Automation methodology for complex technical-organizational systems

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Modern enterprises, as complex technical-organizational systems

- becoming increasingly complex both in structure and in internal connections between structural components;
- continuously generate huge amount of data available for analysis;
- require rapid response according to changing conditions.
Solution

Development of automation means that ensure the achievement of goals in conditions of significant uncertainties, especially in the context of long time horizons.
Rapid modification requirements

Currently, the growth rate of requirements for information systems and the necessity for their modification during operation is very high. Very often there is the necessity to modify the existing data structure, the way of data displaying, new data processing scenarios appear. Involving developers to solve such problems is usually costly both in terms of time and financial expenditures.
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Traditional approach
Traditional approach - disadvantages

- semantic gaps in the transfer of information from an expert to a knowledge engineer and from a knowledge engineer to developers;
- duplication of data in the system;
- the complexity, and, often, the inability to organize relationships between data in different modules;
- the necessity to involve developers to create new system applications, make changes to the logic and displaying data in the existing applications.
Proposed methodology
Proposed methodology - advantages

- the semantic gap is being eliminated;
- the involvement of developers is only necessary in a situation when it is necessary to develop new or adjust existing tools of the environment;
- the expert must have only basic programming skills;
- the efficiency of the implementation of system’s information and analytical processes, within the framework of the existing tools, is high.
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Software-instrumental environment

Authentication and authorization

Expert

Ontological component

Analytical component

User

User-interaction component

Background processes
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Ontological component

Class tree

Directories

Enumerations

Object tree

Applications setup

Reports setup
Analytical component

- Internal language
- Neural supervisor
User-interaction component

- Applications
- Reports
- Data import
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Class tree
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Internal language
Conclusion

The traditional and proposed approaches have been compared. It was shown, how the proposed approach grants the elimination of semantic gaps in the transfer of information from an expert to a knowledge engineer and from a knowledge engineer to developers as well, as other disadvantages.

The main disadvantage of proposed methodology – is the complexity of development of described software-instrumental environment.
Thank you for attention!

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