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Nowadays, grace of computing possibilities that electronic computers offer and namely, big memory volume and computing speed, there is the improving of modeling methods, an important role having complex system modeling using simulation techniques. These offer us information about the system before it to be correctly realized through building of mathematical and logical models which describe real system behavior or the behavior of some parts of it during long time.
In this work we purpose to analyze the main kinds of testing and validation of simulation model, starting from that to a simulation program it can assign the character of model only when its trustiness is checked and practically proved because only relying on the results of such models, decisions can be taken, these results being those which correctly represent studied system.

Key words: simulation model, validation, sensitivity analysis

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1.PROCESS OF PASSING FROM REAL SYSTEM TO THE MODEL OF SIMULATION

The knowledge of evolution rules of complex systems, making a link between quantity-quality analysis and formalized representation of processes and phenomena demand application of modeling method for decision act.
The model made basing on the checking of available information about feature, behavior and functionality of a system is an active part of information resource for optimize the activity.
On the base of making every model, is mainly the exigency of its conception so to reflect simply and clearer and clearer the reality that it follow to show
Nowadays, grace of computing possibilities that electronic computers offer and namely, big memory volume and computing speed, there is the improving of modeling methods, an important role having complex system modeling using simulation techniques.
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By the means of simulation, 'inputs" are generated and considering system internal states, through right algorithms, the "outputs" are established and there is shown the evolution in time of the system [1].
However simulation gives under-optimal solutions, it is an efficient technique for studying complex problems at firm level.
In simulation activity, three important elements are implied and namely: real system, the model, the computer and two relations: modeling and simulation relations. It needs the following considerations:

"real system" is the system observed using human feelings;

"real model" is the replaced real system and that generally correspond to the demands of initial real system;

"abstract model" makes the passing from "real system" to "real model". It remakes real system through system decomposition in basic parts and establishes the links between them [9].

Validation of results is made through a checking of the correspondence between the data from real system and those given by model.
Simulation allows the description of complex system behavior and makes possible experimentation of a system without expose the organization to the dangers of real world.
Simulation model, with its many characteristics, is the link between economic-mathematic model that has the possibility of modeling and reality. Searching thoroughly possible changes in real world through simulation model, we can often learn how to improve existing behavior without applying in fact the good or bad ideas about the system. In a simulation model it is possible the compression of long whiles in seconds at computer [3].

Simulation models are in most cases parts of informatic systems relied on solving system problems based on solving conversational system problems. They are used together with informational management and decision system.

2.DIFFICULTIES AND TYPES OF VALIDATION

It should be ideal that simulation model to be compared directly to the system which represents but this thing is not always possibly because the comparison is made between two "sets" of observations.
In the best case, the analysis put in evidence features equal to those of "real" system and can be considered correct if it is not negated by certain hypotheses.
In consequence, a simulation model has no universal validity but can be valid for reaching a certain target and within certain hypothesis.

Black Box Validation

For analyze the kind of model operating compared to real system these are supposed to be 'black boxes". In consequence, operating data are unknown.
Test method of the kind 'black box" is simply. The behavior of real system is viewed in certain conditions and after that, the model is put in operation in similar conditions. If the model is valid, observations about it wouldn't have to differ from those of "real" system.
The comparison of the two sets of observations is made by the means of statistic methods, there are called checking tests for some hypotheses and test trustiness is explained through likelihood index.
Validation errors which can occur are errors of level 1, when a correct hypothesis is wrongly rejected. II-level errors appear when false hypothesis is accepted as true. Zero-type errors are very severe because who makes the test follows a series of useless aspects – it results a wrong model, ultra-sophisticated [7].
The model is statistically considered as valid but it proves to be useless because it responds to not important problems. This approaching can be made for the whole model or for a part of it.

White Box Validation

In this case, it is supposed that simulation model and "real" system are transparent. Internal features are very well known and understood. Validation of this kind is useful in model building process, nowise in final phase.
While in validation case of type "black box" prediction power of model is stressed, in "white box" validation, the accent is on internal activities of the model.
The most of simulation include a static logic which shapes system behavior. In a discrete simulation these are rules of the kind *if* (conditions) – *then* (action). Thus, real system can be controlled. In a continuous simulation, there is more probably to be rules which control system behavior in extreme conditions. If simulation has been base on statistical rule of system behavior it wouldn't be longer useful because simulation is used to mirror the system's dynamic behavior. In fact, dynamic performance (of action) of the model during running must be validated [8].
The materials (support), the animation (dynamic exposure of model features) are integrated in simulation program. System variables and states can be observed while the programs run, so the errors in action logic can be found.
As how it is possible, ultra-sophistication of the model which harms in a dynamic approaching must be avoided because a lot of changes appear in system wherefore the model must answer favorably.
Ultra-simplification is another extreme case that must be avoided, because it doesn't pass to surprise important aspects, useful details.
Zero errors avoidance can be realized either through the fast establishing of the target purposed through the model or through the adoption of a kind of approaching explicit and evolutive for the model.

3.SIMULATION MODEL TESTING AND CHECKING

We assign to simulation program the character of model only when its trustiness is validated and practically proved. Because only relying on the results of such models it can take decisions, they are those which correctly represent studied system.
In the case of a wrong structured problem, a wrong computer program can be made or baffling results can be reached. Hence there is useful model checking through testing step by step.
There are two components and namely: checking (refers to the rightness of process building, of model programming) and validation itself (refers to concept checking, there are checked the component parts and the relations between them).
Narrow linked to model validity is its sensitivity to outside influences. From the study it results the way of configuration the same time with the ease of model feature.
For checking right making of model, there were developed a series of software-engineering methods that find and remove programming mistakes (structured programming, top-down programming, Program-design).
Relevant especially for simulation programs, "trace" method is known which consists of the showing of event effects over corresponding status changes. Presentation of key-messages and message of pointing error causes in

the case of some procedures or methods „a structured walk through" used in team working case (every command is jointly explained and checked).
Generally, it considers that in every growth of complexity, the model is tested again. For program codes checking there are recommended methods of viewing them. Because the importance of validation, in the followings we'll show some characteristics of it.
The validation is characteristic to every model. Depending on the problematic of each studied model, there are established the specific validation criteria for deliver a real results. Validation is a gradual category. In the case of a decision of the kind "either-or", the model is considered valid only how it reaches real problem core. In certain cases, the growth of model validity can be realized only using very big costs. In these sense there was established a function of the relation between edge value of information and edge cost in the case of the increasing of model validity degree. [9]
Validation is the result of a negotiation process. A model is useful when beneficiary believes in its validity. As negotiation process, validity can be viewed considering used validation criteria and methods.
Practically, this thing is realized as collaboration between implied parts filled in by analytical and methodological competencies of expert consultants and with beneficiary's experience.
Validation acts during running of the whole project. It is considered even in the phase of element definition till model concept framing and model experimentation. Project phases occur interactively.
In dedicated literature [6] evaluation methods are grouped according to certain criteria. For user there are important: functional validity (checks model acceptability, reaction degree of simulated model, model behavior), result validation (gained results are compared and there is analyzed how they are near to reality and/or they improve real system) and theoretical validation (validation of simulation results through comparison to theoretical results computed using other methods).

4.SENSITIVITY ANALYSIS FOR A SIMULATION MODEL

Sensitivity analysis allows experimentation of models for follow system reaction under conditions of controlled variation of external parameters or of internal processes from system.
There is not the subject of simulated system validation but of generation scenarios of results running and evolution.
There are established possible limits of overrunning results and also of deviation and dispersion of these results. For this reason, sensitivity analysis is considered to be an analysis of kind "what-if", "what happens if…". For this, there is built a system of values intervals relied on forecasting efficiency computes [10].
Sensitivity analysis is used especially when input data are not valid, when repartition of input data is subjectively established, when information about inputs are related, when they can be given only fuzzy hypotheses about system relations especially in cause-effect relation.
In all these cases there are so-called "critical points" which strongly lead to the emission of alternative premises and the result is got as scenario [11].
The scenario will be so built that to be also considered occasional influences wherewith the system could fight in the future.
The capacity to fast and efficiently test the most interesting combinations offered by this scenario, also supposes real collaboration with system beneficiary.

CONCLUSIONS

Validation process and sensitivity analysis have an important role in the foundation of easing a simulation model. It can be cancelled a series of features and relations that have minor influences over the model and also the description of the states of the system having too big number of variables.
As a consequence of complexity reduction, the effects are turned into simulation costs decreasing, a smaller volume of input data, decreasing of the expenses of model implementation, easy interpretation.
Complexity decreasing for a model is possibly only as how the reality allows this thing. But there are a series of simplification principles of a model possibly to be applied and namely:

When input values repartition is a repartition function of empirical values, there is checked the existence of a family of repartition functions that could lead to a better approximation (thing possible to be realized through a sensitivity analysis);

The parameters which have small variations during simulation can be considered as constants;

The size which equally troubles all the alternatives can be cancelled.

All the relation that can be represented through mathematical functions will be included into the model;

Sensitivity analysis can be used for building the possible combinations between input and output values of for evaluation the consequences of doubt premises;

For models having hierarchy structure, there are especially validated the models having easier feature, then it also follows an extension over those more sophisticated.

It results that the heaviness of testing process refers to the model wherein we understand and dimension the reality, because economic-mathematic model or simulation one, is the creation of an analyst by whose means it represents in a kind or other, a certain system.

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