Запропоновано теоретичні основи управління автоматизованими системами формування портфелів проектів з безпеки життєдіяльності, побудованих на основі використання комбінованих методів прийняття рішень. Показано використання комбінованих методів прийняття рішень, що дозволить забезпечити автоматизацію відбору складових проекту чи портфелю проектів з врахуванням їх складності та ієрархічності

Ключові слова: інформаційні технології, портфелі проектів, безпека життєдіяльності, автоматизація

Разработаны теоретические основы управления автоматизированнными системами формирования портфелей проектов безопасности жизнедеятельности. Проанализирована целесообразность выполнять моделирование задач выбора и формирования портфеля проектов безопасности жизнедеятельности на основе графических и математических способов

Ключевые слова: информационные технологии, портфели проектов, безопасность жизнедеятельности, автоматизация

Theoretical basis of projecting the automatic systems of grounding project portfolio of vital activity safety are developed. Combined method of optimization is developed. Appropriateness for modeling tasks of choice and grounding project portfolio of vital activity safety based on graphical and mathematical ways is analyzed

Keywords: information technologies, project portfolio, vital activity safety, automation

INFORMATION TECHNOLOGIES IN STRATEGIC MANAGEMENT OF VITAL ACTIVITY SAFETY PROJECT PORTFOLIOS

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1. Introduction

The process of solving the problem of management of complicated systems, which also include the systems of human vital activity safety, is determined by significant quantity of information processing [1]. The only way in such situation is the involvement of electronic computers and automated systems of management constructed using such computers [2-4]. So automated systems of management can provide the development of high effective methods and systems for information selection and automatic data processing with aim to analyze, to evaluate risks, to control, to classify, to predict the state of complicated systems of human vital activity safety based on developed highly productive, problem-oriented and specialized structures with deep level of parallelization of algorithm concerning to solving the task of optimization the resource allocation in portfolio oriented management.

2. Purpose of article

Object of this article is development the theoretical principals of projection the systems of automated grounding project portfolio of vital activity safety.

3. Theoretical basis of projection the systems of automated grounding project portfolio of vital activity safety

Projection of the systems of automated grounding project portfolio of vital activity safety is considered as creation of high effective man-mathematical system, what include invention, technical and economic analyze and decision making process. In the projection process is accounted the entire set of values of situations and decisions in choosing the best

project environment and therefore project portfolio in it, what is the essence of such complex optimization approach. So the automated system of grounding project portfolio of vital activity safety should be considered as some interaction of technical progress, science and production (Fig. 1).
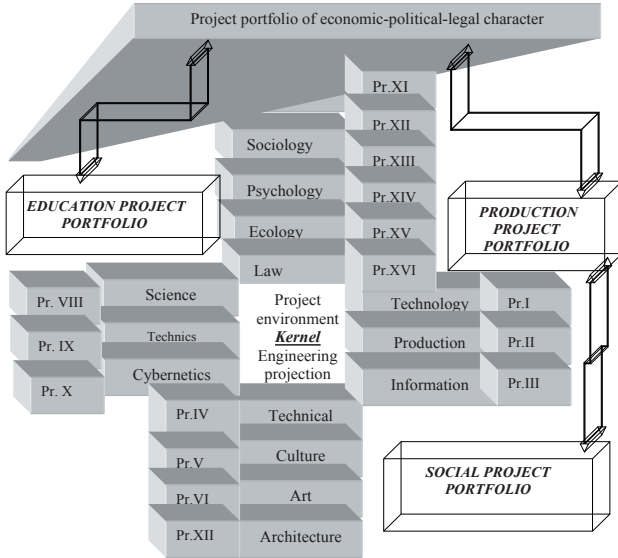

Fig. 1. Connections between engineering projection of vital activity safety project portfolio and different types of projects and project portfolio: where Pr. I, ..., Pr. XVI — set of values of the projects

Analyzing the above said according to Fig. 1 it must be noted that the procedures of grounding the project portfolio can be formally interpreted as the notion of semantic networks and computational models and submit a scheme. Fig. 2 shows the stages domain of specification tasks of getting ready (end) product in the form of optimized project or project portfolio of vital activity safety.
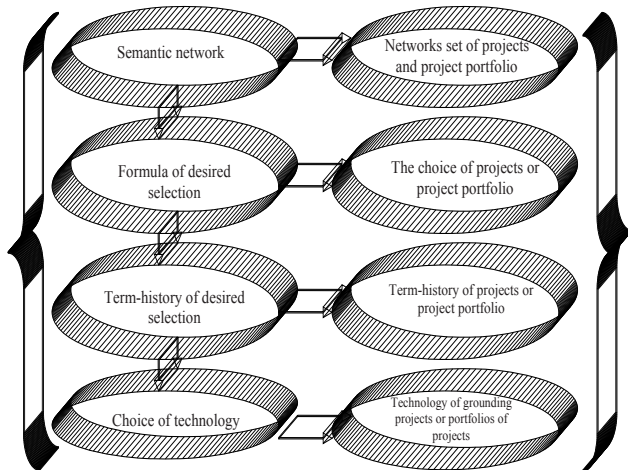

Fig. 2. Scheme of the domain portfolio-oriented environment with vital activity safety

Accounting that the limit of projection of the automated system grounding of vital activity safety project portfolios in some restrictions lies on development and formation the projects or project portfolio as some elements of system capable optimally perform a standing tasks. Considering the above

said we can present such limit of projection in next steps of projection (Fig. 3).

In general kind the process of providing an automation of grounding projects or project portfolios of vital activity safety can be presented in the scheme (Fig. 4).

Automated systems of grounding vital activity safety project portfolios are complicated system, that system that has a hierarchical structure.

The basis of design the system of automated grounding vital activity safety project portfolios on the level of engineering (system) analyzes is models construction (Fig. 5). Typically, verbal-deductive or verbal-logical modules are used on the first stage on level of technical task of projecting system of automated grounding of vital activity safety project portfolios. But these models are hardly intuitive and not suitable for any formal change of topology in automatic (machine) mode [5-7].

Application of adjacency matrices is easy representation, processing and storage in computers topology portfolio filling (environment) with an arbitrary number of projects. project has the following type.
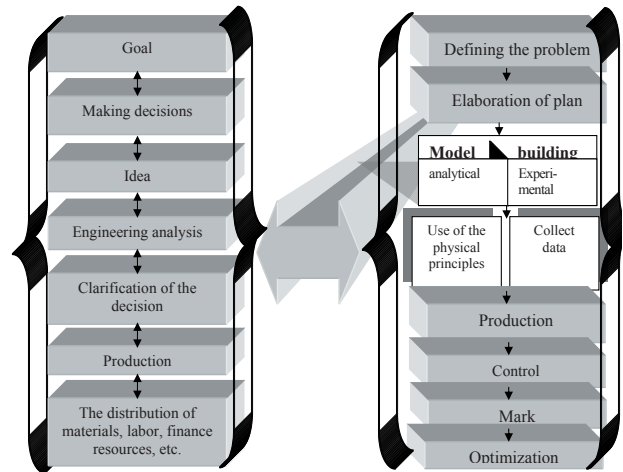

Fig. 3. Flow-chart of process engineering projection of automated system of ground vital activity safety projects portfolios
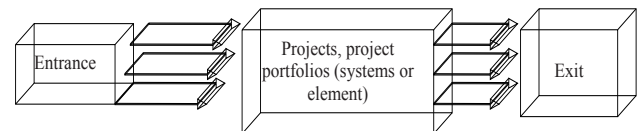

Fig. 4. Generalized scheme of automation study projects or portfolios of projects of vital activity safety
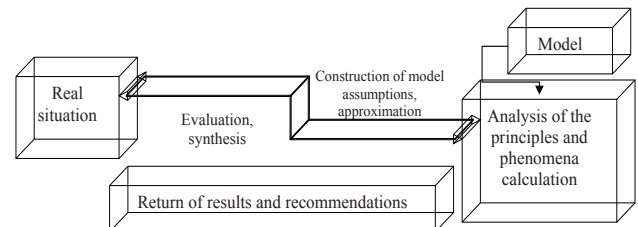

Fig. 5. Process scheme of engineering system analysis

Adjacency matrix A, which specifies the topology (system) project or portfolio, has the following type [8, 9]:

$$A = \begin{matrix} 1 \\ 2 \\ : \\ n \end{matrix} \begin{vmatrix} a_{11}a_{12}...a_{1n} \\ a_{21}a_{22}...a_{2n} \\ .... \\ a_{n1}a_{n2}...a_{nn} \end{vmatrix} \qquad (1)$$

where $\forall_{ay} \in \{0,1\}, i = \overline{1,n}, j = \overline{1,n}$, if $a_{ij} = 1$, this means that the elements i and j (projects) of topology are connected, and if $a_y = 0$, then there is no connection.

4. Conclusions

Theoretical principles of management of automated systems forming vital activity safety project portfolios are proposed, which are based on:

1. Modern methods of modeling for which two ways are involved: graphical and mathematical able to provide a convenient flexible user interface to simplify the process of project selection and visualization of the synthesized topology portfolio of vital activity safety.

2. Combined method of decision theory based on the methods of critical path and PERT.

3. Specialized computer systems and axiomatic abstract algorithms for solving a number of theoretical and applied problems on the selection of the elementary components of a project or projects portfolio, accounting their complexity and hierarchy.

This approach provides realization of all calculations using the computer as a universal calculator, what integrates the system of automated vital activity safety project portfolios with automated information-analytical system existing in national economy (including Government information and analytical system for emergencies and other public, formal and informal systems UN, NATO, etc.).

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