characteristics of the problem under consideration which is confirmed, in particular, by the feasibility of the probabilistic model of the general approach based on the real data.

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## Authors' Information


*Kuzemin A.Ya. – Prof. of Information Department, Kharkov National University of Radio Electronics, Head of IMD, Ukraine, e-mail: kuzy@kture.kharkov.ua*

*Liashenko V.V. – senior scientific employee, Kharkov National University of Radio Electron, Ukraine*


# THE APPROACH TO DEVELOPMENT THE HUMAN RESOURCES INTELLECTUAL MANAGEMENT SYSTEM. MANAGEMENT PROCEDURES.


Roman Benger, Elena Antonova



*Abstract: The Article suggests an approach to designing the Human Resources Intellectual Management System in order to increase Human Resources reliability, using the management methods known from the Theory of Management.. The Article examines the realization of the Subsystem of implementing management methods by the number of management procedures, executing the corresponding management method.*



*Keywords: The theory of unreliable elements, The knowledge system, The intelligent control, KDS.*


## Introduction

Management is a complex and multi-level process, covering all the spheres of human activity, and the most complex and unreliable elements of this process are people (human resources). In any managing system, the person's actions depend on numerous factors, and many actions are carried out spontaneously or thoughtlessly.

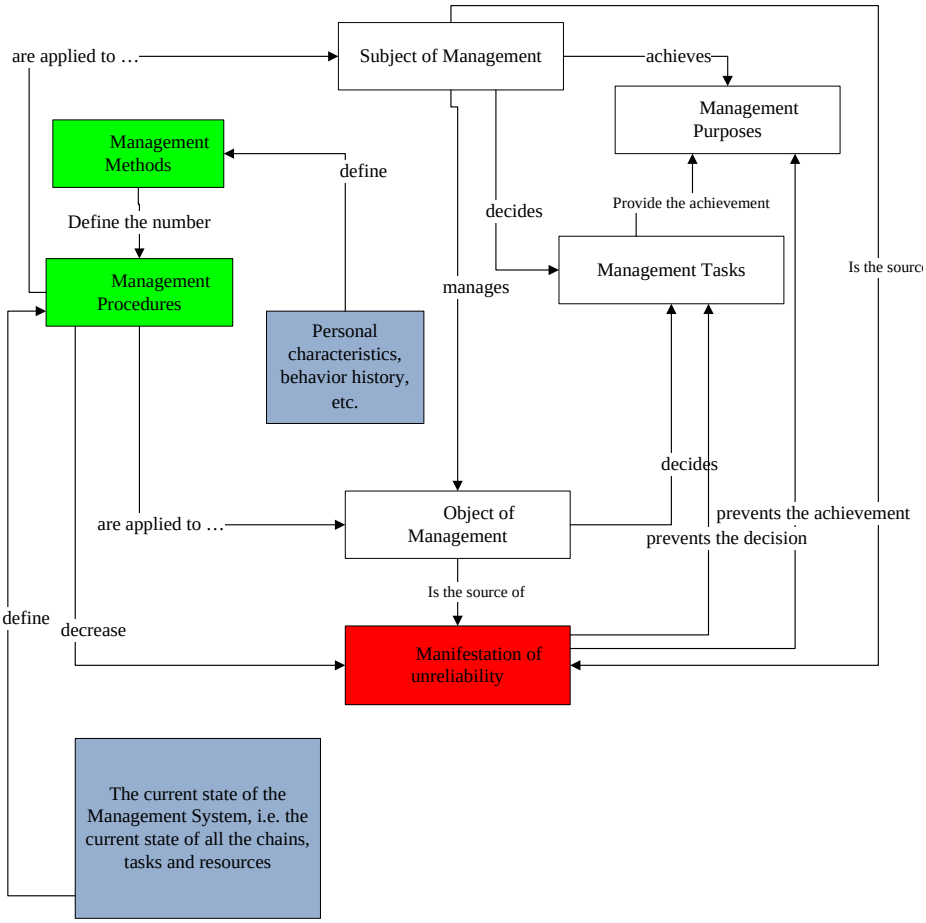
In order to control the people as the Management Process element, the Science of Management develops the methods of influence and motivation, basing on the number of human psychological peculiarities.

The informational management systems, existing now, do not fully consider all the aspects of the human resources as the “unreliable” element. To realize the system that considers all the aspects of unreliability, working out the Intellectual Management System of “unreliable elements” is needed.

The Article suggests an approach to designing the Human Resources Intellectual Management System in order to increase Human Resources reliability, using the management methods known from the Theory of Management. The Article examines the realization of the Subsystem of implementing management methods by the number of management procedures, executing the corresponding management method.

## The Management System Model

Within the framework of the set task, the Management System is schematically presented on Scheme 1.




*Scheme 1. The Management System Model*

### The Elements of the Model (according to Scheme 1)

The main element of the examined Management System Model are the Management Procedures, their interrelation and functioning provides the definite types of influence on the “unreliable elements” (human resources) in order to achieve the global purpose – increasing the human resources reliability (during their professional tasks solving). Let us examine the Elements of the Model in details:

*Element*: Object of Management

*Description*: the Object, at which the management influence is directed, in order to provide management system functioning; it provides the management tasks fulfillment, which results in achievement of the management purposes.

*Element*: Subject of Management

*Description*: provides the tasks planning, resources distribution, decision-making and control over the achievement of the set purposes.

*Element*: Management Tasks

*Description*: a number of actions that should be performed by the Subject or the Object, directed at achievement of the Management Purposes.

*Element*: Management Purposes

*Description*: Management Purpose is the predetermined state of the Management System.

*Element*: Manifestations of Unreliability

*Description*: a set of attributes of the Subject or the Object of Management, preventing from solving the Management Tasks, and consequently, from achieving the Management Purposes.

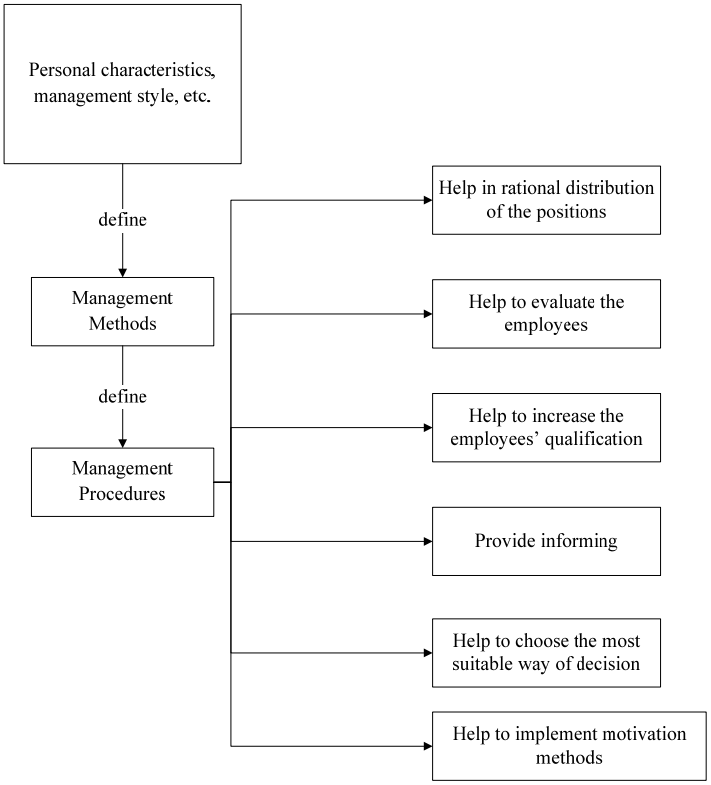
*Element*: Reliability Increasing Methods (Management Methods)

*Description*: Management Method is the definite way (style) of Management, basing on the number of characteristics of the Subject and Object of Management, i.e. it is the function, defined on the tuple set of the values of the Subject and Object of Management. Function range is the set of the finite subsets of the Management Procedures set.

*Element*: Management Procedures

*Description*: Management Procedure is the set of possible actions, directed at the Object or Subject, depending on the state of the Management System, which could prevent the Manifestation of Unreliability or minimize its negative result.

The main actions performed at the expense of Management Procedures, are shown on the Scheme 2.




*Scheme 2. Management Tasks solved by the Management Procedures*

Thus, the Management Procedures represent the management process as the management of the activity according to the following tasks: planning and execution of works; coordination of actions of the specialists,

participating in the task solving; control over the executing the tasks of the professional activity; influence on the executors, etc.

A number of Management Methods is listed in the literature on management. Let us examine some set of the Management Methods:

1. Management Method on the basis of job descriptions requirements. According to job descriptions, the Management System participants' roles are defined, as well as their responsibilities, possibilities, rules of professional tasks solving. The job descriptions requirements, regulating the employees actions in accordance with the defined responsibilities in the collective, are the basis of assigning the human resources for sub-tasks solving.

2. Management Method on the basis of incentive and punitive measures. In order to stimulate the correct fulfillment of the tasks within the short terms, the incentive measures are applied to the Management System participants. In case of tasks non-fulfillment, the punitive measures are applied to the participants.

3. Management Method, in which the interests and psychological peculiarities of the person are considered. To fulfill the task, the Management System chooses such a participant that his interests coincide with the task subject, and his psychological peculiarities maximally meet the task requirements.

4. Management Method, in which the personal participation of employee in decision-making is considered. On the definite stage of work fulfillment, the Management System gives participant the possibility to choose one of the further ways of task solving, provided by the decisions plan. Thus, the participant of the Management System is given the “freedom” of choosing the further task solving, but within the limits of defined decisions plan.

5. Management Method, in which the record keeping and control over the employee is provided. At every stage of task fulfillment, the system arranges the time points of reference, in which the checking of task fulfillment by employee is provided – whether he meets the defined schedule or not. The advancement level charts are made for all participants of the decision.

6. Management Method, in which the informing of the system participants is provided. The Subject is reported about the current state of activities of the Object, the progress of task fulfillment, terms and advancement are reported.

7. Management Method on the basis of development and education. The set of Disciplines is organized in the Management System, each of them corresponds to some rating scale. Each task in the Management System is put in correspondence with the set of minimal rating values for each of the Disciplines. The employee, whose rating values for each of the Disciplines are not less than is required for the task, can be admitted to solving this task.

8. Management Method on the basis of correspondence of the tasks and employees. In the method the history of all employees’ activities is provided according to their performed tasks. When the new tasks appear, the employees who successfully solved the similar tasks in past, are admitted to solve those new tasks.

9. Management Method on the basis of past situations analysis. This method implies keeping all the information on each solved task – the state of the system at the moment of starting the task solving, the method of solving, solving result (successful/non-successful) and the state of the Management System at the moment of completing the task solving. This method helps to avoid the past mistakes and use the successful examples of tasks solving.

Within the framework of designing the Subsystem of Management Procedures usage, the procedures that would be used in the abovementioned methods, are defined.

Procedures set for the method on the basis of job descriptions:

- Roles distribution procedure:

*Description*: This procedure provides the relations installation between the set of human resources and the set of roles, defined in accordance with the job descriptions and the type of the defined task. So, each of the Subjects and Objects of the management is assigned with the set of roles.

*Definition*: (resources, tasks types, job descriptions) → ({} <objects, {} roles>)

Use Environment: Starting of the new task solving, failure in solving the current task (schedule exit, resources problems, re-defining of time terms)

- Positions distribution procedure:

*Description*: This procedure provides the relations installation between the set of human resources and the set of positions, defined in accordance with the job descriptions and the type of the defined task. So, each of the Subjects and Objects of the management is assigned with the set of positions.

*Definition*: (resources, tasks types, job descriptions) → ({} <objects, positions>)

Use Environment: Starting of the new task solving, failure in solving the current task (schedule exit, resources problems, re-defining of time terms)

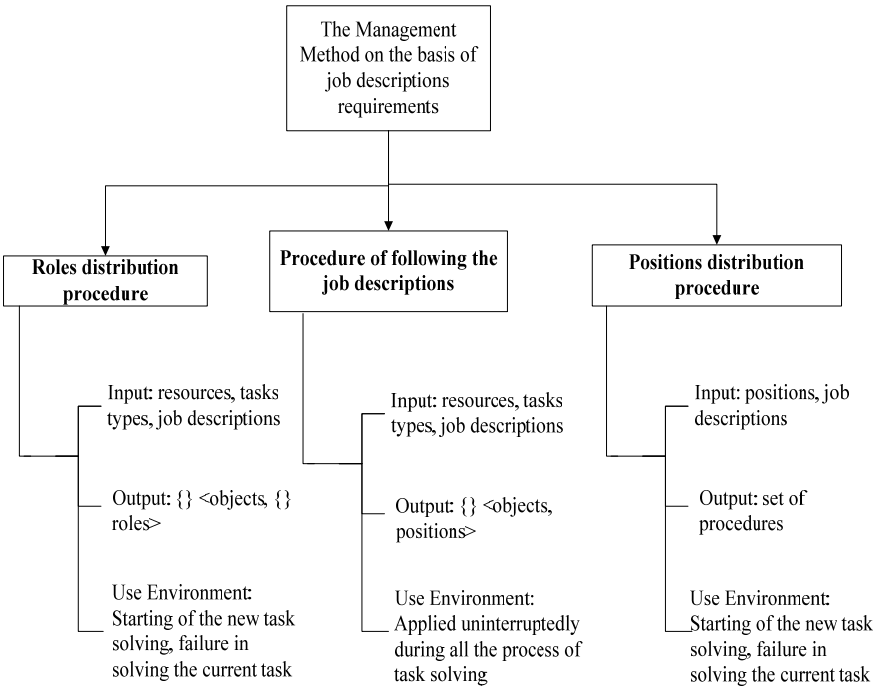
- Procedure of following the job descriptions:

*Description*: This procedure represents the set of management procedures, characterized by the definite set of job descriptions and office position.

*Definition*: (positions, job descriptions) → (set of procedures)

Use Environment: Applied uninterruptedly during all the process of task solving.

Thus, the Management Method on the basis of job descriptions requirements is defined by the procedures set shown on the Scheme 3.




*Scheme 3. The Management Method on the basis of job descriptions requirements*

Procedures set for the method on the basis of incentive and punitive measures.

- Procedure of sanctions definition:

*Description*: This procedure represents defining of relations between the effectiveness of solving the tasks of the given type and executed by the definite volume of resources, and the type of sanction, applied to the task executor.

*Definition*: (tasks types, resources) → ({} <results, sanctions>)

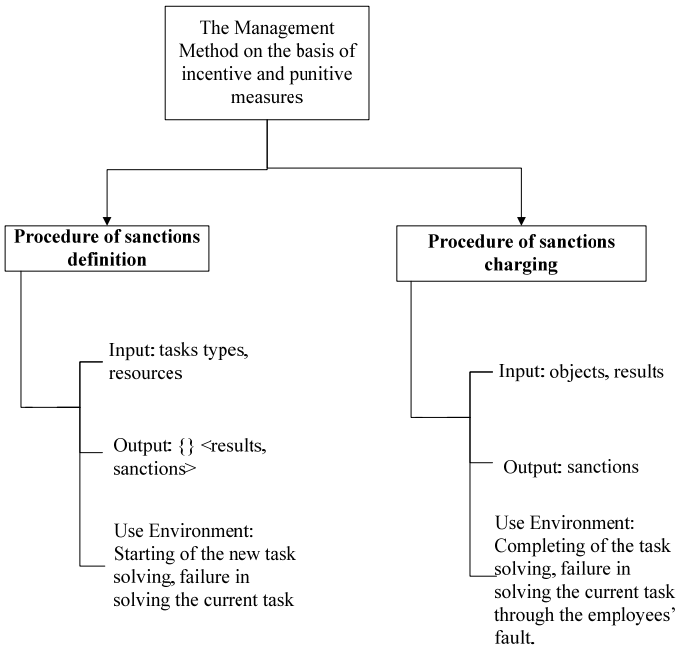
*Use Environment*: Starting of the new task solving, failure in solving the current task (schedule exit, resources problems, re-defining of time terms)

- Procedure of sanctions charging:

*Description*: This procedure provides sanctions charging to the Objects and Subjects of Management.

*Definition*: (objects, results) → (sanctions)

*Use Environment*: Completing of the task solving, failure in solving the current task through the employees' fault.




*Scheme 4. The Management Method on the basis of incentive and punitive measures*

Procedures set for the method, in which the interests and psychological peculiarities of the person are considered:

- Procedure of defining the psychological peculiarities for the tasks:

  *Description*: This procedure sets the relation between the type of the task and position during the task solving, and the set of necessary psychological peculiarities.

  *Definition*: (tasks types, positions) → ({}(psychological peculiarities))

  *Use Environment*: New type of the task or position appearance in the Management System.

- Procedure of appointing to the positions:

  *Description*: This procedure provides appointment of the definite employee with definite set of psychological peculiarities at the corresponding position within the task of defined type.

  *Definition*: (objects, {}psychological peculiarities, tasks types) → (positions)

  *Use Environment*: Starting of the new task solving, change in the psychological peculiarities of employee.

- Procedure of tracking the psychological peculiarities:

  *Description*: This procedure defines the psychological peculiarities of employee according to his behavior history.

  *Definition*: (objects, behavior history) → (<objects, {}psychological peculiarities>)

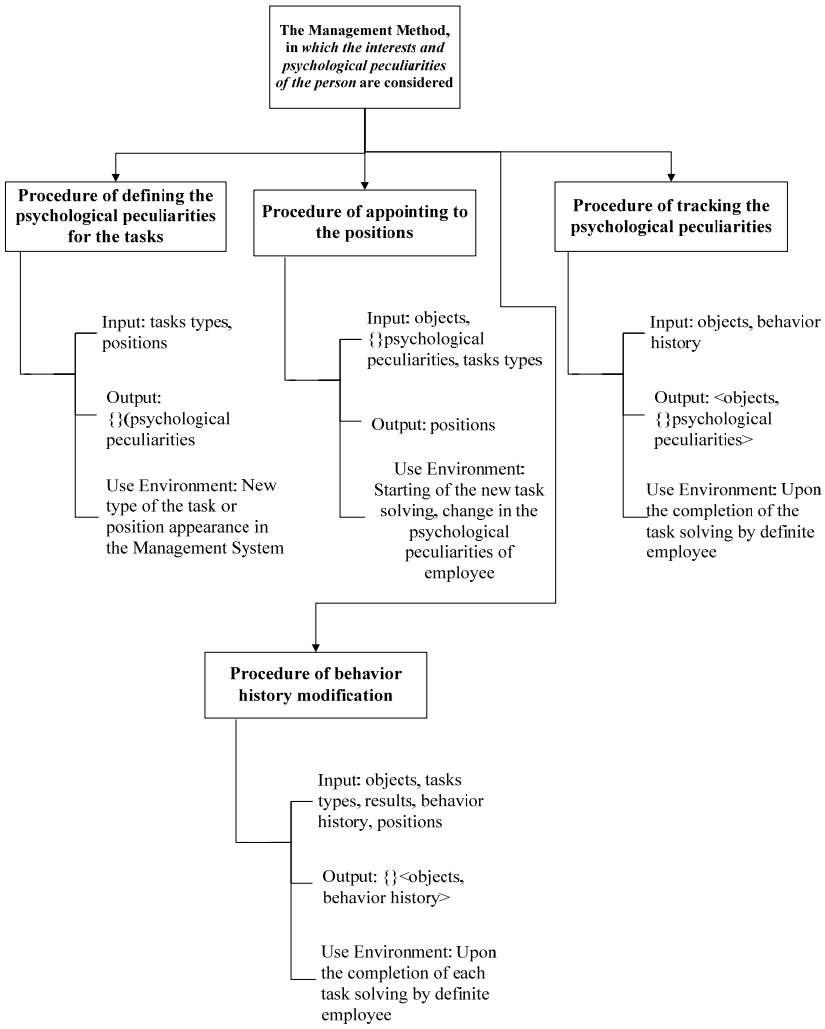
  *Use Environment*: Upon the completion of the task solving by definite employee.

- Procedure of behavior history modification:

  *Description*: This procedure modifies the behavior history of the employee each time upon the completion of his task solving according to the result.

  *Definition*: (objects, tasks types, results, behavior history, positions) → ({}<objects, behavior history>)

  *Use Environment*: Upon the completion of each task solving by definite employee.



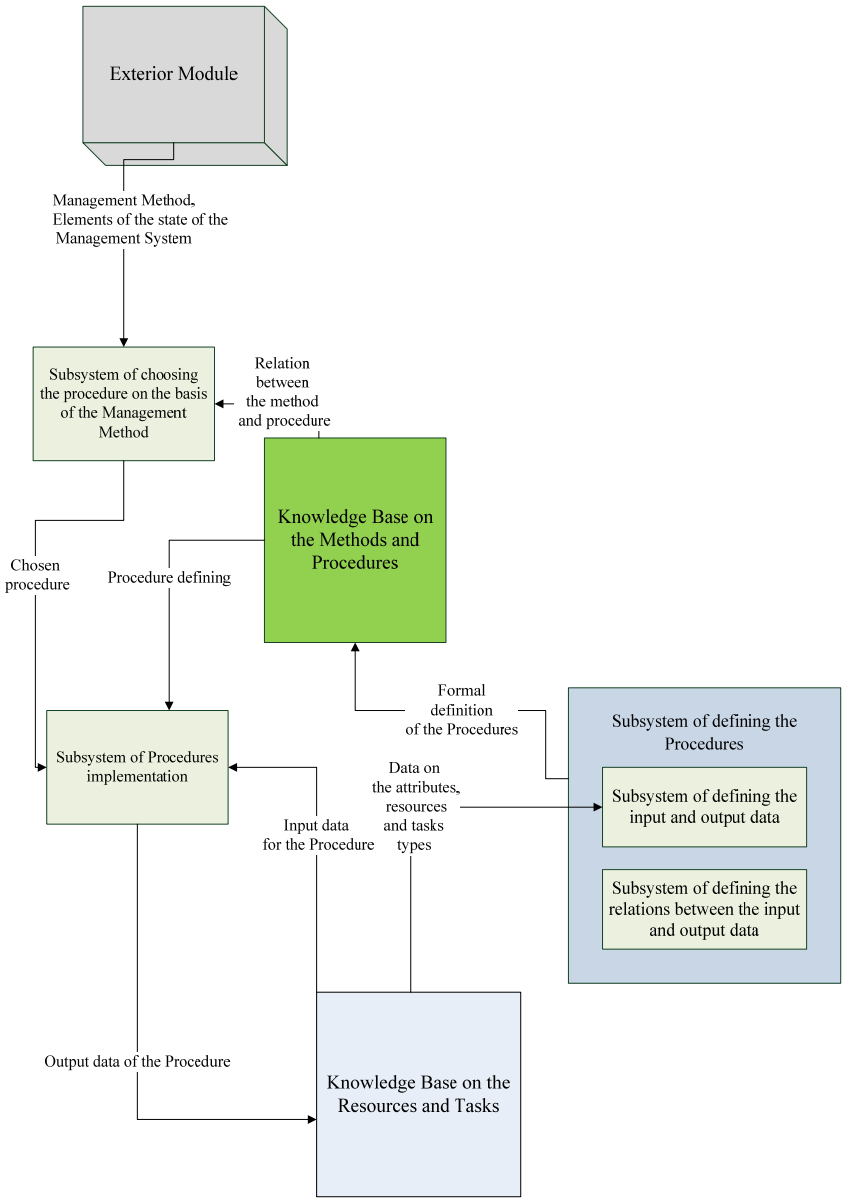

*Scheme 5. The Management Method, in which the interests and psychological peculiarities of the person are considered*

After detailed examination of the Management Methods and the Procedures representing these Methods, within the framework of solving the task of intellectual management of the proposed Implementing Management Methods Subsystem, we can get the generalized model of this Subsystem, providing the widening of the used methods, procedures and their interrelations variety. This model is represented on the Scheme 6.

The development of the Implementing Management Methods Subsystem is carried out within the framework of developing the Unreliable Elements (Human Resources) Intellectual Management System (during their professional tasks solving). Let us examine the Architecture of this System, as is shown on Scheme 7.

## The Elements of Architecture (Scheme 7)

The knowledge on the Unreliable Elements Management, which is put into the System, is represented by the enlargeable knowledge base. Using this knowledge, the System will make intellectual management decisions. Since the resources in the examined Intellectual System are human resources, it is necessary to take into account the human "unreliability" in the System: to formalize the human peculiarities that hamper or block the activity upon the prescribed decisions plan, to define the possible and justified motivation methods to prevent these "blocking' impacts. At the same time it is necessary to consider the peculiarities of each particular "unreliable element". Creation of the Knowledge Bases and data base, shown on Scheme 3, will provide for fulfillment of these management purposes.

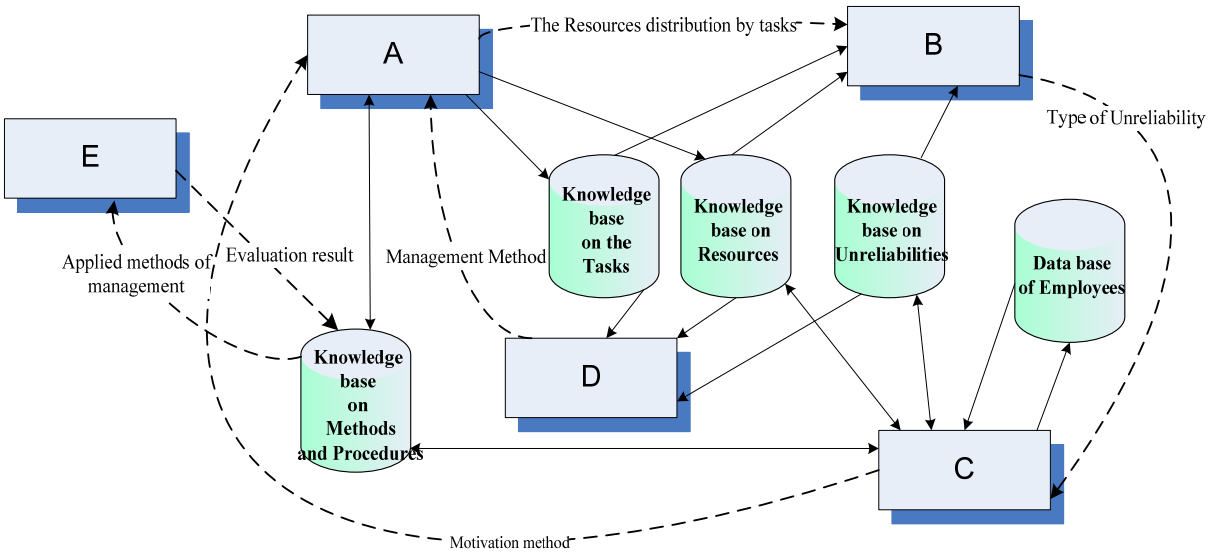



*Scheme 6. General Structure of the Methods and Management Procedures Choosing System*

It is also necessary to define the algorithm, which allows to track the process of the professional activity tasks fulfillment, interfere in the process of the activity and implement the managing procedures necessary for particular case and particular "unreliable element", in order to provide the fulfillment of the decisions plan for professional activity (Subsystem B).

The suggested approach to the Management System designing allows to track the effectiveness of the managing procedures implementation and corresponding human resources reaction to the implemented impacts. Knowledge on effectiveness and human reactions will allow the system to provide self-training in future, thereby improving the possibilities of the System implementation during its further operation (Subsystem E).

Thus, the conclusion could be made, that the functionality, put into the Intellectual Management System, is characterized by the influence (by implementation of particular management event – the number of management procedures) on the "unreliable element" functioning. Such influences may cause the need of the decisions plan revising.




A – Subsystem of procedures implementation on the basis of the chosen methods
B – Subsystem of plan execution and unreliabilities definition monitoring
C – Subsystem of motivation method defining
D – Subsystem of managing method defining
E – Subsystem of implemented managing methods effectiveness evaluation

*Scheme 7. The Unreliable Elements Management System (during their professional tasks solving)*

## Conclusion

The Article suggests the author's view on the approach of the automatized Intellectual Management of people's activity, considering the mechanisms of influencing the human resources as the "Unreliable Element" within the Management System. The Article suggests the approach to development of the Management Procedures Implementation Model on the basis of the chosen method within the Unreliable Elements Management System.

The main components of the Model are defined. Also touched upon are the questions of System Architecture, which can provide the control over the tasks fulfillment and increase the effectiveness of professional tasks execution by the people, using the Management Procedures.

The suggested approach allows to create the intellectual programmed instrument which would, unlike the already existing programmed management systems, cover all the characteristics and abilities of the human resources and will increase human resources reliability during their professional tasks solving.

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## Authors' Information

*Roman Benger, Elena Antonova – Far East State University, Institute of Mathematics and Computer Sciences, P.O. Box: 690002, Okeanskiy avenue, 99 - 136, Russia, Vladivostok; e-mail: stainberg@mail.ru*