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IMPLEMENTATION OF BIM TECHNOLOGIES: THE EXPERIENCE OF THE UNITED KINGDOM

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Annotation. *This article presents the experience of implementing BIM technologies in the field of design in a foreign country, that is, in the UK. The history of the origin of BIM technologies in the UK will be considered, as well as the results and shortcomings that have arisen during the introduction of these technologies. The government's efforts to develop new technologies will also be mentioned..*

Key words*: BIM technologies, building Information modeling, designing, construction, Crossrail, UK BIM TaskGroup, "Construction 2025" strategy,BIM Level-3 .*

The global adoption of BIM began in 2002. From a historical perspective, this is quite recent. However, we can already speak about significant achievements in information modeling technology in certain countries and a global trend toward its widespread use.

The leaders in BIM implementation were almost immediately the United States and several European countries (the Netherlands, Denmark, Norway, and Finland), as well as Hong Kong and Singapore in Asia, with China rapidly catching up. Many other countries are also actively continuing to implement BIM technologies.

However, one country deserves special attention — the United Kingdom. Its experience in implementing BIM, the speed of adoption, and the achieved results should be carefully examined and studied in depth.

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A Brief History of BIM Adoption in the United Kingdom

The popularization of BIM in the design and construction of buildings and structures in the United Kingdom began in the early years of the 21st century, at a time when the country was facing a shortage of financial resources. More precisely, there was a lack of funds that could be allocated for the reconstruction or construction of new facilities. The government simply did not possess the necessary financial means.

During this period, the United Kingdom won the bid to host the 2012 Olympic Games and promised to hold the event at the highest level. For local sports enthusiasts, this event carried great symbolic meaning, but for the government, it became a constant source of concern. Naturally, there was no possibility of withdrawing from the commitment, yet implementing such a large-scale project seemed nearly impossible. As a result, local authorities began urgently searching for ways to overcome the situation [1,4].

In such a difficult situation, local specialists turned their attention to BIM design technology, which was rapidly gaining popularity around the world and promised, among other things, significant cost savings in the construction sector. There was no time for lengthy deliberation, so they decided to test BIM technology in practice.

The study and implementation of the technology were carried out on standard public projects that were carefully designed at the time — such as prisons, schools, and other facilities. As a result, very interesting outcomes were obtained, as it became possible to analyze the efficiency of various projects over several decades. Schools built using BIM technology turned out to be 30 percent cheaper. This fact gave rise to the idea that the use of BIM could reduce construction costs by up to 30 percent.

The London Olympics and Crossrail

The effectiveness of the chosen strategy in the United Kingdom had to be tested in practice — within the framework of a large-scale information modeling project. There was an urgent need to implement a vast, complex, and highly responsible project under tight constraints. The state client focused all efforts on controlling subcontractors and contractors.

Simultaneously with the construction of the major sports complex, the city administration decided to improve London’s transport infrastructure, which led to the creation of the Crossrail underground railway (Figure 1). The project began in 2009, with the first station opening in 2022. It is important to note that by 2012, the new line already connected Heathrow Airport with the Olympic Village. Such a high-quality project was made possible largely thanks to BIM technologies [2,5].

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Figure 1. The Crossrail Project

Results of BIM Implementation

After the introduction and practical application of BIM in the United Kingdom, the country gained extensive hands-on experience. The above applies to both clients and contractors, regardless of their level. It became possible to establish effective organizational mechanisms for managing interactions among project participants and other related processes.

Local authorities, despite bearing great responsibility, readily embraced innovations in the construction sector, even though BIM technology was quite new at that time. The decisions made during this period were quick, well-balanced, and error-free.

The boldness and prudence of these decisions were closely connected with the activities of the UK BIM Task Group — a team of experts established and funded by the government. The group was primarily responsible for developing the documentation and legal framework for transitioning from traditional construction methods to BIM. According to official data recorded in early 2013, approximately £4 million had been spent on its activities. However, the financial benefits from implementing pilot projects turned out to be significantly higher.

Several hundred specialized projects were launched in the UK by developers of various levels. These projects successfully demonstrated the advantages of BIM and allowed professionals to actively master information modeling technologies [2,6].

The government drew appropriate conclusions, and starting from April 2016, only companies and organizations capable of executing projects in accordance with BIM information modeling technology were allowed to receive publicly funded construction contracts in the United Kingdom.

Another important aspect noted in the new policy document was the lack of recognized protocols, standards, and compatible systems, as well as the variety

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of requirements imposed by designers and clients. The government's main efforts were thus directed toward developing new standards that would enable all project participants to collaborate effectively through BIM technologies.

The Construction Industry Development Strategy up to 2025

The Construction 2025 Strategy became the logical continuation of the United Kingdom's achievements in the construction industry by 2011 — particularly its growth rates and the adoption of new technologies. It was also part of the country's broader industrial development strategy, in which the objectives of a "digital economy" had already been defined.

After a series of professional discussions, the text of the "Construction 2025" Strategy was officially published on the UK government's website in 2013 (https://www.gov.uk/government/publications/construction2025strategy).

The main objectives of the British construction strategy — the final targets to be achieved by 2025 — are highly ambitious:

33% reduction in costs during both the capital and operational stages;

50% reduction in project delivery time;

50% reduction in harmful emissions.

Another key goal is to achieve global leadership in digital construction technologies and to use this advantage to expand the export of construction and consulting services, including the development and dissemination of British BIM protocols and standards.

A central role in achieving these goals was assigned to BIM technologies. It was expected that by 2025, the UK construction industry would reach a "critical mass" in BIM adoption. A later edition of the strategy clarified this target: by 2025, the construction industry was to transition to BIM Level 3, the next stage of information modeling development.

An important point to note is that the earlier government-commissioned pilot projects mentioned above were already implemented at a very advanced BIM level — in fact, at BIM Level 3. Currently, companies implementing BIM technologies determine for themselves which level of BIM is most appropriate for their projects, but they generally strive for the highest possible level. Starting from 2025, the government established BIM Level 3 as the mandatory standard for the entire industry, meaning that public projects (and major private ones) could not operate below this level.

The transition to BIM Level 3 is divided into four stages:

3a — improvements to the existing Level 2 model;

3b — introduction of new technologies and systems;

3c — emergence of new business models;

3d — leveraging global leadership in BIM [3].

Conclusion

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Modern-day United Kingdom has not only developed but continues to refine an effective and noteworthy experience in implementing BIM technologies. The core achievement lies in the formation of a strategy that aims to transform the construction industry to an entirely new digital level.

For the first time, the UK developed professionally crafted strategies, plans, and operational documents — all supported by practical results. Naturally, much of this success can be attributed to the active work of the UK BIM Task Group, whose efforts laid the foundation for the country's ongoing digital transformation in construction.

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