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Advisory system assisting selection of project structures and project team

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Industrial management and organisation

ABSTRACT

Purpose: The main aim of the paper is to investigate work effect of the advisory system, which helps the operator to make a decision concerning an adjustment of structure and structure project team to a certain project, which was selected by operator.
Design/methodology/approach: Exsys Professional program of Exsys Inc. was used to create the advisory system by rule processor.
Findings: System operator can a very quickly adjusted to structures (organizational and project teams) into to a project on the basis of the advisory system only by answering short questions from the system. Moreover, an advisory system shows graphic presentation of the results.
Research limitations/implications: The built advisory system can be a great basis to create a tool, which will assist in making more complicated decisions.
Practical implications: A disadvantage of Exsys Professional program are both, laborious and time-consuming data introduction into an advisory system.
Originality/value: The paper helps to understand the need of building advisory systems. It has a potential value for future entrepreneur.
Keywords: Project management; Expert system; Advisory system

1. Introduction

The theoretical basis of the following paper are issues concerning the scope of project management, as well as the advisory systems. The organizational structure is understood as the set of jobs positions and organizational sections inside the organization, however, the structure of the project team defines the group of people cooperating with one another to reach a common goal [1 - 4].

'Expert system' carries out certain multi-component tasks characterized by high intellectual demands, and performs it as well as a human being, who is an expert in the given field of knowledge. The notion of 'expert system' can be applied to all software programs, based on detailed knowledge, can draw conclusions and make decisions, acting closely to the way humans act and reason. 'Expert systems' can be divided into three categories: critical, decision-making, and advisory. The latter presents solutions for the user and is capable of evaluating their quality (a given solution can be discarded and new solution can be required) [5 - 7].

The paper presents the problem of creating an advisory system which supports the user's decision making, in the scope of adjusting an appropriate organizational structure and project team to a chosen project [8]. In order to achieve this process, the Exsys Professional has been used, the

software suggested by Exsys Inc., in which – with the help of rule editor – the advisory system was created [9, 10].

Furthermore, the system was supplemented with a help tool – a database. The data base as such was created with the use of Microsoft Access 2000, an integral part of Microsoft Office for Windows.

2. Adjusting structure to project

The inspiration to create an advisory system was the difficulty in finding detailed information determining the ways of adjusting to an appropriate structure to the project. After an in depth analysis the information can depend on, as follows [11, 12]:

- type of project (according to its origin – internal/external, according to the way it is oriented on – process/object, according to its maturity – low/high, according to its size - small/medium/large),
- number of staff working on a project full-time,
- role of project manager and his/her authorities, since it depends on him/her how the project is to be carried out,
- environment (encoding data coming from the environment in order to process the data into information which, as a result, serve to make decisions influencing the environment),
- names of jobs, especially in those projects which require cooperation of several managers,
- number/of administrative staff needed in the realization of the project.
- project team: educating (ex. data assembly), standardization (ex. experimenting), conflicts (ex. lost ideas), re-modeling (ex. problem solving).

In the created advisory system appropriate structures were adjusted to the project on the basis of characteristic features of the project (origin, orientation, etc) and features of the team project (number of teams, realization of tasks, etc).

3. The structure of advisory system

In the structure of advisory system, based on a detailed analysis and available data, variables, qualifiers and choices have been defined [13, 15]. Basis on the ones mentioned above, rules which are the basis of the system, have been created. In the advisory system, as variables a set of organizational structures was accepted assumed. Once the process of searching through the database is completed, can the group of structures enable the adjustment of proper organizational structures to them. Chosen variables are presented in table 1 have been.

Table 1.
Selected variables, which are used in advisory system

No	Name of variable
1	Linear
2	Clean project
3	Mixed project
4	Balanced matrix

In order to enter data into the advisory system sixteen qualifiers – questions have been defined and they should be answered by system operator. Example answers have been shown in table 2.

Table 2.
Qualifiers used in advisory system

Qualifiers	Qualifiers value
What is the origin of the project?	External
	Internal
	External/Internal
Is the project going to be: (importance for the organization)	Main project
	Additional project completed order
	One of many completed projects

In the advisory system predictable solutions were presumed. In order to do so organizational structure is applied (simple, operational, project, matrix, task, classic, flexible, global, stable) and four example models of project teams of isomorphic, expert, collective, surgical taking into consideration all demands in 2 stages.

Stage – I. Right number of points in the range from 1 to 5, is added depending on the weight criterion on the solution (fig.3). The next stage is a variable choice about the highest number of points and assign it into right organizational structure.

Table 3.
Influence of the individually selected criterions for the choice of the organizational structure; where: 1 – very small, 2 – small, 3 – medium, 4 – large, 5 – extra large

No	Criterion	Weight
1	Origin of order	2
2	Level of novelty	3
3	Time of duration	5
4	Number of team members	4
5	Way of employment	1

As a solution the system chooses the an optimum organizational structure. The number of points has an influence on the importance of individual criterions. The best solution fulfils most important about the highest importance. A conclusion has been carried at on the basis of stage count of points (fig. 1).

Stage – II. The assignment to the suitable team project has followed to selected organizational structure (tab. 4.) The project team had been adjusted according to the basis on database (figs. 2 and 3), which helps the user to adjust four example models of team project to earlier selected company organizational structure. Adjusting the suitable structure to the project can depend on many factors such as: type of project, number of staff on the project full-time, and role of the project manager his/her authorities.

However, because of the lack of detailed information from the range of adjusting structures, while creating a database only taken into consideration (the person's role, responsible for a team) (the "none" means that a certain team head did not posses responsible for the team) and individual team members both in organizational structure and project team. The database is a resource and a concise help tool, a perfect completion during the use of advisory system. It allows the user to adjust into more detailed structures within a selected project.

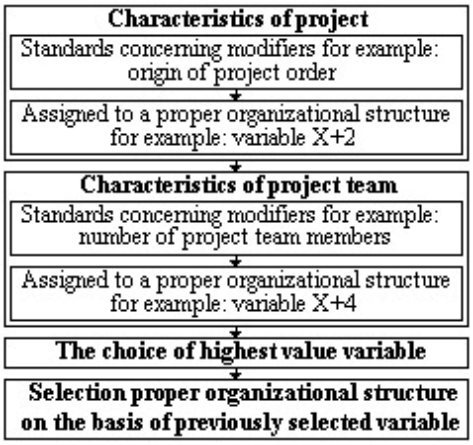

Fig. 1. Stage I – structures of advisory system

Table 4.
Structures of project teams, which fit to right organizational structures

Type of structure project teams	Type of organizational structure	Group of structures	
Isomorphic	Classic	Linear	
	Operational	-	
	Matrix	Weak matrix	
		Strong matrix	
		Balanced matrix	
	Project	Clean	
		Mixed	
	Global	Zone criterion	Geographic
			Regional
Expert	Elastics	Matrix	
	Classic	Functional	
	Stable	Bureaucratic -centralized	
Collective	Flexible	Team	
Surgical	Classics	Ordnance	
	Task	Matrix	

Fig. 2. Stage I – Start form of database

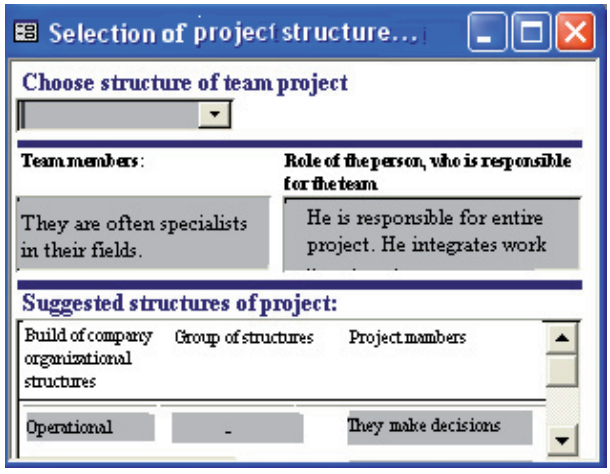

Fig. 3. Interface of user

The solution presented an at the end of the system is the best, adjustment to the requirements organizational structure with suitable a project team to it. The solutions represented by the system are not the optimal solutions. The advisory system is only a tool helping in making decisions.

4. Examples of system work

In figs are 4 and 6 further work is presented of the advisory system, from specifying qualifier values to solutions, proposed by the system [15].

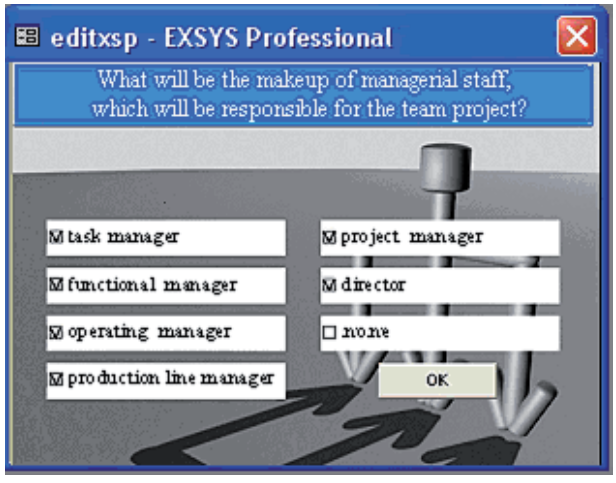

Fig. 4. Step 16 – choice of makeup staff, which is responsible for project team

System asks the operator a question: "What will be the makeup of managerial staff, which will be responsible for the team project?" and it suggests seven possibilities: task manager, functional manager, operating manager, production line manager, project manager, director (i.e. only a individual unit takes actions and makes decisions),

none (i.e. all members of team together take actions and make decisions). Operator of the system can choose one or a few answers depending on his/her planned staff demands (fig.4).

On the fig. 5 system has presented the best solution, which fulfil the most important criterion – selected organizational structure: lineal classic and project structure: isomorphic. The other part of the window, the advisory system has adjusted to a project team structure together with the scores into other organizational structures.

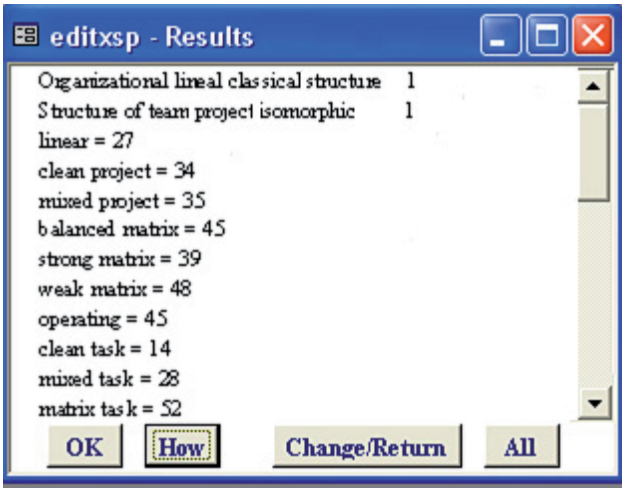

Fig. 5. Step 17 – solutions suggested by the system

Presentation of solutions in graphic form helps to formalize with the fig. 6. of the presented structure. On the fig. 6 the advisory system presented two structures such as: classic linear organizational and isomorphic project team.

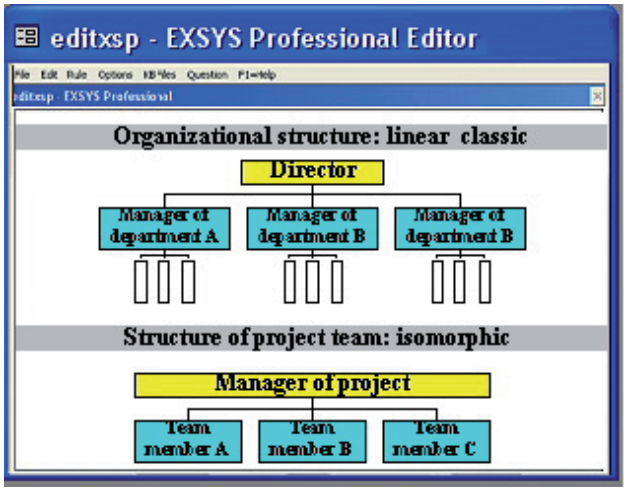

Fig. 6. Step 18 – presentation of graphic solutions

5. Conclusions

The paper presents a problem of building advisory system (which was created in Exsys Professional program) which helps the user to make decisions in the range adjusting the suitable right organizational structure and team project to selected project. This should be underlined that created advisory system is a simple and flexible computer tool, which instantly suggested a solution or solutions with a graphic presentation of results, after getting answers on the questions. The report generation can be used in advisory system to document analysis and to make proof.

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