrix of

critical decisions a schedule of decision support in ERP system can be prepared. And example of the schedule is presented on the Fig. 11.

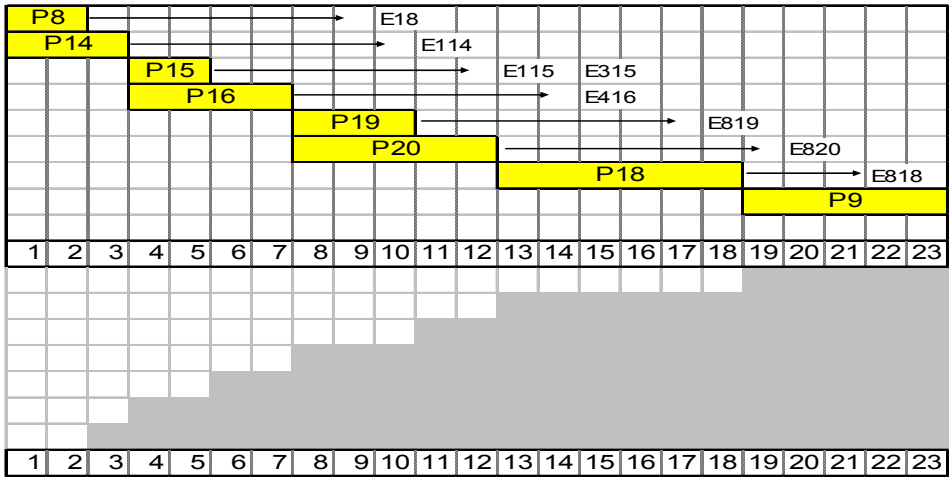


Fig. 11. The schedule of business processes and decision support

For example after implementation of business process $P_8$ (2 months) the support of decision E18 by ERP system will be possible. The implementation process of ERP system should be performed on the base of the generated schedule of business process. On each level of ERP system implementation, the decision supported by the ERP system can be evaluated and that means the implementation of the whole system can be evaluated. The sum of weights associated in to the decisions supported by ERP give the information about actual implementation state.

## 4. SUMMMARY

The article present a methodology of evaluation of ERP system implementation in project driven enterprise based on data analyze. The base of the methodology is determination a set of business processes and decisions that should be supported by ERP. The set of business processes define an area of data that should be introduced to the ERP. To use the methodology the structure of business processes in project driven enterprise should be well defined. The extracted business processes should be changed and adapted for ERP system implementation. As the general result of business process adaptation is a matrix of critical decisions that will be supported by ERP system. The goals of ERP implementation decide about the importance of particular decisions supported by ERP. The evaluation of ERP system implementation is based on a schedule where the implemented business processes and supported critical decisions are presented.

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