

Implementing body:	Lithuanian Builders Association (LBA)
Key features & objectives:	Digital Construction is a public institution that is leading the development of a national digital infrastructure in Lithuania, as well as greater use of digital construction technologies, building information modelling (BIM) and the national construction classification system.
Implementation date:	04/03/2014 – ongoing
Targeted beneficiaries:	Specialised contractors/companies.
Targeted sub-sectors:	All construction sub-sectors.
Budget (EUR):	n/a

In a nutshell

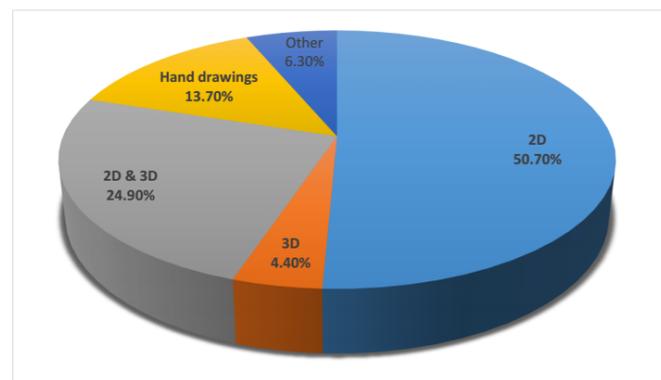
The Lithuanian construction sector is quite small compared to other EU countries, yet it accounts for a significant portion (10%) of national GDP and approximately 10% of national employment¹. The construction sector accounts for about 50% of all public procurement in Lithuania; however, labour productivity in the sector is relatively low, amounting to approximately 62% of the EU average in 2012². The growing cost of resources, the skills shortage and the need to compete with other EU countries that already have initiatives in place to improve competitiveness, are all factors that have made it essential for Lithuania to take a new approach and improve construction sector productivity and management³.

The use of information and communication technology (ICT) solutions in the European construction sector has grown rapidly in recent years. Many digital technologies are now available for all disciplines within construction, design and facilities management, and they are helping businesses to be more competitive. In 2012, the use of integrated technologies in Lithuanian construction projects was lower than in other European countries⁴. According to analysis done by Vilnius Gedimino Technical University (VGTU),

construction specialists were not well equipped with computers and requisite software. For instance, although 68% of qualified specialists have computers at work, less than 30% of them actually use ICT software⁵.

A 2014 construction sector survey by the Lithuanian Builders Association (LBA) also highlighted the need for Lithuanian businesses to integrate new working methods to make them more competitive, both nationally and internationally. As shown in Figure 1, the survey found that hand drawings and 2D were the main design methods in use. Changes to construction project planning were typically not well coordinated and building information was often unreliable⁶. Although 3D was typically used in the design phase, models were often not fully integrated and tended not to contain relevant information about construction objects, which goes against one of the main reasons for using ICT tools.

Figure 1: Design methods used in construction



Source: *Skaitmenine Statyba, 2014*⁷

The introduction of digital construction technologies and good practices in Lithuania is essential to make the construction sector sustainable and competitive, both nationally and internationally. It is made even more important by the fact that Lithuania has close economic ties with other countries that are among the most advanced users of BIM. To maintain and strengthen business

partnerships and economic ties, Lithuanian businesses must adapt and modernise their working methods.

Prior to 2012, the concept of digital construction was relatively unknown in Lithuania. Between 2008 and 2010, for example, only two programmes covering some aspects of digitalisation were run to teach students in Vilnius Gedimino University. The lack of sufficient education and training programmes is part of the reason why there is a national shortage of qualified specialists in digital construction.

Conscious of rapid ICT development taking place across Europe, Lithuania recognised that there was an urgent need to develop and implement a single digital construction information model⁸. In 2014, the Lithuanian Builders Association (LBA) created a public institution called Skaitmenine Statyba (Digital Construction) to coordinate the digitalisation process in the Lithuanian construction sector and enhance building information modelling and the National Construction Classification.

General description

The development of digital construction in Lithuania and its integration into national and international networks is associated with a variety of construction processes that use integrated information and communications technology (ICT) solutions⁹. In order to close the gap with other more advanced sectors in Europe, it was necessary to unite businesses, academic institutions and public organisations in Lithuania to:

- Enhance competition particularly in construction sector;
- Create closed infrastructure solutions;
- Integrate EU and international standards;
- Make Lithuania a competitive player in the construction market.

The former Ministry of the Environment set up a Working Group as the first step towards the introduction of digital construction in Lithuania¹⁰. Different specialists from various fields conducted a study for the Ministry to analyse the building lifecycle process in Lithuania and gather analysis from other Member States about their digital construction work and practices. The objective the study was to develop new measures to implement digital construction in Lithuania. Further analysis was needed to provide technical solutions.

One of the fundamental components of digital construction is Building Information Modelling (BIM). BIM brings together all of the information about every component of a built asset and provides a standards-based approach to building information modelling and information management. The normative base is one of the essential things in implementing a BIM system at national level¹¹.

The LBA established Skaitmeninė statyba (Digital Construction) as a public institution on 5th March 2014, bringing together many specialists from the private and public sector. It aims to be the

main player in the development and coordination of digital construction in Lithuania. The initiative currently has 13 member associations¹².

The Digital Construction institution is a collaborative initiative between the Lithuanian Government and business and science communities. The institution is driven by industry and aims to develop a single digital construction development infrastructure in Lithuania and to integrate it into related international networks. One of the initial goals is to develop a centralised database to connect different construction object databases to create a systematic process for complete construction object information management to avoid any potential overlaps in the construction process.

The initiative aims to implement several fundamental changes, which could be described as the formation of a totally new regime. The initiative covers the following aspects¹³:

- Unified requirements for building information modelling (BIM);
- Development of a single construction information classification system;
- Introduction to international data transfer formats;
- Implementation of BIM-related standards;
- Preparation of public procurement specifications (adjusting the practice of other countries);
- Encouragement for businesses to digitise and automate various construction processes and optimising operations;
- Enhancement and international promotion of the competitiveness of the Lithuanian construction sector.

The Digital Construction initiative has also formed Working Groups of digital construction specialists to work on various topics that include BIM standards, integration of digital construction with the Lithuanian legal system, development of National Construction Classification, IT infrastructure, public communication activities, international cooperation, university study programmes on BIM usage, and public procurement¹⁴.

Lithuania's new Ministry of Environment¹⁵ understands the potential needs to digitise construction in Lithuania and currently working intensively to find resources for full implementation of digital construction.

Achieved or expected results

The **Digital Construction public institution** is active in the Lithuanian construction sector and it is also showing strong interest in collaboration with international networks. In May 2015, for example, Digital Construction was approved as an observer in buildingSMART Nordic¹⁶ where they actively participate in conferences and meetings every year.

In total, 106 specialists from construction sector, academia, IT and public institutions are involved in implementing the Digital Construction initiative in Lithuania¹⁷. These specialists are working

in 11 Working Groups which were created to discuss the following topics¹⁸:

- Preparation of BIM requirements and standards, used in digital construction;
 - Preparation of guides;
 - Adaptation of IFC in Lithuania;
- Definition of the statistical index for the development of digital construction and description of the monitoring index for the BIM environment;
- Adaptation and analysis of adjustments to digital construction methodology and integration with Lithuania's current legal and regulatory system;
- Design and development of the national classification and coding systems structure; compatibility and integration with the EU;
 - Define and describe the structure for updating the classification and coding system, catalogues of databases;
 - Compatibility and integration of national and EU data bases, administrating and describing the order of usage of databases;
- Design, development, administration and description of the information and communication technology infrastructure for digital construction;
- Publicity, dissemination of the results of good practice, creating a positive image of the public body;
- Regional cooperation for BIM development;
- Establish BIM study and certification programmes, organize study programmes for high schools and informal training, validation of qualification, and set up a certification procedure for participants in the construction process, BIM project managers;
- Development of legal regulation for BIM-related public procurement.

In collaboration with the LBA, the Digital Construction institution has organised annual Digital Construction conferences in Vilnius, Lithuania. Every year, this annual conference increases its reach and generates greater public awareness. The number of attendees to the conference every year has gradually increased¹⁹. For example, the 2016 conference brought in a total of 400 attendees, a 100% increase on attendance at the 2015 conference.

Due to the fact that there is a shortage of skilled workers in Lithuania, the initiative has joined with universities to sign an agreement to provide more education courses on digital construction. The **Masters Programme on BIM technologies**, for example, was introduced in 2015 and now runs every year in VGTU. The aim of this Masters Programme is to train specialists, to enhance knowledge of BIM deployment and strategy, and to create and develop standards to guide and coordinate BIM drafting processes²⁰. A Bachelors Programme on digital construction design is also offered to VGTU students.

Since implementation of Digital Construction, Kaunas Technical University (KTU) has organised two **seminars** on digital construction for their students. The presentations are given by participants from private and public sectors. The aim of the seminars is to show students the importance of digital construction and BIM in Lithuania²¹.

Perspectives and lessons learned

From a **Government perspective**, the Head of Policy at the Ministry of Environment argues that the new government highly appreciates the idea of digital construction and is trying to find resources to implement this initiative. However, government points out that the successful implementation of digital construction can be achieved only with active participation and the involvement of construction sector businesses and the academic community²².

The Ministry's Head of Policy believes that the next important stage of implementing digital construction in Lithuania is the introduction of National Construction Classification (NCC). Establishing a single system and process requires all materials, processes and structures to be classified and coded in accordance with a unified classification structure. To achieve that, Lithuania must introduce a unified 'language' for building information classification and coding, which requires the building lifecycle to be processed by specialists in order to exchange accurate data²³. Building information classification and coding ensure that all phases of the building lifecycle, from the harmonisation of components and class codes, to data exchange and transfer time components and class codes remain stable, consistent for interpretation and are not duplicated.

NCC provides unified terminologies and methodologies to specialists in construction services, which improves project efficiency at national and international level. NCC is also important for the government because it could be used in the government's information and registration systems. However, this needs a lot of resources²⁴. At this stage, Lithuanian industry and the government would not be able to generate so much resources. From a government perspective, it is important for Lithuania to take the necessary initial steps towards digital construction and to find solutions and alternative options that are capable of generating the required resources. There is, however, no definitive government resourcing solution at present²⁵.

Digital construction presents a lot of opportunities for Lithuania. For example, the State provides over 50% of the total capital investment building construction. The use of digital technologies should be able to deliver significant savings (millions of Euros) through greater efficiencies, which can then be reinvested by the State²⁶.

One of the challenges that Lithuania faces, according to the Head of Policy at the Ministry of Environment, is the need to convince small business of the advantages of digital construction. Small

businesses are typically afraid that they will not be able to compete with larger businesses that are already familiar BIM users. As small businesses begin to understand that the integration of BIM software in their daily work is both unavoidable and beneficial, especially if they want to compete abroad (especially in the Scandinavian market), then they will take up these new technologies in greater numbers.

Looking towards the future of the digital construction sector, the Head of Policy believes that the European Commission should start developing common measures for digital construction for all EU Member States, because he argues that national measures can create problems in a single market.

From an **industry perspective**, the digital construction initiative will enhance public procurement transparency. The centralised platform and unified requirements will lead to better accuracy in construction projects, which will reduce procurement costs²⁷. According to AGA CAD, the initiative will create new jobs, help grow the number of competitive specialists, stimulate innovation and increase competitiveness in the construction sector. With digital construction, specialists can be more accurate in their measurements and calculations within a project. The initiative will help specialists to enhance their competitiveness and their ability to participate in international construction projects.

From the **perspective of a BIM consultant** at the **Association of Structural Engineers**²⁸, digital construction in Lithuania is still in the early development stage compared with other EU Member States. The initiative needs and related activities need greater financial support from the Government²⁹. Although the Government officially agreed to digitise the Lithuanian construction sector in September 2015, it has only allocated a small budget to the task. Members of Digital Construction and the LBA are working together to seek financial support from the EU³⁰. According to the BIM consultant interviewed, despite the rather small budget allocated to digital construction, the initiative is trying to expand its network and is building a strong partnership with universities and international partners.

From the **perspective of the Lithuanian Association of Consulting Companies (LACC)**³¹, the Digital Construction public agency is very active in providing the best material and information to anyone who is interested in digital construction. Various Lithuanian construction companies are working with international partners and have gained construction project implementation experience. LACC argues that better communication and more competitive teams are needed to compete in international projects. Lithuanian construction companies are quite new to digitalisation and innovative technologies in the construction sector. This tends to result in a low level of knowledge transfer³².

From the **perspective of construction services**³³, the main barrier for digital construction in Lithuania is that people are either

not convinced that digital technologies add value to the construction sector or they are not aware of the opportunities they provide. Many specialists still do calculations manually and information is gathered from drawings. The problem is that there is no transparency in the process as each specialist creates his or her own system to follow in a project. There is no database shared for project partners and drawings and specifications are usually carried around by hand. Another barrier to the introduction of Digital Construction in Lithuania is how smart technologies are perceived by construction companies. The use of integrated technologies in the construction sector is very limited and many construction companies consider the price of software as too expensive³⁴.

From the **perspective of a developer of BIM tools**³⁵, some specialists use counterfeit software due to the high price of official digital tools. With regard to small construction companies, many lack awareness and knowledge about software solutions and their potential, and therefore have no urgent need to buy expensive products. The Director AGA CAD sees many advantages to digital construction in Lithuania. In his view, the Digital Construction initiative is helping to create a more technologically advanced, innovative and competitive construction industry in Lithuania. The construction sector could then serve as an example of good practice to other sectors, to help encourage sustainability and green practices for instance. Furthermore, the initiative is helping to improve reliability and transparency in construction project delivery. This will support the growth of a stable industry and will contribute to the country's overall economic growth³⁶.

Endnotes

- ¹ Lithuanian Builders Association (2015), Annual report:
<http://online.fliphtml5.com/mcqhljpp/#p=4>
- ² T. Tanning, L. Tanning (2013), An Analysis of Working Efficiency in Central and East European Countries. American Journal of Economics.
- ³ Digital Construction (2014), On Development of BIM Methodology and Digital Construction in Lithuania over the Period 2014 - 2020:
http://skaitmeninestatyba.lt/files/Development_of_BIM_and_Digital_Construction_Lithuania.pdf
- ⁴ For example, over 95% of projects in Denmark (both public and private) have BIM requirements.
- ⁵ D. Migilinskas (2012), BIM technologijų taikymas virtualiam statybos projekto vystymui 5D projektavimo aplinkoje. Lietuvos statybų praktika ir problemos, taikant skaitmeninius modelius. PowerPoint presentation:
http://www.statybininkai.lt/Files/conf/8_BIM_taikymas_RESTA2012%20INRE_VGTU_Darius%20Migilinskas_v2.pdf
- ⁶ D. Gedvilas (2014), Developing Digital Construction and BIM in Lithuania:
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- ⁷ D. Gedvilas (2014), Developing Digital Construction and BIM in Lithuania:
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- ⁸ Digital Construction (2014), On Development of BIM Methodology and Digital Construction in Lithuania over the Period 2014 - 2020:
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- ⁹ Skaitmenine Statyba (2014), Skaitmenines statybos Lietuvoje gaires 2014-2020:
<http://www.lacc.lt/sites/default/files/0679780001454519865.pdf>
- ¹⁰ Feedback provided by Mr. Čergelis, the Head of Policy department in Ministry of Environment of Lithuania on 17/03/2017.
- ¹¹ Ibid
- ¹² Lithuanian Builders Association, Lithuanian Roads Association, Lithuanian Association of Consulting Companies, Lithuanian Architects Chamber, Lithuanian Association of Civil Engineers, Lithuanian Electricity Association, Lithuanian Association of Land Reclamation Enterprises, National Passive House Association, Project Expertise and Fire Safety Companies Association, Association of Buildings Certification Experts, Building Product Testing Laboratory Association, Structural Engineers' Club and Lithuanian EPS Association.
- ¹³ Lithuanian Builders Association (2015), Annual report:
<http://online.fliphtml5.com/mcqhljpp/#p=10>
- ¹⁴ D. Gedvilas (2015), BIM vystymo aktualijos Lietuvoje:
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- ¹⁵ The new term of Government started on end of 2016.
- ¹⁶ buildingSMART Nordic is a not-for-profit organisation that is member of buildingSMART International
- ¹⁷ D. Gedvilas (2015), BIM vystymo aktualijos Lietuvoje. Available online:
http://skaitmeninestatyba.lt/files/SKST'15%20skaidr%C4%97s/1_2_Gedvilas_BIM_vystymo_aktualijos_Lietuvoje_Skaitmenine_statyba2015.pdf
- ¹⁸ Skaitmenine Statyba website portal:
<http://www.skaitmeninestatyba.lt/darbo-grupu-temos/2-uncategorised/37-about-us>
- ¹⁹ Skaitmenine Statyba (2014), Skaitmenines statybos Lietuvoje gaires 2014-2020:
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- ²¹ Skaitmenine Statyba (2015), Seminare KTU dalintasi skaitmeninės statybos patirtimis ir galimybėmis:
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- ²² Feedback provided by Mr. Čergelis, Head of Policy at the Ministry of Environment of Lithuania on 17/03/2017.
- ²³ Ibid
- ²⁴ Ibid
- ²⁵ Ibid
- ²⁶ Ibid
- ²⁷ Feedback provided by the Director of AGA CAD Ltd on 10/02/107.
- ²⁸ Association of Structural Engineers:
<http://www.konstruktoriu-klubas.lt/>
- ²⁹ Feedback provided by a BIM consultant at the Association of Structural Engineers on 08/02/2017.
- ³⁰ Ibid

- ³¹ Lietuvos projektavimo įmonių asociacija (Lithuanian Association of Engineering Consulting Companies – LACC)
<http://www.lacc.lt/>
- ³² Feedback provided by Lietuvos projektavimo įmonių asociacija (LACC) on 02/02/2017.
- ³³ Incorpus – construction engineering consultancy:
<http://www.incorpus.lt/>
- ³⁴ Feedback was provided by a construction supervisor engineer at Incorpus on 01/02/2017.
- ³⁵ AGA CAD Ltd:
<http://www.aga-cad.lt>
- ³⁶ Feedback provided by the Director of AGA CAD Ltd on 10/02/2017.