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IMPROVING INFORMED MODEL PRESENTATION AND MODELING SEQUENCE

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ABOUT ARTICLE

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Abstract: This article describes the parameters and variables important to the object, the relationships between them, the information that describes the input and output of the object, and the variable model that provides complete information about the object's possible It is about an informative model that fully classifies the process of modeling the states of.

INTRODUCTION

Today, modeling in scientific research began to be used in ancient times and gradually covered all new areas of scientific knowledge: technical design, construction and architecture, astronomy, physics, chemistry, biology, and finally, social sciences. The 20th century brought great success and recognition to the modeling method in almost all areas of modern science. However, modeling methodology has long been developed independently of each other by individual disciplines. There was no single system of concepts, single terminology. Gradually, the role of modeling as a universal method of scientific knowledge began to be realized.

The term "model" is widely used in various fields of human activity and has many semantic meanings. In this section, we only consider such models as tools for learning.

The word "model" is derived from the Latin word "modulus", which means "measure", "pattern". Its original meaning had to do with the art of construction, and in almost all European languages it was used to denote an image or prototype or something similar.

Thus, a model is a simplified representation of a real object, process or phenomenon. A model is such a material or mentally represented object that direct study of the original object in the research process provides new knowledge about the original object.

Simulation is understood as the process of building, learning and applying models. It is closely related to such categories as abstraction, analogy, hypothesis, etc. The modeling process, of course, includes the construction of abstractions, conclusions by analogy, and scientific hypotheses. Modeling is the construction of models for the study and study of objects, processes, events.

Object models should reflect what actually exists. Therefore, object models are often understood as abstract generalizations of real-life objects. For example, object models can be copies of architectural structures, the solar system, the structure of the country's parliamentary power, and others. A model can describe animate and inanimate natural phenomena, not just one, but a whole class of phenomena with common characteristics. Models of objects or phenomena reflect their original properties - their properties, parameters.

You can also create process models, i.e. modeling of movements in material objects: course, sequential change of states, stages of development of an object or their system. Examples of this are well known: these are models of economic or ecological processes, the development of the universe or society, etc.

MATERIALS AND METHODS

Modeling theory is based on a systematic approach. The systematic approach is that the researcher does not focus on individual parts of the system, but tries to study the behavior of the whole system. This approach is based on the recognition that even if each element or subsystem has optimal design or functional characteristics, the result of the whole system may be suboptimal due to the interaction between its individual parts.

A certain set of elements of the considered system can be represented as its subsystem. Subsystems are believed to include some parts of a system that function independently. Therefore, in order to simplify the research process, it is first necessary to correctly identify the subsystems of a complex system, that is, to determine its structure. System structure is a set of relationships between its components (subsystems) that are stable over time. And with a systematic approach, an important step is to determine the structure of the studied, described system.

When working with a computer as a tool, one should not forget that it works with information. Therefore, it is necessary to determine what information and in what form the computer can perceive and process. A modern computer is capable of working with sound, video, animation, text, diagrams, tables, and more. However, the use of various data requires technical (hardware) and software (software) support. Both are computer modeling tools. Now there are a wide range of programs that allow you to create all kinds of computer iconic models: word processors, formula editors, spreadsheets, database management systems, professional design systems and various programming environments[4-7].

Modern computers provide wide opportunities for modeling various events and processes. In the educational process, the computer should not replace the blackboard, poster, film and slide projector, natural experience. Such a replacement is desirable only if the use of computers provides a significant additional effect compared to the use of other educational tools.

Computer simulation is a promising way to improve the educational process. It is gaining more and more importance in modern scientific knowledge and, in addition, it is currently becoming a popular didactic tool. Let's take a closer look at this direction.

When working with information models or building it, it is not necessary to break the sequence of execution, they do not have a material representation, because they are built only on data. In fact, an information model is a set of data that describes the important features and conditions of an object, process, event, as well as its relationship with the environment. Therefore, we define an informative model as follows:

An information model is a formal model of a limited set of facts, concepts, or instructions designed to meet a specific requirement.

To build an information model, it is necessary to go through several stages. The process from the "object of knowledge" to the "formal construction" is called "formalization", and the reverse process - "interpretation" - is often used in environmental knowledge and learning.

Information modeling is based on three postulates:

1. everything consists of elements;
2. elements have properties;
3. elements are related to each other.

These postulates can be represented by the applied object information model.

Information model. When formulating the goal of modeling, the question arises about the correctness and completeness of creating a list of qualities and features of the future model. The description of a modeling object is often called the term "information model". Examples of its use can be seen in various forms: graphic, verbal, tabular, mathematical, etc. The more accurate the information model, the more qualitatively and fully it reflects the set of properties of the original object. Therefore, it is only necessary to select the most necessary parameters for modeling and establish a relationship between them. This process is called system analysis.

Presentation form. One of the features of the information model is its presentation form, which is closely related to the purpose of image creation. If one of the requirements for the project is its appearance, then a graphic information model is used. It is not difficult to find examples of this: electrical circuits, maps of the area, various graphs and drawings. In addition, the same information, for example, a graph of temperature changes for a month, can be presented in different forms, for example, in the form of a table or text [1-3].

When an information model is formed, its parameters can be used to study a real object, predict its behavior in various conditions, and perform calculations. Often mixed information models are used. Examples of the use of this form of modeling can often be found in construction, where the individual characteristics of a complex object, for example, a building, are formed and reflected in the form of drawings, mathematical calculations of strength and permissible loads.

Another vivid example of a mixed information model is a geographic map with topographic symbols, records, and tables. Such a model can also be presented in the form of graphs, charts, tables, diagrams. The latter is conditionally divided into maps, schemes and graphs.

Classification. For the convenience of working with information models, they are conditionally divided into several large blocks: by the field of use, the time factor, the field of knowledge and the form of presentation. They can also be divided according to the type of construction (tabular, hierarchical and network), according to the form of data representation (symbolic and pictorial-symbolic) and according to the object (describing the characteristics of an object or process).

Various photos, drawings, graphics can be included in this type of models. Examples of the virtual information model are often found in educational institutions, where posters present a lot of information in graphic form. Another way to use it is pictures from any school textbook, for example, a diagram of the formation of troops in the Battle of Stalingrad. Examples of visual information model can also be seen in scientific organizations where objects are separated according to their external characteristics.

Mathematical models. Mathematical modeling allows the use of mathematical symbols and relationships to describe an ongoing process.

A mathematical model is a set of mathematical objects and relationships between them that adequately reflect the properties and behavior of the object being studied. A model is considered adequate if it reflects the studied characteristics with acceptable accuracy. Accuracy is assessed by the degree to which the values of the output parameters predicted during computational experiments in the model match their actual values [12-13].

A mathematical model covers a class of unspecified (abstract, symbolic) mathematical objects, such as numbers or vectors, and the relationships between these objects.

A mathematical relation is a hypothetical rule relating two or more symbolic objects. Many relationships can be described using mathematical operations that relate one or more objects to another object or to a set of objects (the result of an operation).

A mathematical model reproduces well-chosen aspects of a physical state if a correspondence rule can be established that relates specific physical objects and relationships to specific mathematical objects and relationships. Creating mathematical models that have no equivalent in the physical world can also be instructive and/or interesting. The most well-known mathematical models are integer and real number systems and Euclidean geometry; the defining features of these models are more or less direct abstractions of physical processes (calculation, ordering, comparison, measurement).

The objects and operations of more general mathematical models are often associated with a set of real numbers that can be associated with the results of physical measurements.

Numbers, variables, sets, vectors, matrices, etc. act as mathematical objects.

Classification of mathematical models based on the characteristics of practical mathematical apparatus.

Homework Check Give different examples of graphical information models. Give different examples of graphical information models.

A meaningful statement of the problem Tennis players use machines to throw the ball to a certain place on the court during training. It is necessary to set the desired speed and angle of throwing the ball to the machine in order to hit a field of a certain size located at a certain distance [8-11].

A qualitative descriptive model is that the ball is small compared to the earth, so it can be considered a material point; the ball is small compared to the Earth, so it can be considered a material point; the change in the height of the ball is small, so the acceleration of free fall can be considered as a constant value g=9.8 m/s 2 and the movement along the Y axis is uniformly accelerated; the change in the height of the ball is small, so the acceleration of free fall can be considered as a constant value g=9.8 m/s 2 and the movement along the Y axis is uniformly accelerated; the acceleration of the body is small, so the air resistance can be neglected and the movement along the X-axis can be assumed to be uniform. the acceleration of the body is small, so the air resistance can be neglected and the movement along the X-axis can be assumed to be uniform.

Mathematical model x = v0 cosa t y = v 0 sina t – g t 2 /2 v0 sina t – g t 2 /2 = 0 t (v0 sina – g t/2) = 0 v0 sina – g t/2 = 0 t = (2 v0) sina)/g x = (v0 cosa 2 v 0 sina)/g = (v0 2 sin2a)/g S x S+ L - "hit" If x S + L, it means "fly" means

Pascal language computer model Pascal language computer model s1 program; uses graphics; (graphics module connection) uses graphics; (graphics module connection) var g, V0, A, t: real; var g, V0, A, t: real; gr, gm, S, L, x, i, y: integer; gr, gm, S, L, x, i, y: integer;

Turbo Pascal computer model Turbo Pascal computer model begin g:=9.8; g:=9.8; readln(v0, a, S, L); gr:=detection; initgraph(gr,gm,""); (call procedure GRAPH) line(0,200,600,200);(draw x-axis) line(0,0,0,600); (draw y axis) setcolor(3);(set blue) line(S*10,200) ,(S+L) *10,200);(draw area)

Turbo Pascal computer model Turbo Pascal computer model x:=round(v0*v0*sin(2*a*3.14/180)/g); if x is S+L outtextxy (500,100, "perelet") else outtextxy(500,100, "popal"); (record flight result) readln; closeness; finish

An information model that clearly explains many processes that are difficult to understand in examples also obeys the basic requirements of modeling.

RESULT AND DISCUSSION

Models can be static or dynamic. Properties of the object in a certain time interval describe static information models. Examples of their use can be found in the construction of a house, taking into account its strength and resistance to static load. Or in dentistry, in the current appointment of the condition of the patient's oral cavity: the number of fillings, the presence of defects, etc.

If we consider the dynamics of changes in the patient's condition over several visits or over several years, then a dynamic model is used to describe the same characteristics.

Examples of dynamic information models are found when dealing with factors or characteristics that change over time. Among them are changes in temperature, seismic vibrations and others.

Information models also include verbal models presented in spoken or mental form. They are also called "verbal information models". Examples of such modeling can be observed when driving a car: the situation on the road, traffic lights, the speed of neighboring cars, etc. are analyzed by a person. In this case, a specific behavior model is developed. If the current situation is correctly modeled, then this part of the road will be safe. Otherwise, there is a high chance of an accident

Verbal models also include a poem that has passed through the mind of a poet or an image of a landscape that has not yet been put on canvas in the eyes of an artist.

The verbal type also includes a descriptive information model, which consists of a written or oral description of an object using language. An example of a visual information model: prose in fiction books, descriptions in fiction, textual depiction of events and objects.

A mathematical information model can be considered as a symbol variant. Its peculiarity is that the characteristics, parameters or processes are represented by mathematical formulas. Also, this view describes the relationship between the quantitative characteristics of objects. For example, knowing the mass of an object, we can calculate its free fall speed for a certain minute. In this case, information objects are usually presented in a mathematical form.

Thus, we came to the following conclusion: models that are similar to real objects or processes should not reflect all the features of the originals, but should reflect only the features that are more required for their use in a given situation. There is no need to show the entire variety of properties of the object - this can lead to the complexity of the model and the inconvenience of its use. Therefore, it is very important to understand for what purpose the model was created, what parameters should be reflected in this specific case.

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