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Information management in the application of BIM in construction. The roles and functions of the participants of the construction process

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Abstract

One of the effective tools to improve the quality of construction, expenditure control and logistics management is the use of BIM-technology in the construction process.

A necessary step for the mass application of BIM-technologies in construction is the use of valuation techniques and information models to formulate requirements to them.

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Keywords: construction; BIM; information management.

For standardization methods for the use of information models and the formulation of requirements for them must be clearly define the roles and functions of the participants in the construction process.

After reviewing the regulatory documents and international experience in the organization of construction, you can identify a number of roles of participants in the construction process: Customer; Designer; The organization carrying out the construction management; The organization carrying out the demolition sites of the objects; The organization carrying out the civil works; The organization carrying out the installation and commissioning of electrical systems; The organization carrying out the installation and commissioning of water and wastewater systems; The organization carrying out the installation and commissioning of HVAC systems; The organization

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carrying out the installation and commissioning of low-voltage systems; The organization carrying out the installation and commissioning of gas supply systems; The organization carrying out the installation and commissioning of vertical transport systems; The organization carrying out the installation and commissioning of external networks water supply and sanitation; The organization carrying out the installation and commissioning of the external heat supply networks; The organization carrying out the installation and commissioning of the external electric and low-voltage systems networks; The organization carrying out the installation and commissioning of process equipment; Authorities of environmental supervision; The authorities of fire supervision; Local executive authorities; State control authorities.

For ease construction of model of information exchange in the construction industry using BIM technology is acceptable to enlarge the selected function on the criteria enabling to maintain the logical distribution of functions on the allocated roles and operations of construction production.

So, the function F1 "Preparation of documents for the start of construction" includes the construction permit; obtaining the right of limited use of adjacent land (easements) at the time of construction; involvement of the contractor (general contractor) to carry out works on the construction of a building or structure as a person engaged in construction, in the case of implementation of the contract; maintenance of construction project documentation has been examined and approved in the prescribed manner.

The F2 function includes providing a stakeout building control lines and the establishment of geodetic bases.

The F3 attract copyright persons supervision, carried out the preparation of project documentation for the construction of the facility; notice of the beginning of any work on the construction site construction supervision authority of the state, which is under the control of the entity; providing construction control the builder (customer).

The F4 function is acceptance of the completed project construction in the case of the work under the contract; organization commissioning and testing equipment, test production and other activities to prepare the asset for use; the decision to start, suspend, conservation, cessation of the construction, commissioning of the completed construction of the property in operation.

The F5: presentation of the completed project construction authorities state construction supervision and environmental monitoring (in cases stipulated by the legislation on urban planning); presentation of the completed project construction of the authorized body for commissioning; acquisition, storage and transmission of relevant organizations of the executive and operational documentation; notification timing of the start of the construction site, to suspend, conservation and (or) the termination of the construction of the facility ready for commissioning local governments and the state building supervision.

The F6 function consist of checking for a person engaged in the construction, as the documents (certificates in certain cases) for materials, products and equipment, documented results of incoming inspection and laboratory tests applied to them; monitoring compliance with the person carrying out the construction, warehousing and storage rules applied materials, products and equipment; the detection of violations of the rules of representative building control developer (customer) may prohibit the use of improperly stockpiled and stored materials; control of compliance of the person performing the construction, operational control; control of the existence and correctness of the person performing the construction, as-built documentation, including an assessment of the reliability of geodetic executive schemes made designs with selective precision position control elements; control over elimination of defects in the design documentation identified during construction, documented return defective designer documentation, control and documented acceptance of the corrected documentation, sending it to the person performing the construction; control face execution, carrying out construction, the requirements of public oversight and local government.

The F7 function assumes a notice of public oversight of all cases of state of emergency at the construction site.

The F8 function assumes assessment (together with the person exercising construction) for work done, construction, engineering systems areas, the signing of bilateral acts confirming compliance; monitor the implementation of the person performing the construction requirements of the inadmissibility of the subsequent works before the signing of these acts; final evaluation (together with the person exercising construction) compliance completed project legal requirements, design and regulatory documentation.

The next block of functions is the function of the builder.

F9 is the execution of works, structures, engineering systems ensure construction of the facility in accordance with the design and working documentation; development and application of organizational - technological documentation.

The F10 function is the implementation of building control persons carrying out the construction, including the monitoring of compliance with the applicable building materials and products with the technical regulations, design and working documents; executive management documentation.

The F11 function assumes providing safety on the construction site, safety of construction works for the environment and the population.

The F12 function is construction site management, including ensuring the safety and security of the construction site of the object before its acceptance by the developer (customer); implementation of the requirements of the local administration, acting within its jurisdiction, to maintain order on the building site adjacent to the site.

The third block of functions is function of designer.

F13: development of project documentation; Adding to the design and estimate documentation and working in the prescribed manner of changes in case of changes after the start of construction of the urban plan of the land or existing regulations (performed as an additional operation); changes in the design and estimate documentation in connection with the need to take account of technological capabilities of the contractor; development of additional design decisions in connection with the need for production.

The F14 function is management supervision of the contract with the builder (customer), including in cases stipulated by the current legislation; coordination of deviation from the working documents, including decisions about the possibility of the use of non-conforming products.

The next function refers to the work of local governments and the state building supervision and it is control building in accordance with applicable law (F15).

And the last block of functions applies to person carrying out building control.

F 16: incoming inspection of the project documentation provided by the developer (customer); geodetic survey of the basics of object of capital construction; incoming inspection of used building materials, products, structures and equipment; operational control in progress and upon completion of construction and installation works operations; inspection of work performed, the results of which are not available for the control after the start of the subsequent work; inspection of building structures and critical sections of engineering and technical support systems; testing and testing of technical devices. building control developer (customer) in accordance with the current legislation takes the form of control and supervision of the customer for the performance of work under a construction contract, as part of building control performed supervision entity in charge of the preparation of project documentation (designer).

The diagram (Figure 1) shows the distribution of specific weights of the functions of participants of the construction process, depending on the number of sub-functions included.

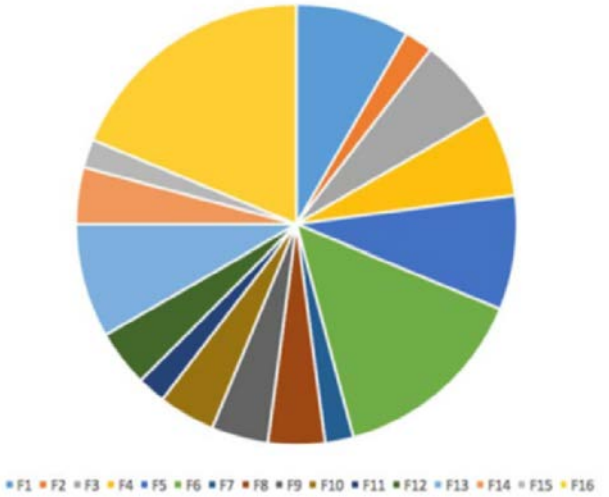

Figure 1. Distribution of sub-functions by functions participants in the construction process

Next, you need to compare the features of participants of building production with the roles of participants of building production, which have been identified. Correlation functions of the participants with the roles, refer to the table 1.

Table 1. Correlation functions of the participants with the roles

	F1	F2	F3	F4	F5	Ф6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16
ustomer	X	X	X	X	X	X	X	X								
Designer													X	X		
The organization carrying out the construction management										X	X	X				
The organization carrying out the demolition sites of the objects									X		X					
The organization carrying out the civil works									X		X					
The organization carrying out the installation and commissioning of electrical systems									X		X					
The organization carrying out the installation and commissioning of water and wastewater systems									X		X					
The organization carrying out the installation and commissioning of HVAC systems									X		X					
The organization carrying out the installation and commissioning of low-voltage systems									X		X					
The organization carrying out the installation and commissioning of gas supply systems									X		X					
The organization carrying out the installation and commissioning of vertical transport systems									X		X					
The organization carrying out the installation and commissioning of external networks WS									X		X					
The organization carrying out the installation and commissioning of the external heat supply networks									X		X					
The organization carrying out the installation and commissioning of the external electric and low-voltage systems networks									X		X					
The organization carrying out the installation and commissioning of process equipment									X		X					
Authorities of environmental supervision											X					
The authorities of fire supervision											X					
Local executive authorities															X	
State control authorities																X

The distribution functions along the roles of participants of the construction process is graphically shown in the diagram (Figure 2).

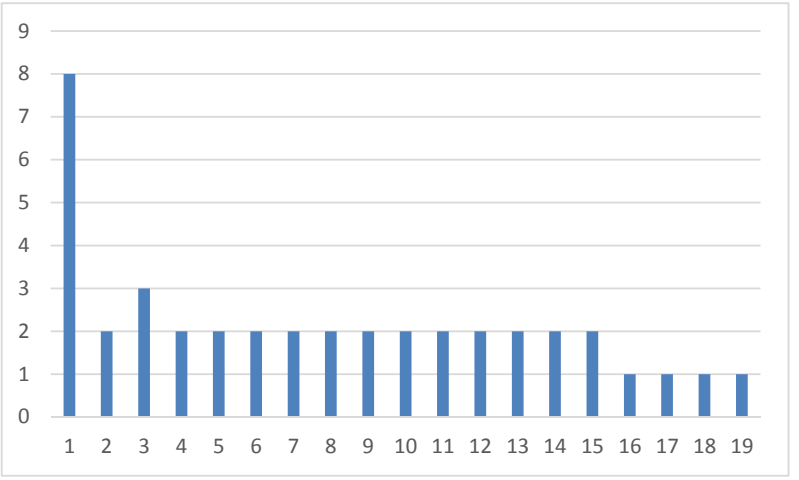

Figure 2. The distribution functions along the roles of participants of the construction process

Thus isolated and correlated with each other participants in the construction process, their roles and functions.

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