Communicative problems of management during the construction of transport facilities

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Abstract. The article discusses the problematic aspects of communication using information and intelligent environments in the construction industry - software systems for BIM modeling and management of production and transport logistics on the construction site. Issues of effective communication in software environments for network management and enterprise management improvement are considered. The article notes the importance of role-based communications in the innovation process. Based on the information approach to the development of communications, we show the possibility of creating institutional forms of innovation in the management of construction production and transport with the help of software packages for BIM modeling and production control and logistics management.

1. Introduction

Modern problems of engineering sciences affect the issues of effective communication, including logistics, and production management, taking into account remote communication methods between all structural components of the production process. The innovative way of developing the economy and the building industry actualizes the task of forming personnel capable of carrying out operational management of innovative processes in various areas of social and industrial activity [1].

The purpose of this study is the effective management of a building company, taking into account the communicative capabilities of network and remote management.

The research objectives are:

1) study of linguistic and communicative management capabilities in modern information systems of BIM-modeling and production management.
2) identification and elimination of the effect of the accumulation of distant communication errors in modern information systems BIM-modeling and production management.

The basis for this study are the works of V.V. Talapov [2], O.A. Pobegaylov [3], V.A. Pogorelov [4], V.V. Kostyuchenko [5], O.V. Klyuchnikova [6], K.M. Kryukov [7], K.A. Tsapko [8], L.B. Zelentsov [9], S.S. Susoev [10], and others.

All these works indicate the promise of the introduction of information technology in the construction industry in terms of effective communication between all parties to the building process. These include the efficiency of transport processes and logistics of construction production. Such as the customer, investor, general contractor, planners, cost estimators, financiers, structural and executive staff, transport unit, and regulatory authorities. All this increases the transparency of the processes occurring in construction and accelerates the production cycle. The ability to integrate various representatives of the organizational and production structure into remote access increases the
ergonomics and financial attractiveness of production, since it minimizes the loss of time for additional communication and improves the quality control of work performed.

2. Materials and methods

Modeling of building processes in various environments is faced with communicative problems, which, according to the authors, must be addressed comprehensively: both from the point of view of improving the functionality of BIM modeling and production management programs, and from the point of view of the availability of natural language communication between participants in the production cycle.

Remote control is constantly faced with the loss of part of the information and the accumulation of errors associated with the personal communicative factor, when the subsequent communicative link cannot fully receive the information and realize it completely. This takes to errors in operational management and production delays.

For example, an error in the calendar schedule associated with an incorrect reading of the date of the control segment (25.03 instead of 15.03) during the implementation of one of the building objects led to the accumulation of a number of incorrect decisions and financial losses for the contractor.

In our opinion, this problem should be examined by specialists in different fields in the unity of a multidisciplinary approach.

The proposed model of linguistic productivity management in building is able to solve some problems of creating effective communication, ultimately, allowing for stable, efficient and timely production management. The structure of the interaction of communicators in the building company - is the determinants of competencies specific to each type of activity. It has been repeatedly proved that with the help of an active (quantitatively) and open (qualitatively) dialogue it is possible to influence an employee’s innovative behavior [12, 13]. Organizations themselves are directly included in the system of social interaction, exist and reproduce only thanks to this interaction. Communication is the essence of social interaction. Thus, communication has the function of reconstruction of reality at any given moment of time for each of the participants in communication [8, 9]. The network nature of communication gives it all the features of a “circulatory system”, in which the generated text - the most common form of information exchange - is transmitted from link to link, replenished and enriched, or distorted and duplicated. Communication productivity is the quality of the production, transmission and interpretation of meaning that transform the state of reality. From our point of view, the criteria for the productivity of communication are related to its ability to implement the basic functions of the activity and ensure interaction within the company [4, 15, 16]. The quality of sense production and meaning, that is, the efficiency of communication, is extremely “loaded” with the state of organizational productivity in general and the consequences of errors, deviations, distortions. The ability of language to produce a perfect image of the product, which is realized in the motivation for its physical implementation, it turns out in this case, the decisive factor. The speaker as the ideal creator of the linguistic picture of the real world, in this case, is the main generator of meanings and because of the final product. Organization management is the operation of linguistic personalities (“speakers”), connected by inextricable communication links in a single interaction process, no link from which can be excluded without loss in performance and functionality of the entire system. Therefore, the management of an organization is in many ways the operation of a linguistic network of functioning linguistic personalities [11]. Thus, linguistic efficiency in a company turns out to be its economic and production performance. Accordingly, the quality management of the organization, in particular the construction one, should proceed from the nature of a stable communication network, where the information image of the product is constantly generated and reproduced in reality. c.

3. Results and discussions

As an example of the implementation of effective linguistics, we can cite an example of improving the distant management system BittRix, carried out in the organization LLC “RP Stroymehanizatsiya-MA”. In this organization, work has been done on the study of the company management
communication network, which has made it possible to improve operation. The following changes were introduced:

1) Decrease in information load due to rationalization of texts of documents. Required linguistic processing of texts of administrative documents with a view to eliminating distortions, unnecessary communicative elements.

2) Reducing the volume of information due to the rejection of a number of unreasonable information exchange procedures, reducing the volume of processed text.

3) Reduction of unreasonable connections, redistribution of communicative roles.

4) Formation of a justified system of competencies and responsibilities at all communicative levels in compliance with the necessary regulations (function “access roles”).

5) Control of information discipline. As the organization’s reviews showed, the work on introducing a system of “effective linguistics” made it possible to optimize production and simplify enterprise management.

The software of modern remote control systems allows us to structure all operational, technological, design and logistics solutions in a single management environment. As already mentioned, streamlining communication in these environments allows you to achieve greater productivity and labor efficiency in building.

The analysis shows that the most popular among similar software products are Synchro Pro (purchased in 2018 by the Bentley System) and Navisworks Manage, developed by Autodesk.

When comparing these two products, you can see that Synchro Pro is a more specialized program with wider functionality in the field of 4D-design, while Navisworks Manage includes a number of other functions for 3D coordination and calculation.

Management programs based on information technologies of managerial synthesis (for example, “ROST”) make it possible to select effective directions (based on the sum of individual factors) for intensification of construction production.

The final products of these programs are to ensure the actual growth of labor productivity. The thematic focus of their work should be more subordinated to the transfer of this system to the path of intensification and growth of labor productivity, the introduction of intelligent control systems in building production, taking into account the requirements of effective communication. In our opinion, the number of areas of intensification that are being developed within the framework of the management information complex can be limited only by the capacity and productivity of the equipment and the training of the managerial staff capable of managing this technology.

On the other hand, as the analysis of the introduction of complex technologies of managerial synthesis shows, some of the completed developments do not receive practical application. Currently, the number of employees per 1 million rubles of construction and installation works ranges from 0.1 to 2.03. All of them are linked into a single communication environment, where each has at least two communicative-regulatory chains. It seems to us that such a procedure for establishing the number and communication of employees does not stimulate the growth of labor productivity and the efficiency of building production. The considered indicator should be directly dependent on the level of labor productivity actually achieved. In this case, specific organizations and units will bear self-supporting responsibility for the actual growth of output. The headcount ratio should be revised depending on the actual impact of integrated management measures on the main indicator - increasing labor productivity. However, there are cases when those performance indicators that are not documented are taken into account. Mistakes, postscripts, misuse of funds, the use of unskilled labor reduces the sign indicator performance of building production.

It should be borne in mind that in carrying out such calculations it is only necessary to take into account the actually obtained effect, confirmed by the relevant documents in the prescribed manner.

Currently, labor productivity growth using “smart technologies”, in particular managerial synthesis, ranges from 0.6 to 3.5%, while the potential in this matter is still great.

To increase labor efficiency and enhance the impact on productivity growth is necessary:
• to assess the work of design and technological stages by the final actually achieved level of labor productivity growth in the form of its final products. Do this autonomously and independently, with a program of information management and simulation;
• to develop and adopt common rules and standards for the building company functioning on the basis of its strategy and in-production facilities - typical states, functional services, rules and fees for services, order planning, uniform forms of accounting and reporting system and procedure for material and moral incentives etc.;
• the coefficient of numbers to establish in direct proportion to the actual growth of labor productivity, taking into account the appropriate amendments, depending on the result;
• to practice the removal from the execution of the approved work plan for the facilities, complexes or sections of the cost of non-integrated development.

4. Conclusion
Thus, to achieve the best results when managing using global networks and modern software systems of BIM-modeling and production management, ensuring stable feedback of the software complex is not present in all BIM-modeling programs. This has a particularly strong impact on the effective organization of construction production logistics - timely provision of the construction site with everything necessary. Violation of transport processes, logistics errors lead to an increase in losses and construction costs, and an unfair increase in the cost of the object.

In some cases, the software does not imply the receipt by the end user of an extensive network of information in its primary meaningful sense. Discarding the interpretation error, it should be noted that each link contributes to the source text, and the information is presented purely in text form (speech - no more than three network links), conceptually new meanings.

The identification of barriers to productive communication makes it possible to intensify production in conditions of economic and other environmental uncertainty, reduce losses associated with subjective reasons, activate and motivate staff. Elimination of non-functional links in communication, increasing channel capacity, realistic communication network management, understanding the nature of the communicant's linguistic personality are the key to the successful functioning of the company.

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