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Designing an automated decision support system for energy management system of educational institutions

Determining the causes and sources of losses in the accounting and energy consumption is the basis for making management decisions and construction of power management and energy efficiency measures.

Introduction. To generate data management system is necessary to minimize the impact of human factors on the objectivity of the information received and evaluating actual results. This is achieved by using additional technical means reliable measurement parameters and primary energy flows (in terms of top-level management) data within the automated system integrating energy (ASKOER).

Problem of the research. The purpose of automating energy management system is to improve power management. The main objectives for the development and implementation of energy efficiency and its automation is: the current state of research in the field of consumption; develop the concept of power management; design and creation of the automated system power management; testing systems in all regions of Ukraine; formation of organizational and methodological conditions for implementing the system power management.

To develop mechanisms for automated building energy management system (ASEM) was chosen object-oriented approach, as it allows for a powerful means of expression object and object-oriented programming using blocks as classes and objects as in the object model is reflected and many other factors. Objective approach is unified whole idea of computer science, applied not only in programming but also in designing user interfaces, databases and even architecture computers. Therefore, the use of object-oriented approach to system design simplifies its software implementation. Targeting objects allows systems to cope with the complexity of diverse nature. In object-oriented analysis classification or definition of common object properties, helps find common key abstractions and mechanisms which, in turn, results in a simpler system architecture. When designing an automated decision support system for energy management system used common notation (UML standard).

In the first stage carry out development diagram precedents. The diagram shows three actors (Actor): system administrator, accountant and energy manager and a list of executable This diagram allows you to create a list of operations that performs system. So with (Figure 1) shows that the system administrator performs basic tasks, also shows that the operation as a "system administration" is mainly because it is related to many problems even are attached to other actors.

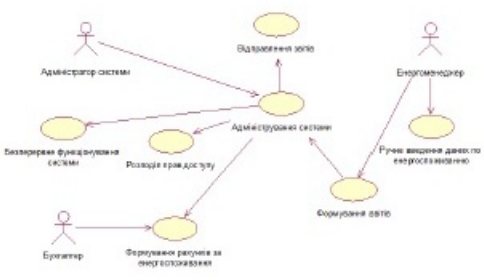

Fig.1. The diagram of precedents

The next step in designing an automated decision support system is to develop a class diagram that will serve in the future for database design and functions linking classes (Fig. 2) and objects automated system. Class diagram is a set of static declarative model elements. These charts can be used both in direct and design at the back. This diagram this is the end result of the design and development process starting point.

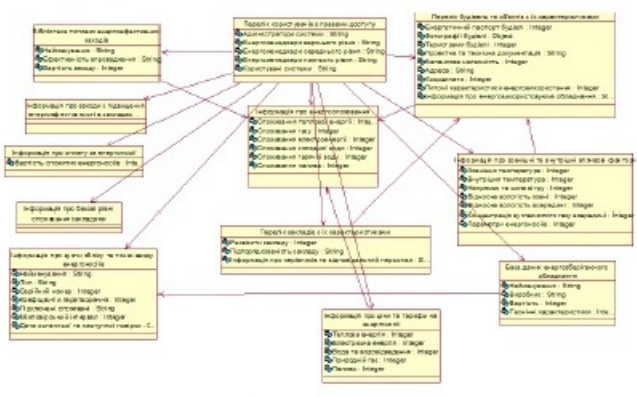

Fig. 2. The diagram of classes

The next step will create cooperatives diagram (Fig. 3). Cooperative charts allow you to spatially locate objects. Unlike sequence diagrams, charts on cooperative instances of objects are displayed as icons. The chart only shows objects that are directly or indirectly involved in the implementation of this use case. As well as the diagram sequence, a line with an arrow on the end means the messages exchanged performed within this use case. Their temporal sequence, however, indicated by numbering messages. Line arrow is made about a line connecting objects and points in the direction of the object to which the message is sent.

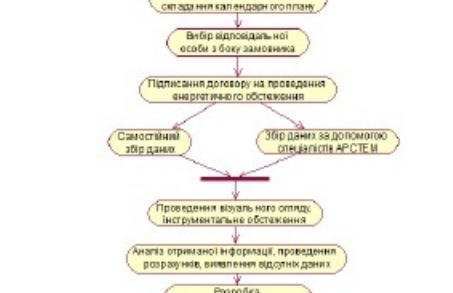

Fig. 3. The diagram of cooperations

Next step is create a diagram of states. In this diagram objects characterized by behavior and state where located. State of the object is determined by the values of some of its attributes and relationships with other objects. Diagram shows how the object moves from one state to another and serves to model the dynamic aspects of the system. Example state diagram shown in Fig. 4.

Fig. 4. The diagram of state

Create a chart activity. In this chart shows the decomposition of some of its components. Here, the activity is meant specificity behavior performed in a consistent and coordinated implementation of parallel subordinate elements interconnected streams, which are outputs from one node to the other inputs.

In (Fig. 5) shows a diagram of energy activity.

Energy can be broadly divided into three stages:

1. Preparatory, you provide information about the facility inspected by completing a questionnaire or contacting experts love energy. After agreeing on the cost, timing and scope of work agreement is signed;

2. Direct Energy, begins immediately after signing the contract and characterized by obtaining data on the grids by collecting available information and carrying out instrumental examinations. Further to the analysis of the data developed specific energy efficiency measures;

3. Final: combines the results of the entire survey: Energy passport; energy saving program which includes specific measures for evaluation of their economic efficiency by which you can reduce the cost of fuel and energy resources and, therefore, reduce production costs and increase its competitiveness in the market report of examination and presentation of all its customers.

Fig. 5. The diagram of activity

To address energy conservation management should review their cash flow and begin to invest funds in the development and upgrading of production.

Scientific and technological progress reduces the problems that exist in the industry. Modern microprocessor technology allows to analyze the operation of

power equipment and networks in real time, analyze and predict energy consumption accordingly. This to them is not clearly regulated by algorithm analysis and decision making for the implementation of the goals and objectives of energy saving in the industry.

The chart shows the activity (Fig. 6) of a systematic approach to process management based on energy conservation monitoring and planning.

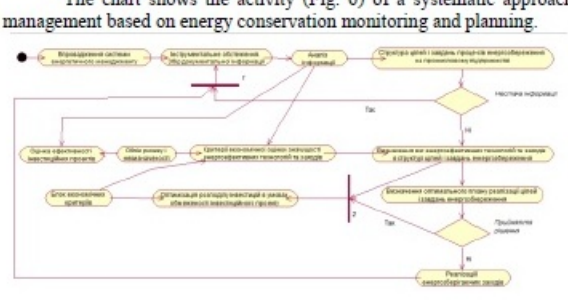

Fig. 6.The detailed diagram of activities (systematic approach to process management based on energy conservation monitoring and planning)

Developed chart covers the basic problem of lack of energy saving and — incorrect analysis of information on energy savings in the industry. And if business is not enough funds to organize energy management system, the solution of these issues must be put on energy enterprises, as now, most companies have only service chief power, which deals mainly with routine operation of a reliable energy economies.

Conclusion. Thus demonstrated a possible approach to modeling energy management information system of the institution, based on the use of Unified Modeling Language (Unified Modeling Language) (UML), and harmoniously combines the benefits of structural and object design methods in CASE Rational Rose. A 7 diagrams (precedents, class, order, cooperatives, state, activity, scan) specifically for a given task - namely, automated information system integrating energy.

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