Abstract

Communication problem in construction industry is an important matter due to its direct influence on quality of works. Digital support such as BIM software could help in increasing transfer of information between parties. Authors noticed a need for solution to streamline collaboration between stakeholders at a final stage of the investment. Customer at the construction site, is not involved in the construction process until handover. However, he is the one responsible for acceptance of the construction works by signing the final acceptance protocol and verifying whether works have been done according to contract and variations. Due to defects occurring as a result of construction works and nonconformity with variation order or original design, authors suggest creating a program to simplify communication and improve the exchange of information limited not only to construction, but also during the transition phase between the final stage of construction works and the initial stage of operation of the facility. Case study was conducted to reveal the actual digitalization level of recording final works inspection protocol and defect management system at housing construction sector in Poland.

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Keywords: defect management, communication in construction, transfer to operation.
1. Introduction

As described by A. Agner [1] Poland is on the verge of implementing BIM in public procurement, but there is still a lot to do before it is brought to life. Anger et al. suggest following eastern countries like United Kingdom example, knowledge deriving from their experience may lead to increased BIM introduction rate in Poland. This is why establishing Implementation-Coordination Center for BIM in Poland is suggested, which would be responsible for matters such as work on legislation issues, standards, norms, substantive supervision on pilot programs. Some basic barriers are mentioned: aversion to changes, lack of understanding, architects fear of losing leading role in construction projects, concern about corruption being blocked by contract transparency. Movement in construction sector stakeholders has contributed to organizing conference on Application of modern tools in process of construction works public procurement that was held by Public Procurement Office in December 2015. All public procurers were invited, and information on what BIM is has been spread by speakers from most important polish construction sector associations and universities representatives.

Taking into account current achievements in the field of modern BIM solutions in Poland and abroad, as presented in the document "Building Information Modeling" by KPMG, published on 30 September 2016 by the Ministry of Infrastructure and Construction, the national implementation level is not one of the highest, and implementation of BIM should be started with pilot projects by progressive introduction, done in stages, during which such elements as guidelines and standards should be worked out [2].

A need was established to create an information exchange standard, document creation and management standard for design, construction standards and facility management standards. As missing in the Polish market, there are also shortcomings in system of qualification of construction works, and currently binding is defined as inappropriate for data structure in the construction process. With regard to public procurement, in order to start investing in modern technology, above all, a top-down order is needed, as was the case in the United Kingdom. [2]

Regardless of implementing BIM in public procurement, enforcing law changes is vital also for commercial construction. While disputing about BIM implementation in construction industry, long term outcomes should be taken into consideration. The aim of this paper is to present a need for communication improvement between stakeholders of construction process at final stage of investment. Case study was conducted to reveal actual state of digitalization of procedures in transfer to operation phase. BIM application in handing out process is pointed out as an advantage, that could help to achieve planned results for commercial investment that would be handing out apartments with as little failures as possible.

2. Communication in literature

Communication is crucial to correct execution of complex projects performed by teams. This situation is typical to construction industry in which many stakeholders need to exchange information in order to achieve obtained goal.

Emmitt and Gorge [3] reveal that problems in construction come from communication breakdown meant as “the failure of one party to convey his or her intentions to another, leading to misunderstanding and associated problems that such a state might bring”.

Shirkavand et al. [4] show that poor communications between people in construction may lead to defects, also giving minimization measures as early involvement in the project by user, active participation in construction meetings, giving detailed information on project specification and having devoted project manager to not too many construction projects.

As written by C.-S. Park et al. [5], there are three main problems with field inspection negatively impacting construction quality inspection are:

1) workload - taking as much as 38% of construction manager work time, due to manual inspection and complexity of problems – automatization is proposed as a solution;
2) data loss – miswriting and wasting defect information due to the way information is input – mobile inspection application is proposed as a solution;
3) reactive approach – revealing defects after they appear – technologies such as BIM and AR could lead to proactive approach and help control construction process before failure occurs.
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