

Accounting software using expert systems

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Abstract: - In this paper is presented the efficiency of using expert systems in the economic environment. The aim of this paper is to create an expert system prototype in order to decide how to evaluate the projects funded by European Union funds.

Key-Words: - expert systems, accounting software, EU funds, Exsys Corvid, knowledge base, Logic Block

1 Introduction

Under the name of “expert system” are those knowledge based on artificial intelligence programs or device of high level, comparable with the most competent experts in an application field and where, these programs can achieve thinking and intuition performances similar to human experts. “Expert system” term is used with the same meaning as “knowledge-based expert system”, being preferred because of its easier pronunciation. Software development was done using Exsys Corvid expert system.

2 Evaluation of projects funded by European Union funds

This issue is one of present interest for Europe and especially for our country, Romania, a country in stage of post-adheration.

2.1 Knowledge base creation

When one want to create an expert system prototype aiming to decide the way of EVALUATION projects funded by European funds; the prototype will be named EVALUATION having in view the knowledge base subject. From this time one can proceed to create a new knowledge base or consulting and updating the existent one. In case one decides to create a knowledge base for an expert system prototype of EVALUATION future projects funded by European funds, one shall use File from Main Menu and then option New from submenu. In Expert System Name window, in File name box will be introduced EVALUATION knowledge base name.

If EVALUATION already exist, with the aid of Open button from submenu related to File option from Main Menu can be opened knowledge base. When the knowledge base is created for the first time, will be activated a window which enables the establishment of work variables (see Figure 1)

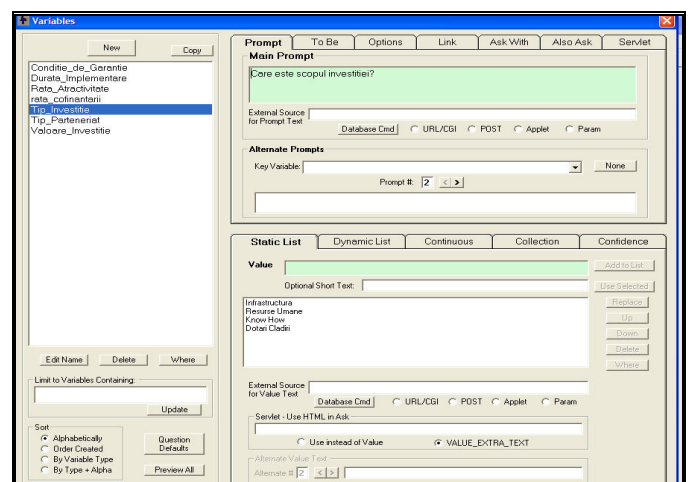


Fig. 1 Knowledge base creation

The minimum of information that must be considered when generating a knowledge base can be found in the following compulsory steps to go in order to get from this pattern: subject of knowledge base and its author. Also in this control panel can be mentioned: working method with certainty factor for working goals, knowledge base scroll way, enabling/disabling rules displayed during the execution, enabling/disabling new rules test concerning how the knowledge base works, the beginning and ending text have also be displayed when consulting knowledge base, as well as minimum limit that displays certainty factors related to goals.

After mentioning the compulsory knowledge base subject and author, and any other items listed above, EXSYS Corvid expert system generator proceeds to goals' takeover by displaying a working window which Main Menu will contain: Logical Block, Action Block, Command Block, Variables.

When it is necessary can be achieved several logical blocks, each one having a preestablished function. The introduction of a purpose in knowledge base is achieved by enabling LOGIC BLOCK page, when becomes active a window to takeover the goals.

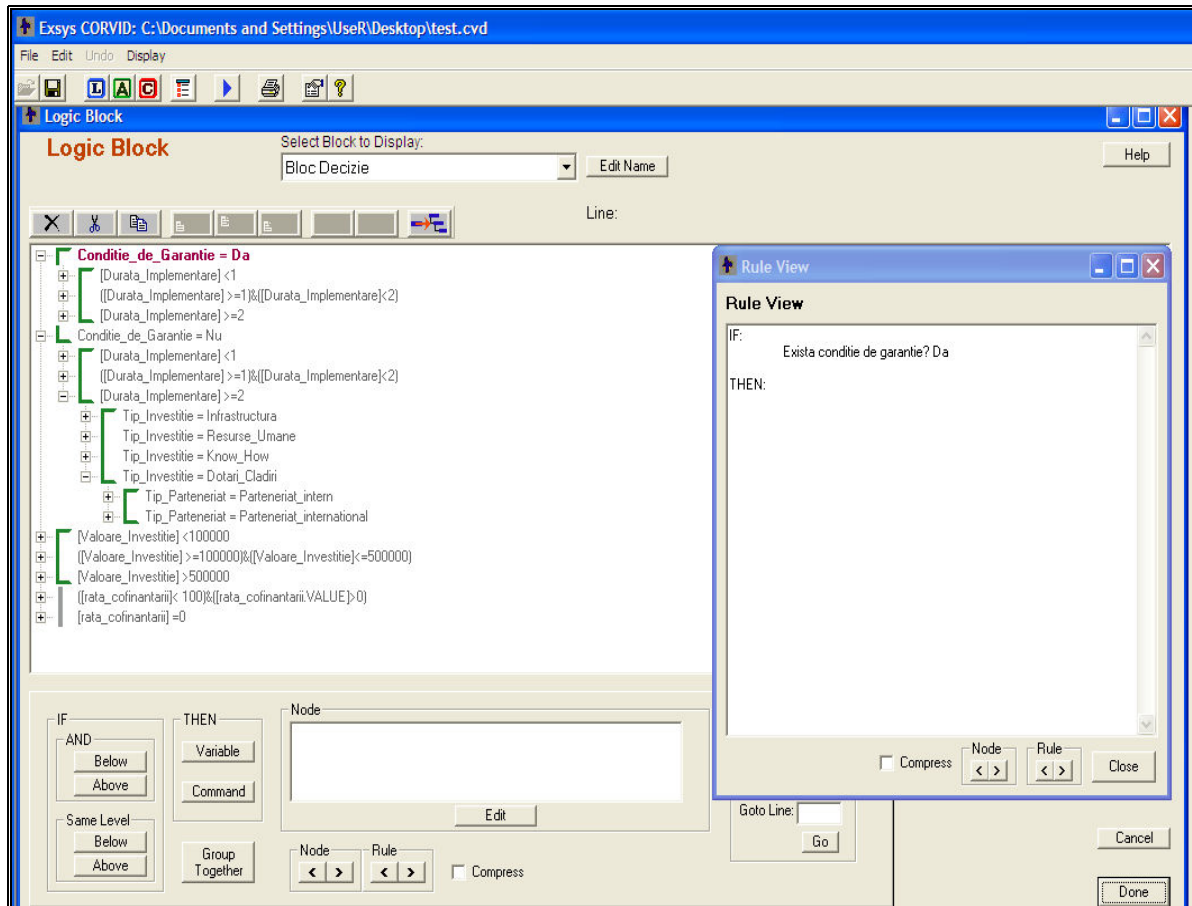


Fig.2 Editing window of Logic Block

In this case one must have in view a single purpose, namely to determine attractiveness scale of a project funded by European structural funds.

After purpose introduction can proceed to formulate the first rule. From one's experience and respecting the general principle applied to design software products, one recommends based on the analysis problem to be solved to proceed to the introduction of the following knowledge pieces: goals, questions and variables specific to EXSYS Corvid generator.

From a brief analyse of field and problem that must be solved we have the following knowledge pieces:

Puposes:

1. Determination of attractiveness scale

Questions:

1. There is a warranty condition?
2. What is the duration of implementation (in years)?
3. What is the purpose of investment?

4. What type of partnership is involved?
5. What is the value of investment (in euro)?
6. How is the co-financing scale of the project?

Variables:

1. Warranty conditions
2. Implementation time
3. Attractiveness scale
4. Co-financing scale
5. Investment type
6. Partnership type
7. Investment value.

Rules building requires the enabling of a window from figure 2 that allows you to add, to modify, to delete and to move a rule, but the structure of a rule can be viewed by Rule View (figure 3). Following the introduction of a rule from this page is obtained a pattern of takeover knowledge pieces within IF-THEN-AND components. As can be seen from figure 3 is mandatory to fill in IF and THEN part.

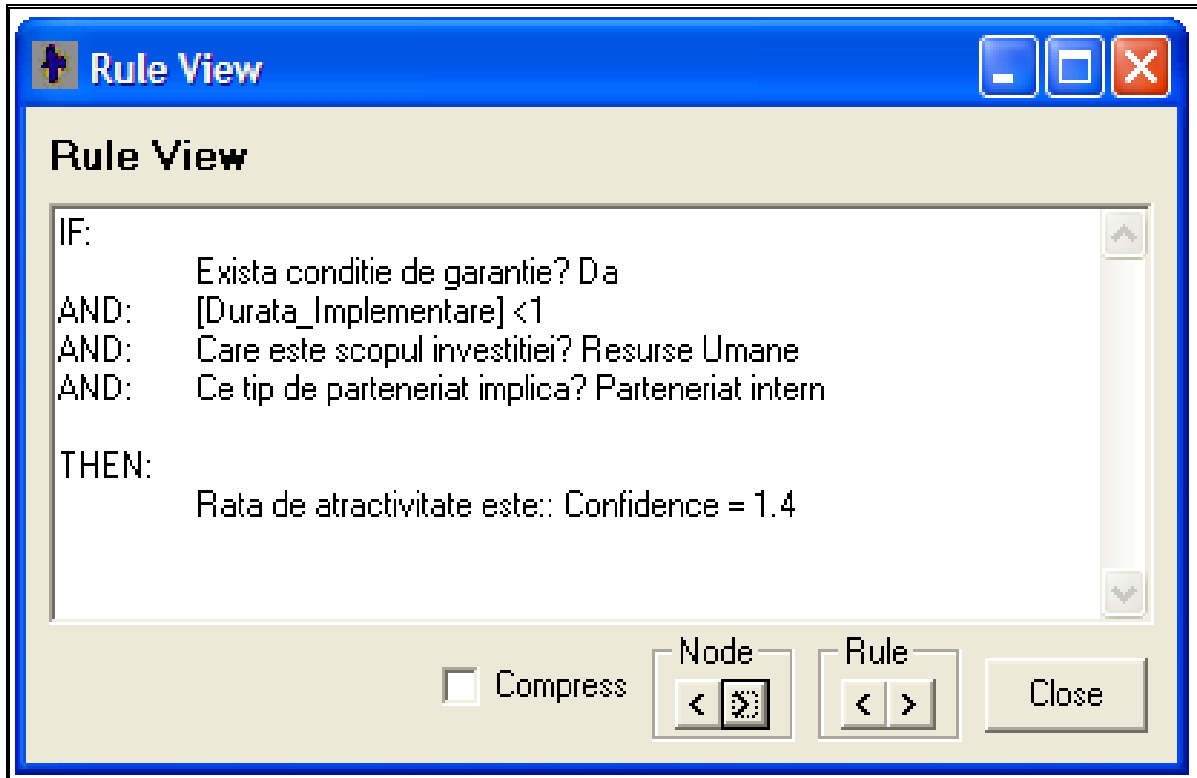


Fig. 3 Introducing rules window

In premises category one can have knowledge pieces in the form of questions, variables, goals (if one wants to test the achieved level of certainty factors). The same components are also found in the conclusions category, indicating that goals are followed by an value

assignment for certainty factor of versions specified in control panel parameters. Logic Block windows which contain set of multiple rules for obtaining the desired decisions are founded in Figures 4, 5, 6.

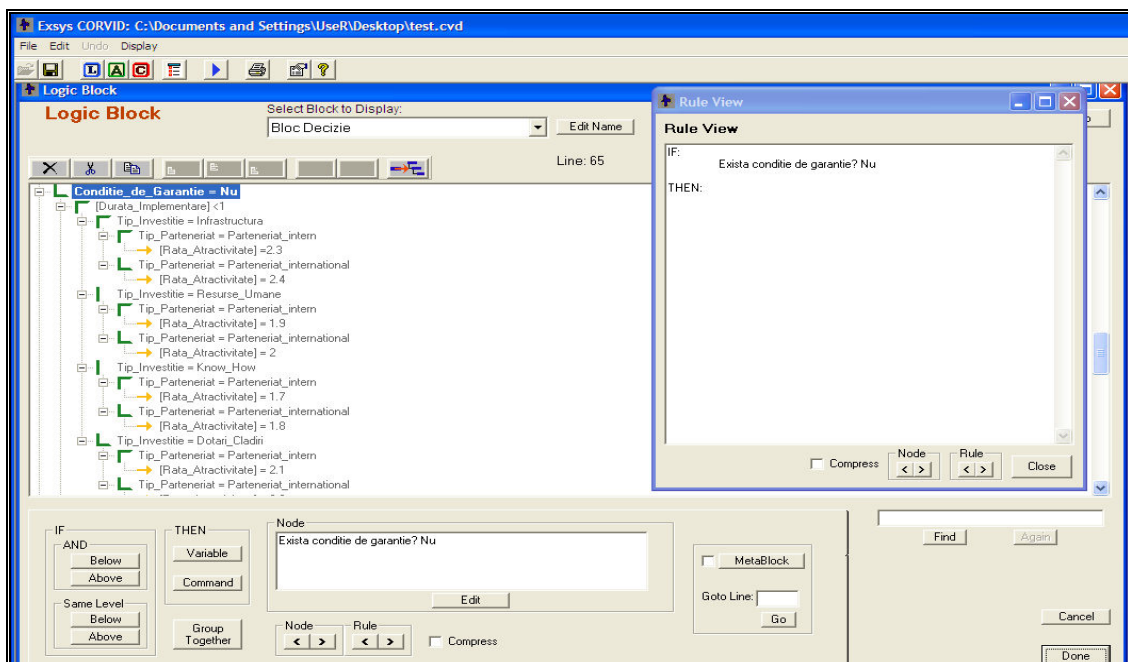


Fig. Editing window of Logic block

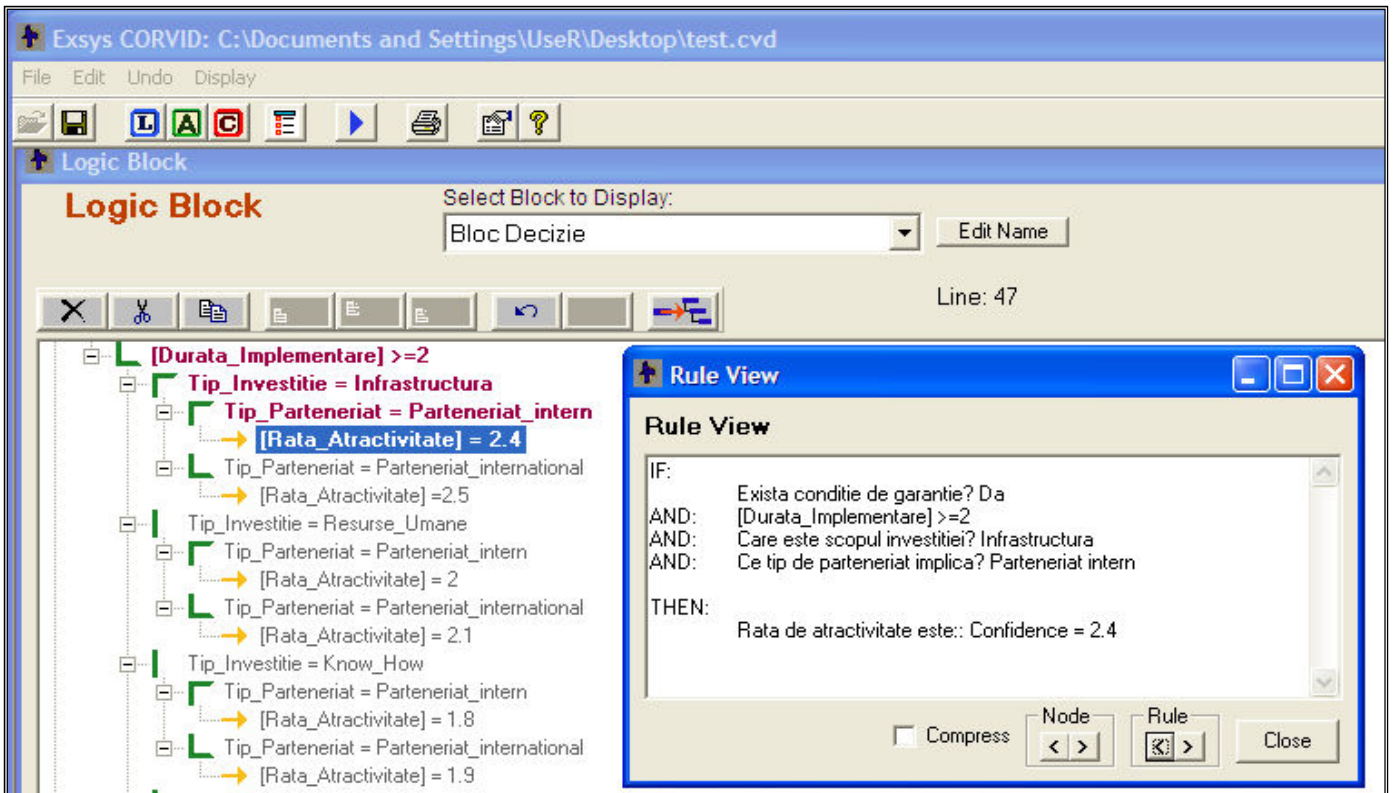


Fig. 5 Editing window of Logic block by highlighting a compose rule.

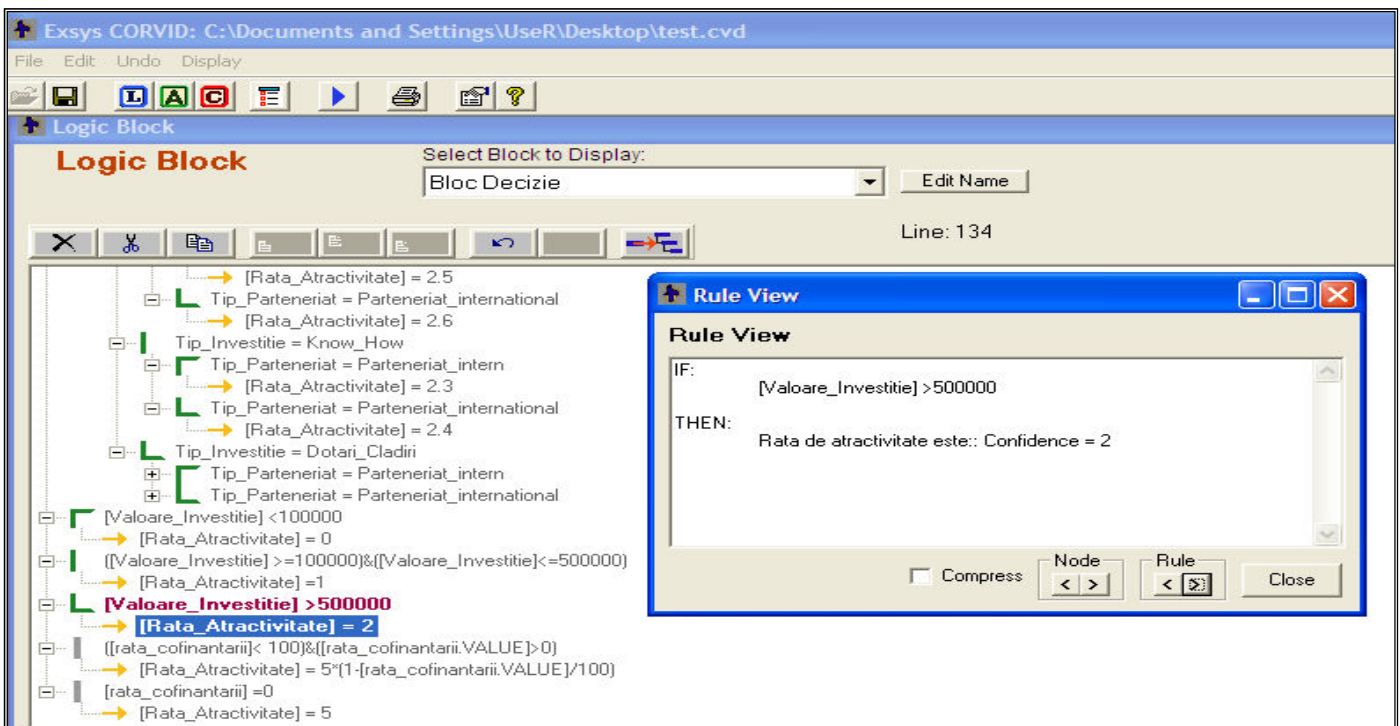


Fig. 6 Editing window of Logic block by highlighting a simple rule.

The Control panel allows you to print as a file or directly at the printer all knowledge pieces in a continuous way or on different pages. Knowledge base due to EVALUATION prototype was redirected to „PROJECTS” file from EXSYS working directory. Because knowledge base is wide, further to be extracted rules that intervene in the selection of a

infrastructure project:

Subject:
Evaluation of structural projects funded by
European funds
Author:
Doina Darvasi

Starting text:

EXSYS CORVID EXPERT SYSTEMS FOR
DECISION MAKING, OF EVALUATION
STRUCTURAL PROJECTS FUNDED BY
EUROPEAN FUNDS

Ending text:

FOLLOWING EXSYS EXPERT SYSTEM
CONSULTATION THERE WERE REACHED THE
FOLLOWING CONCLUSIONS:

Uses all applicable rules in data derivations.
Probability System: 0 - 10

DISPLAY THRESHOLD: 1

GOALS

Determination of the attractiveness scale of a project
financed by European structural funds.

RULES:

RULE NUMBER: 1

IF:

There is a warranty condition? Yes

AND: [Implementation_duration] <1

AND: What is the investment goal?

Infrastructure

AND: What type of partnership is involved?

Internal partnership.

THEN:

Attractiveness scale is: Confidence = 1.8

RULE NUMBER: 2

IF:

There is a warranty condition? Yes

AND: [Implementation_duration] <1

AND: What is the investment goal?

Infrastructure

AND: What type of partnership is involved?

International partnership.

THEN:

Attractiveness scale is:: Confidence = 1.9

RULE NUMBER: 3

IF:

There is a warranty condition? Yes

AND: ([Implementation_duration]>=1)&([
Implementation_duration]<2)

AND: What is the investment goal?

Infrastructure

AND: What type of partnership is involved?

Internal partnership.

THEN:

Attractiveness scale is::: Confidence = 2.1

RULE NUMBER: 4

IF:

There is a warranty condition? No

AND:[Implementation_duration] <1

AND: What is the investment goal?

Infrastructure

AND: What type of partnership is involved?

Internal partnership

THEN:

Attractiveness scale is: Confidence =2.3

RULE NUMBER: 5

IF:

There is a warranty condition? No

AND: [Implementation_duration] <1

AND: What is the investment goal?

Infrastructure

AND: What type of partnership is involved?

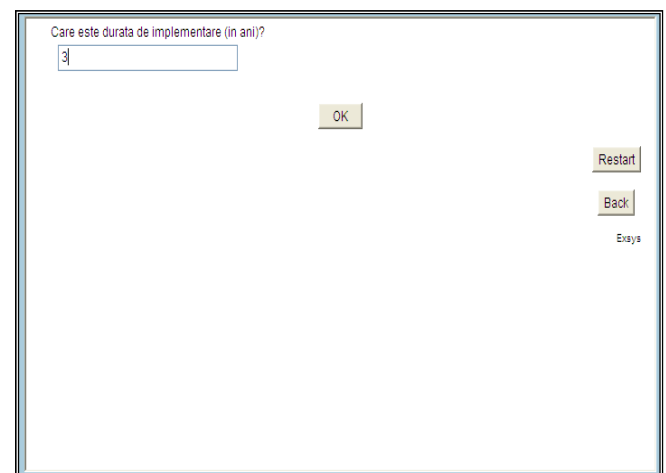
International partnership.

THEN:

Attractiveness scale is: Confidence = 2.4

3 Running program

Program launching is achieved using **Options** button
from Main Menu, by activating **Run** option (Fig.7)



Ce tip de parteneriat implica?

Parteneriat intern

Parteneriat international

OK

Restart

Back

Exsys

Cat este rata de cofinantare a proiectului (in %)?

10

OK

Restart

Back

Exsys

Fig. 7 EVALUATION knowledge base execution

Care este scopul investitiei?

Infrastructura

Resurse Umane

Know How

Dotari Cladiri

OK

Restart

Back

Exsys

Ce tip de parteneriat implica?

Parteneriat intern

Parteneriat international

OK

Restart

Back

Exsys

Care este valoarea investitie (in EUR)?

500000

OK

Restart

Back

Exsys

4 Conclusion

By using an expert system has been optimized the decision making process in case of projects evaluation funded by European Union structural funds.

Compared with decision making traditional methods, time and accuracy is gained.

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