

## Theoretical Base of the Building to Models of Management in Construction

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### ABSTRACT

Given work is dedicated to study theoretical bases development of the method, which will allow to build the process of searching for of the optimum management decisions, based on formalizations and automations deductive conclusion with reference to management such complex system as construction.

The Base of this method are semiotic modeling, i.e. a logician-linguistically approach of searching for of the decisions on management. The Construction (S) presents itself collection technical (T), social (C) and economic (E) of the systems, As a result such complex approach to production given problems is found algorithm of the building to management model to building organization with use logician-analytical methods of the quantitative analysis.

The Article is dedicated to development to models of construction management, as bases of the maintenance of the normal move production provided that it is provided periodicity and stability, the further development production with provision for use technical and technological innovation that will allow to raise the quality to product construction.

### INTRODUCTION

The Model of management necessary to on the base computer technology to conduct the analysis of the working the real system, but then with provision for revealed particularities to carry on real situation. The Technology of management in construction, either as in any management, is based on theories to feedback, providing required currents of the processes in construction.

The Construction, in the most broad sense of the word - a type to human activity, directed on target change or adjustment surrounding ambiances for their own necessities, in this instance - a making the buildings, engineering buildings, as well as accompanying him object.

The System - a composition, or unity, built on relations  $r$  ensemble of the relations  $\{R\}$  and limiting these relations condition  $z$  ensemble  $\{Z\}$  from primary element  $m$  ensemble  $\{M\}$ , chosen on bases an ensemble of the bases  $\{A\}$  from универсума  $U$ . At ensemble and as apart, so and together, can be empty or contain the endless number alike or different element.

Industrial technology building production comprises of itself execution following type work: transport, cargo-handling, earth, bore and blasting, pile, stone, insulating, concrete and железобетонных, erection, roofing and so. Work are conducted, both in usual condition, and with provision for particularities in winter condition, in region of the permafrost, as well as in region with hot climate with provision for particularities of the local landscape and

earthquake of the region.

Management complex and multifunctional system, as construction, expects presence of the knowledge and given about condition of the object of management. The Knowledgebase presents itself collection of information on all components and influence on move technological process construction, which order of the execution is specified determined rule and instruction. On base of the analysis to information are worked out management decisions on translation of the process in new, beforehand determined condition. Since construction is weakly outline and bad formalized object, that give the methods to its formalizations with provision for all real conditions does not introduce possible so logician-linguistically model is built with provision for the most essential factor only. Necessary to note that at decision given problems happens to face the different type of the uncertainties such as inexactness notions, incompleteness to information, inexactness, sometimes and contradiction in available information that obstructs the development to general methodology of construction management. So in given to work while they were limited only the most essential factor, allowing formalize the management interactions.

With provision for foregoing essence of management (*M*) is reduced to the following: collection, keeping, processing and issue to information (*I*); the development and taking the management decisions (*D*); the production controlling influence and issue their object management (*P*), checking the performance of the taken decisions (*C*), account external and internal factor of the hindrances (*A*), and production correcting action (*Pr*). This possible represent the following formula:

$$M = I + D + P + C + A + Pr.$$

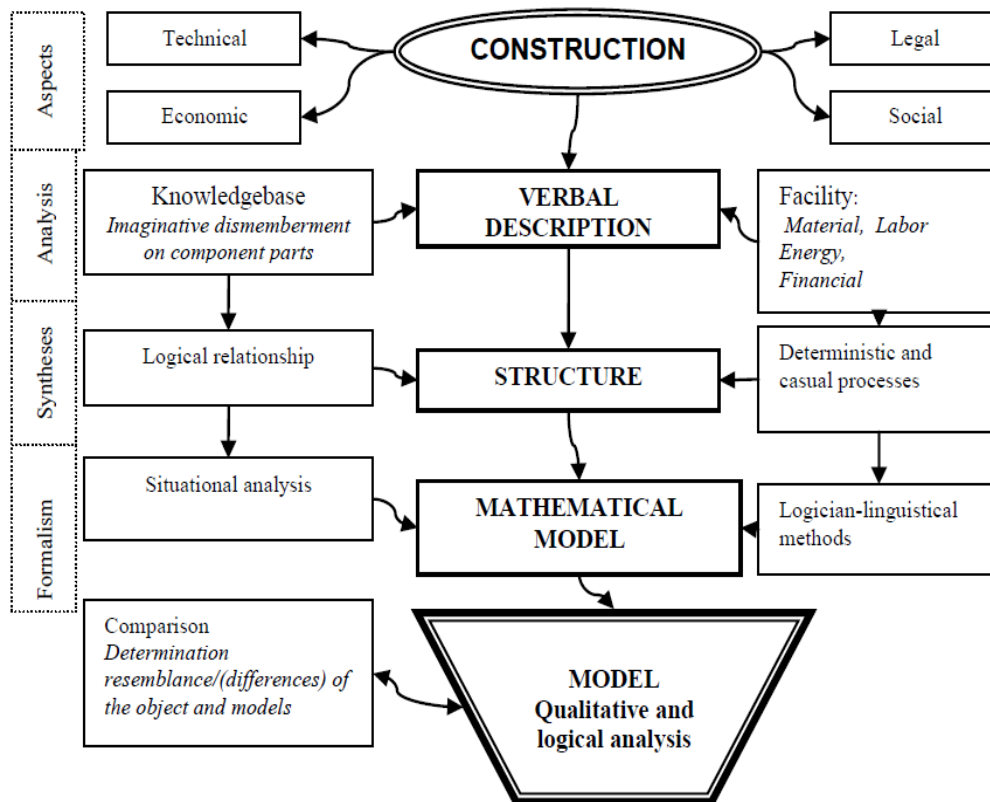
Process to automations of searching for of the decisions when governing complex system requires consideration of the following questions: presentation of the knowledge about object of management, description situation, deductive conclusion [2].

Management complex object in principal without attraction of information impossible, which can not be denominated quantitative. This semantic, i. e. semantic, qualitative information. The Circumstance spurred specialist in the field of management to begin work on study of the models, which we shall hereinafter name the logician-linguistically model of management, appeared, when in sphere of the automations turned out to be the involved objects so complex nature that traditional methods to theories of management turned out to be for them or малоэффективными, or simply unfit. The difficulty of the building to models of management construction is explained following.

1. Not all purposes of object management can be denominated in the manner of quantitative correlations.
2. Between beside parameter, influencing on process of management, does not manage to install the exact quantitative dependencies.
3. The Process of management is many steps, and contents of each step cannot be beforehand is uniquely determined.
4. The Existing ways of the description object and running in them processes bring about so bulky design that their practical use impossible.
5. If several increase understanding the term "object of management", comprised of it, for instance economic or social objects then to enum

- erated reason to inefficacy of the classical methods abutted against-pouring possible to add, at least once, else three.
6. The Purpose of existence most object cannot be is strictly worded and, more so, quantitative denominated.
  7. The object evolutions at time, is changed its structure and functions that brings most process of management about evolutions.
  8. The Elements, falling into structure of the operated object, have an active nature. Their behavior can disagree the purpose of management; they can render the inverse influence on managerial system itself.

The Situational approach for present-day is one of the most perspectives in modern science about management. On the one hand, he presents one of the designed instruments for consequent, complex, system analysis situation taking the important management decisions. On the other hand, he allows revealing the main trends, as well as the main controlling influences, capable to influence on development of the situations. The Situational approach allows the leader alongside with holistic presentation of the object of management and its operation in external ambience to realize efficient management concrete situation taking the management decision. The scheme of the building to models of construction management looks as follows:



To use the methodology [2] for the following automation of searching for of the optimum management decision necessary will enter such object-oriented categories as "Data-hold device", containing set of the procedures deductive and induction conclusion, as well as usual simulation procedures, by means of which occurs "проигрывание" consequence of the acceptance that or other decisions on several steps onward. The Procedures of the planning allow to solve two problems: build многошаговое management and value efficiency that or other alternative decisions. After choice controlling influences or plan многошагового influences "Data-hold device" gives him (it) on object of management and simultaneously reports on its choice "Qualifier", which uses this information for improvement given in "puff pastries".

The most difficult for governing is that event, when received situation at all is not classified in "Qualifier". In this case information on she enters in "Correlator", in which is kept knowledge about law of the operating the object, restrictions on controlling influences, given on object, and target structures. On the grounds of received information "Correlator" chooses the possible influence on object of management and gives information on this choice in "Qualifier". "Qualifier" on this decision refers the received observed situation in that a generalized description, which corresponds to the decision, formed in "Correlator".

If this generalization does not generate other alternative decisions, that "Qualifier" gives information on accepted decision. But if as a result of generalizations it will turn out to be that in observed situation possible to take and the other decisions different from recommended "Correlator", that these decisions communicate last. "Correlator" checks admissibility of the new decisions. All are a possible decisions are then sent in "Data-hold device", which and produces amongst them choice of the final judgments on management.

The Base of this method are semiotic modeling, but конкретнее - a logician-linguistically approach of searching for of the decisions on management. The Construction (S) presents itself collection technical (T), social (C) and economic (E) of the systems i.e.

$$\bar{S} = TUCUE$$

Each of these systems (T, C, E) is defined by ensemble quantitative and qualitative sign, accordingly  $t_i$ , where  $i \in (1, m)$ ;  $c_j$  where  $j \in (1, n)$ ;  $e_k$ ,

$$k \in (1, p), \text{ but } m, n, p \in Z;$$

$Z$ , is an ensemble of integer positive numbers interconnected and uniquely describe which only with the help of functional relationships impossible.

Verbal description construction wholly on natural language possible, but this information heterogeneous and great on volume that does not allow to work out the method, based on using information technology, for finding of the rational decisions of construction management.

For decision given problems reasonable to use information-communication technologies, which on given moment well develop both with technical, and with programmer sides. Aside from this is at present designed and continue be developed languages of the presentation of the knowledge, which allow more effectively use computer technologies for decision real practically important problems. The account of the qualitative features of the complex systems allows to find the optimum decision on complex system management.

The logician-linguistically models in managerial system in construction a development rational agent logician-linguistically method on the base of the syntheses эволюционного modeling, morphological cards, function-physical and function стоимостного analysis. The Development rational agent on base logician-linguistical methods is based on sentential logic methods, which is well designed. The Expected result is concluded in that meta system designing greatly raises efficiency of the process of the designing: raises the quality of the result of the designing with reduction трудозатрат at achievement put purposes of the project, as well as reduces the time of the designing. For decision making of the choice rational tacticians necessary to get reliable information on condition of the under investigation object, define the forecast of the condition on level homeostaz as a whole. In holistic system appear the new regularities, not characteristic separate system element. It is required on local behavior of the process to define its integral feature.

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The Account of the qualitative features of the complex systems allows finding the optimum decision on complex system management. Particularly well it has proved; proven to be the logician-linguistically methods of the building of the models of management complex system /1/. The Logician-linguistically models in managerial system in construction - a development rational agent logician-linguistically methods on the base of the syntheses evolution modeling, morphological cards, function-physical and function cost analysis.

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