

On the Building Information Modeling of Capital Construction Projects Market Development

Olga vladimirovna bakhareva

Abstract

Sustainable economic development of the construction industry in Russia is only possible with the application of modern BIM-technologies. The construction enterprises are facing a number of problems during the process of implementing new information technologies the main problems being: the lack of funding for business development under the conditions of protracted financial crisis within 2014-2016 time frame, as well as the lack of a national industry standard of working with BIM-technologies. The step-by-step introduction of BIM- technology in Russia is planned by the Government for the period up to 2018. We offer an economic mechanism of lower production and transaction costs of development as a result of the BIM-technology introduction, taking into account successful experience in the regional economy of the Republic of Tatarstan. In our opinion the practically well-proven mechanism of introduction of innovative technologies in regional economy in public construction companies, constructing infrastructure projects, and private construction firms and approbation in practice and summarizing the lessons learned will enable one to develop building information modeling services market and ensure the sustainable economic development of the construction industry in the region. The improvement of the efficiency and transparency of the building production will create conditions so that they attract domestic and foreign institutional investors which, in turn, will allow a business to implement strategic development program for the prosperity of the economy.

Keywords: Sustainable Economic Development; Regional Economy; The Construction Industry, BIM-Technology Institutional Changes

Back Ground

The BIM market had witnessed a growing demand in the pre-COVID-19 scenario. As worldwide population and economies grow, the increased need for housing and infrastructure development is likely to fuel the growth of the global construction industry, thereby creating a strong demand for BIM from construction professionals to plan, design, and manage building projects more efficiently. Thus, the 3D model-based approach of BIM in delivering construction projects has been gaining traction across the world. The architecture, engineering, and construction (AEC) industry consists of architects, engineers, and contractors who work together to make a project successful. Rising trends of advanced technologies have led to the growing adoption of innovative approaches in the working standards of the construction industry. BIM is one such approach that provides benefits such as visualization and collaboration, synchronization

of design and construction planning, conflict detection, and cost reduction. Although these factors will still contribute to the growth of the BIM market, it will not reach its earlier forecast that was estimated to reach 9.5 billion in 2025, at a CAGR of 12.7% from 2020 to 2025.

The outbreak of the COVID-19 virus in December 2019 has resulted in the rapid spread of this disease to almost 100 countries across the world. The World Health Organization has declared it a public health emergency. COVID-19 is expected to have a negative impact on the overall BIM market. The Associated General Contractors of America (AGC) reports that at least 45% of contractors are experiencing delays or disruptions due to the outbreak. These delays are due to the shortages of materials, parts, and construction equipment. Apart from this, lack of skilled labor and construction safety equipment are among a few of the major factors affecting the overall industry. Additionally, some construction projects are being halted or delayed because of asymptomatic workers as there would be a temporary shutdown if any employee is tested positive. As the AEC professionals are the largest end users of the BIM software, which is used mainly in the construction projects, a delay or cancellation of these projects would have an adverse impact on the overall BIM market. The market is likely to recover gradually in the next 2 years and is projected to reach 8.8 billion by 2025, at a CAGR of 14.5% from 2020 to 2025.

Market Dynamics:

Driver: Rapid urbanization and increase in infrastructure projects

According to the UN, the world's population will increase to 8.1 billion in 2025 and reach ~ 10 billion by 2050. To address such a huge population, it is imperative for the AEC industry to provide smart solutions to develop infrastructure for the future. As populations and economies grow, the need for housing and infrastructure will fuel the growth of the global construction industry. With an increase in construction, there will be a greater need for efficient ways of working. BIM gives architects, engineers, and construction professionals the ability to plan, design, and manage building projects more efficiently. Thus, 3D model-based approach of BIM in delivering construction projects is gaining traction worldwide. As BIM is gaining popularity, it is creating an international framework that can give an industry a proper direction and a rule-book to work with BIM.

Restraint: High initial cost of BIM

Although there are huge benefits and cost savings associated with BIM, the initial cost observed is high. For instance, the cost of