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Development of Risk Management Tools in Question-Answering Based Software Design Environment

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ABSTRACT- THE MAIN PURPOSE OF THE STUDY IS DEVELOPING RISK MANAGEMENT TOOLS IN SOFTWARE DESIGN. THESE TOOLS SHOULD BE APPLICABLE TO RISK SITUATIONS MONITORING AND PROVIDING TIMELY RESPONSE TO RISK SITUATIONS OCCURRENCE.

KEYWORDS- RISK MANAGEMENT, SOFTWARE INTENSIVE SYSTEMS (SIS), INFORMATION TECHNOLOGY (IT), WORKING IN THE QUESTION-AND-ANSWER (WIQA), QUESTION-ANSWER (QA)

الخلاصة

الغرض الرئيسي من الدراسة هو تطوير أدوات إدارة المخاطر في تصميم البرمجيات. حيث يجب أن تكون هذه الأدوات قابلة للتطبيق على مراقبة حالات الخطر وتقديم الاستجابة في الوقت المناسب لحدوث حالات الخطر.

الكلمات المفتاحية :إدارة المخاطر , النظم المكثفة تكنلوجيا المعلومات, نظام (WIQA) السؤال و الجواب.

1. Introduction

Today one of the main problems in design of Software Intensive Systems (SIS) is extremely low design success level. The Standish Group International in their report shown success level as low as 35%. According to experts, all the problems arising in the development of IT projects should be identified as risks. The actual task for IT projects is the development of a system of events that allows managing possible risk events in projects developing IT products.

To achieve this goal of development risk management tools, it was necessary to solve a number of problems, including the analysis of situations in which it is necessary to carry out risk management, develop risk management methodics and software tools to implement these methodics and perform an experimental assessment of the practical applicability of the developed risk management tools.

The approach developed by WIQA to the question-and-answer presentation of project allows developers to fully describe the risks and their interrelations, without violating the integrity of the design solution. The use of this approach in the future should eliminate, to the

minimum, the detrimental impact of the human factor. The structure of tasks used in WIQA will allow to display the interrelation of factors and explain the influence of team actions on the project and the development of events.

2. Task of risk management tools design

Risk management of the implementation of program projects is a package of measures to identify, evaluate, prevent and control project risks. There are three main risk behavior strategies:

- Prevention of risk;
- Transfer of risk;
- Acceptance of risk.

Next picture shows main actions of risk management:

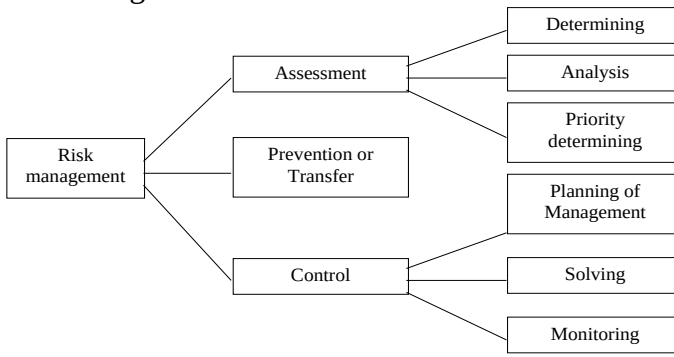

Fig.1. Risk management actions

The implementation of the risk management toolkit in the WIQA environment makes it possible to use the existing implementation of the pseudo-code programming language together with the software / card management environment.

Taking into account what was discussed in the chapter, an expanded statement of the problem of risk management is as follows:

Z * 1. Develop a set of methods and tools for risk management in the design process that helps to reduce time costs and minimize the likelihood of risks through the inclusion of additional programmable components in the management of project activities.

2. The mechanism of additional programmable components offered by a set of tools should be oriented towards participation in their implementation of designers who perform the work assigned to them in accordance with the plans.

3. To reduce the cost of developing a set of risk management tools, you should orient it by input and output data to work with the question-answer tool environment WIQA.

3. Risk management tools architecture

The risk management system is a set of components that run in a WIQA environment. Since one of the most important features of this system is its close integration with the WIQA design environment, the most effective way to present information about project risks is to map them to WIQA memory as a pseudo-code database.

Since the most natural way to work with pseudo-code databases is the LWIQA language used in the WIQA environment, the most efficient is the pseudo-

code implementation of the functioning mechanisms of the developed system in the form of pseudo-code procedures. The diagram editor available in the WIQA environment allows user to implement a graphical user interface that provides a call to these procedures, thereby integrating them into a single system.

The next figure

shows the architectural model of the risk management system:

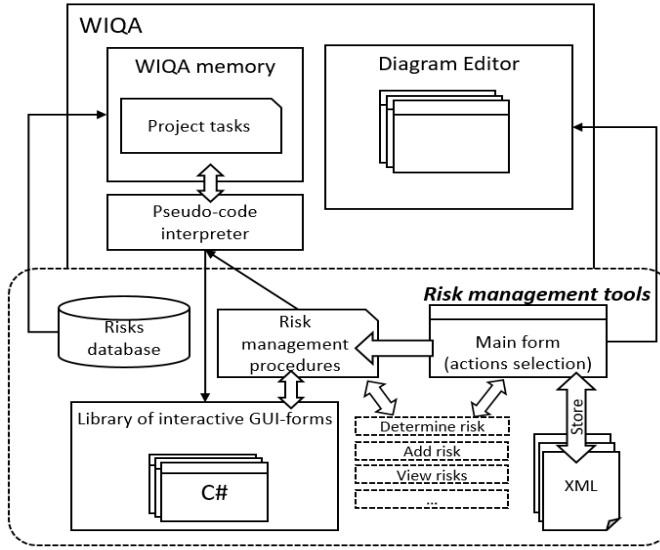

Fig.2. Architectural model of the risk management actions

From the introduction to this paper it follows that the software tools for risk management should be developed in a question-answer (QA) environment that supports design. Such an environment is the WIQA system, which is developed at the Department of Computer Science of the Ulyanovsk State Technical

University. A key feature of this system is the question-answer semantic memory, which allows storing in the question-answer format any data, including the project data, and also providing the ability to manage these data.

4. Realization of the risk management tools

Thus, the orientation of the developed risk management system to work in the question-and-response memory allows to ensure its integration with the existing means of supporting project solutions.

The main interface should implement the following functionality:

- Display of a summary of information about risks;
- Calling up a list of risks;
- Export risks to XML / DOC.

The following figure shows a diagram of the interface forms of the system being developed:

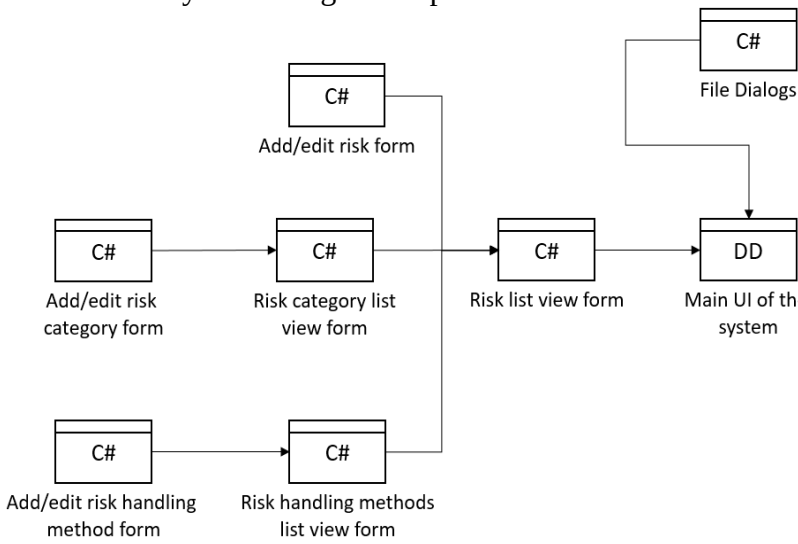

Fig.3. User interface diagrams form

The first form with which the user interacts is the form of the project's list of risks, which allows you to quickly see the list of active risks of the project. This form is presented in the following figure:

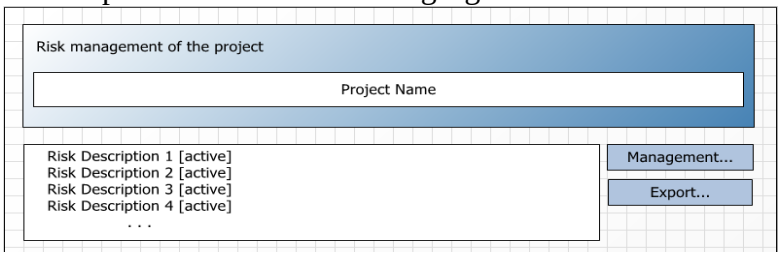

Fig.4. User interface diagrams form

Project risk management requires the storage of a specific set of associated data. First of all, this is information about the very risk of the project. This information should include a textual description of the risk, information about the timeliness of the current risk, its status, as well as the category of the risk involved and the method of handling this risk. Basically, these data can be represented using simple data types, such as an integer, a string, a date. However, it is not possible to describe such risk properties as the risk category and the method of processing it with simple data types, since they are composite. Let us consider them in more detail.

A risk category is a risk classification tool that can affect both the risk assessment characteristics, its potential damage, and the choice of the risk management method. In addition, the set of risk categories can be expandable, since projects can have significant differences among themselves, and the developed risk management system is adaptable.

The risk management method should include at least the following information:

- Identifier of the risk management method;
- Name of the risk management method;
- Reference to the risk management methodology.

Since the design of the risk management system is carried out in the conditions of using it in a WIQA environment, the risk management techniques are most logically implemented as pseudo-code procedures that can be performed by a person, step by step, or by a computer, if they contain an algorithm suitable for execution by the central processor.

As mentioned above, a pseudo-code database is used to store risk data. Therefore, we can distinguish three main entities - risk, risk category and risk management method. The relationship between the risk category and the method of processing it is a many-to-many relationship. For its implementation in the pseudo-code database, which is a kind of relational database, it was required to enter another entity - a group of methods for processing risks. Thus, the database schema contains four tables: Risk, Category, RiskMethod and RiskMethodGroup.

5. Conclusion

There is a large number of risks associated with the creation of high-quality software for software-intensive systems in a timely manner and within the budget. In order for the design result to be successful, the risks must be compensated by an appropriate reward. The greater the risk, the greater the reward. When developing software for automated systems, the positive effects

achieved as a result of their development are high, but there is also the potential for failure.

Therefore, there is a need to reduce this potential by implementing effective risk management tools. This system should provide assistance to the project manager in developing risk response measures, based on reliable information that can be obtained from various sources, including from previous experience in the development of automated systems. Reliable and more detailed information allows making more effective decisions, which in turn reduce the possibility of risk occurrence, as well as negative consequences arising from the implementation of risk.

References

1. Khansaa Azeez Obayes Al-Husseini. Methods and Means of Risk Management in the Design of Automated Systems. Master's dissertation, UlSTU, 2017.
2. Al-Husseini, Khansaa Azeez Obayes. Risk Management Tools In The Design of Automated Systems. INTERACTIVE SYSTEMS: Problems of Human - Computer Interaction. – Collection of scientific papers. − Ulyanovsk: USTU, 2017. − 290 p.
3. Lapshov, Y.A. Pseudo-Code Programming of Workflows in Conceptual Designing of Software Intensive System / Y.A. Lapshov, V.A. Maklaev, P.I. Sosnin // Interactive Systems: Problems of Human – Computer Interaction. – Collection of scientific papers. – Ulyanovsk : UlSTU, 2013. – C. 40-52.

4. Sosnin, P.I. Programmable Managing of Workflows in Development of Software-Intensive Systems / P.I. Sosnin, Y.A. Lapshov, K.V. Svyatov // The 27th International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems, Volume: Part 1. – At Kaohsiung, Taiwan, 2014.
5. Allison Robin. MSF Risk Management Discipline v.1.1, 2002.
6. OBAID, Ali Hamzah. Information hiding techniques for steganography and digital watermarking. UDC 681.518 (04) INTERACTIVE S< STEMS: Problems of Human-Computer Interaction.–Collection of scientific papers.- Ulyanovsk: USTU, 2015.- 306 p. 2015.
7. Obaid, Ali Hmazah, Tools for conceptual-algorithmic prototyping in solving design problems in the development of systems with software,
   Interactive Systems: Problems Of Human-Computer Interaction Ulyanovsk: USTU, 2015.-25-27 P.
8. Khansaa Azeez Obayes Al-Husseini, Information security in the field of technical development and information, Interactive Systems: Problems Of Human-Computer Interaction Ulyanovsk: USTU, 2015.

