



BIMplement

Developing a learning building sector by setting up a large-scale and flexible qualification methodology, which integrates technical, cross-craft and BIM-related skills and competencies

www.bimplement-project.eu

Report: D5.6 Implementation Service Concept

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HISTORY OF CHANGES		
VERSION	PUBLICATION DATE	CHANGE
1.0	31-08-2020	Initial version
1.1	29-01-2021	Revision due to the review meeting, clarification of details, provision of online links



1. INTRODUCTION

The implementation service concept (hereafter referred to as the ‘service concept’) refers to a set of tools that were developed to improve the replication and exploitation rates of the BIMplement project results. Its main purpose is to facilitate the transfer of nearly zero-energy building (nZEB) skills in a BIM-enabled workplace learning environment and to address all phases of the process through a cross-crafts, multidisciplinary approach. The service concept offers a means of implementing BIMplement elements and lessons while closely following the needs of potential users. This document highlights potential BIMplement customers, their needs, and the scenarios in which the BIMplement service concept may be used.

The circumstances of newly approached organisations are typically different to those that are in the initial stages of the project – newly approached organisations differ in terms of their organisational, technical, financial and human resource capacities and requirements. The service concept was therefore developed to outline the possible approaches and tools, which can be used in different organisations. It also outlines how these methodologies might be applied in different settings.

An enhanced systematic approach is needed to ensure quality control during the nZEB construction process and to reduce the gap between the design and operation of buildings. This requires a fully qualified and equipped workforce, capable of the necessary labour. It is important that the team understands their professional responsibilities and their relationship with the other professions involved.



BIMplement offers trainers and learners a range of tools to develop a fully qualified and equipped workforce that is capable of all the necessary labour. The main aim of the project is to improve the quality of nZEB construction and renovations through large-scale training, continuing professional development (CPD) and qualification schemes that address all phases in the construction process. A cross-crafts and cross-level multidisciplinary approach is used, facilitated by hands-on, BIM-enhanced workplace learning tools.

The following objectives are behind the use of the tools:

- To improve the overall quality of renovations and new constructions in a BIM-enabled workplace learning environment and to address all phases of the process, in a cross-crafts, multidisciplinary approach.
- To create a new generation of professionals and craftsmen who are equipped with BIM skills, to enhance the overall quality of construction and renovations across the entire process.
- To foster interaction between different trades and professions, enabled by a flexible qualification, certification and accreditation methodology

BIMplement facilitates:

- The horizontal upscaling of its methodology to accommodate new topics. (Topics are currently limited to ventilation and air tightness, for example.)
- Cross-country upscaling of the methodology – to identified member states with the use of a free and open methodology

BIMplement addresses the above aims by:



- Providing a self-instruction guide for implementing new technical or conceptual topics and for implementation in other member states. The guide is titled *Methodology Guide on Qualification Methodology, Raising Awareness Methodology and Methods and Support for Contractors*.
- The service concept, which is further exploited and promoted using the PROF/TRAC open training platform and BIMplement guides.
- Making use of the BIM Learning Centers.
- Collaborating and connecting with European umbrella associations.

BIMplement provides a range of tools for trainers and learners with the objective of developing a fully qualified workforce that is well-equipped for the necessary labour. This is achieved through integration with the BIM environment. In the BIMplement project, experience is gained through the real-life application of the BIMplement metod elements included in this document – by linking them with the potential needs of several building sector players.

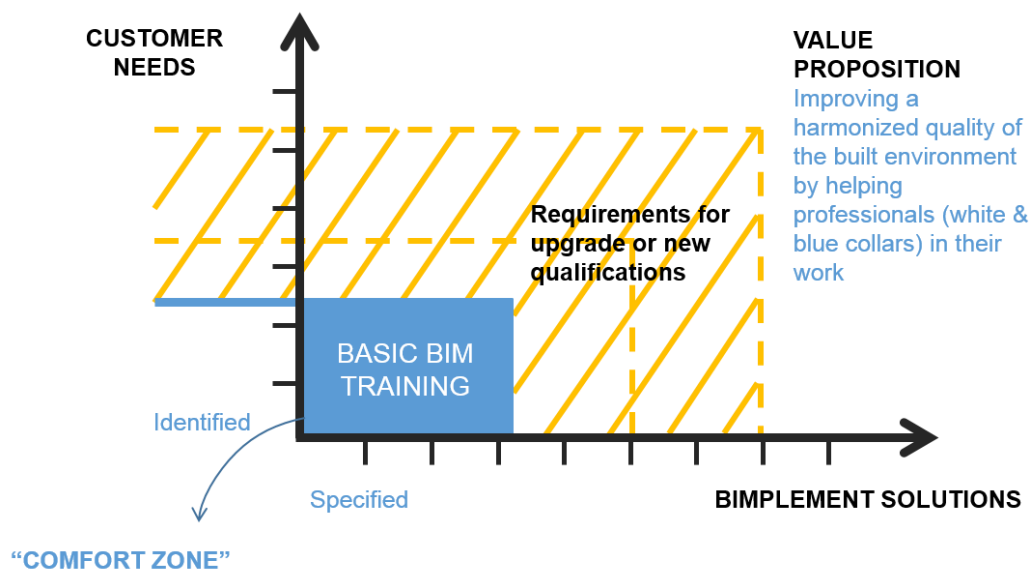


2. MAPPING POTENTIAL CUSTOMERS AND THEIR NEEDS

2.1 Value proposition

BIMplement goes beyond the basic BIM training needs – it addresses the requirements for upgrading qualifications or introducing new qualifications related to the quality of the construction process and to the nZEB requirements. See Figure 1.

Figure 1: Scope of BIMplement services

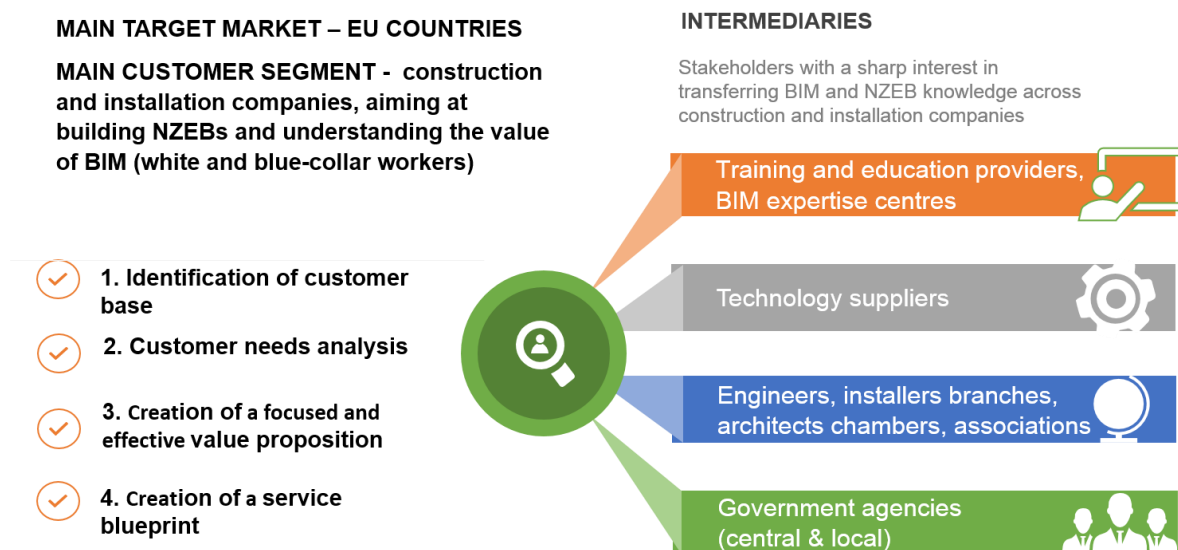


2.2 Customer and user needs

2.2.1 Customers' perspectives

Various construction sector players are the primary customers of the BIMplement tools and methods. See Figure 2.

Figure 2: BIMplement market and customers



The BIMplement tools and methods address the basic customer needs outlined in Table 1 below.

Table 1: Customer needs

Customer	Needs
Building and installation companies	<ul style="list-style-type: none"> To design, develop and build NZEB using BIM. To improve the implementation of processes. To enhance the construction quality control process with the use of BIM. To assess the company's BIM maturity level and training needs. To introduce BIM to the company. To train its staff (white- and blue-collar workers) on BIM and NZEB.
Training providers, learning and BIM expertise centres	<ul style="list-style-type: none"> To design a qualification and/or training programme for white- and blue-collar workers in the construction sector, to improve BIM and NZEB skills. To provide training to white- and blue-collar workers in the construction sector, to improve BIM and NZEB skills. To check the BIM maturity level of the company, BIM project or BIM project team. To market BIM and NZEB skills training programmes.
Architects' chambers	<ul style="list-style-type: none"> To raise awareness among architects of the aspects of quality control involved in the design process. To improve architects' understanding of the roles of other trades in ensuring quality of architectural design. To promote the use of BIM in achieving NZEB quality requirements.



Engineers, installers branches and associations (heating, ventilation and air conditioning [HVAC] and building services)	<ul style="list-style-type: none">• To raise awareness of the aspects of quality control involved in the engineering, design and construction process.• To improve White- and Blue-collar workers' understanding of the roles of other trades in ensuring quality building services.• To scale up upskilling to improve BIM and nZEB quality requirements.• To create and publish task-based qualifications for upskilling.• To standardise work processes for delivering quality.
Technology and material suppliers	<ul style="list-style-type: none">• To mainstream the application of their product-related knowledge in construction and installer companies.• To supply materials and technologies for the building education and training sector.
Government agencies	<ul style="list-style-type: none">• To promote and/or enforce the use of BIM in achieving NZEB quality requirements in specific territories.• To run BIM and NZEB promotion campaigns.• To scale up upskilling to improve BIM and nZEB quality requirements.• To make the playing field more transparent.

2.2.2 Users' perspectives

The task-based BIM-linked definition of the nZEB qualifications presented in the self-instruction guide reflects the needs of the end user groups, namely the white- and blue-collar workers. Their needs are addressed by the proposed BIMplement tools and methods.

- **White-collar workers:** These are the people working in the office. They are required to plan, design, monitor and inspect systems, effectively and efficiently – to ensure that buildings are airtight and ventilated. They are required to take regulatory requirements into consideration while doing this.

White-collar workers include:

- Staff at clients' offices, architect and project manager teams,
- Building company managers and design teams.



- **Blue-collar workers:** These are the people working at the construction site. They are required to be on-site to complete their job. They also require quick access to quality requirements, tools and instructions.

Blue-collar workers include:

- The site manager,
- On-site workers like site operators and craftsmen,
- Foremen.

3. STEPS IN THE BIMPLEMENT SERVICE CONCEPT

The BIMplement service concept comprises four main steps, which can be replicated by a variety of construction sector stakeholders in any selected territory (customers). See Figure 3 on the following page.



Figure 3: BIMplement service steps



4. THE BIMPLEMENT SERVICE CONCEPT

The BIMplement service comprises awareness-raising, qualification analysis, training, and consultancy. It contains several features, listed in the service concept, which closely address the needs of multiple building sector stakeholders as well as specific users. (See Table 2.) The functional benefits (outcomes of the features) are derived from a variety of BIMplement service elements, developed over the course of the project with the aim of pleasing users.

BIMplement is defined as a method of applying BIM for the development of a qualification and training aimed at increasing energy efficiency in buildings. It follows, then, that the BIMplement service concept is a structured method for planning qualification development and training. The method comprises four main steps. See Table 2 below.

Table 2: Service concept

BIMPLEMENT SERVICE	Language	1. AWARENESS RAISING CAMPAIGN						2. QUALIFICATIONS' NEEDS ANALYSIS				3. TRAINING		4. CONSULTANCY
		Definition of aims, process, results	Couchers' training	Organisation of seminars and conferences	Individual workshops with clients	General trainings	Training territory and site selection	BIM project maturity assessment	Scope definition	Project team BIM and NZEB skills assessment	Training programme development	White-collar workers' training	Blue-collar workers' training	Consultancy services
AWARENESS-RAISING TOOLS AND TEMPLATES														
Methodology guide and tools for awareness campaign on BIM and NZEB quality	EN													
List of criteria for the selected territories	EN													
Criteria for selection of sites for training	EN													
Training content and list of tools for BIMplement coach	EN													
BIM MATURITY ASSESSMENT, QUALIFICATION ANALYSIS TOOLS														
BIM capability assessment	EN/FR													
Self-instruction guide (allows definition of professional activities, related skills, required competencies)	EN													
Model NZEB cross-trade quality and BIM Skills Matrix	EN													
Catalogue of constructive elements	EN													
Elaborated quality control and qualification matrix for ventilation and air tightness as an example	EN													

BIMPLEMENT TRAINING PACKAGE	EN													
Tools and learning methods and qualification schemes for BIM workplace trainers	EN													
BIMplement coach training package	EN													
BIMplement kit	EN													
BIMplement field labs and experimental sites	EN													
DIGITAL TOUCHPOINTS	EN													
PROF/TRAC, http://profrac.eu/	EN													
Qualifications register www.statreg.lt (LT) and BUILD UP Skills Advisor-app (NL)	LT, NL													
youtube.com (IVE channel)	ES													
CLIENT ORGANISATIONS														
Construction companies														
Installation companies														
Design offices														
Training and education providers														
Technology suppliers (producers)														
Engineers, installers branches, architects' chambers														
Government agencies														



Annexures

Annexure: glossary of terms used

List of acronyms and abbreviations

Abbreviation	Meaning
BIM	Building information model
CPD	Continuing professional development
ECTS	European Credit Transfer and Accumulation System
EHEA	European Higher Education Area
EQF	European Qualification Framework
IAQ	Indoor air quality
ISO/IEC 81346	International Standard 81346. Published jointly by IEC and ISO, it defines classes and subclasses of objects based on a purpose- or task-related view of the objects together with their associated letter codes to be used in reference designations.
nZEB	Nearly zero-energy building

Definitions

Term	Meaning
Accreditation	Accreditation is a quality assurance process under which services and operations of educational institutions or programs are evaluated by an external body to determine if applicable standards are met. If standards are met, accredited status is granted by the appropriate agency (<i>Wikipedia</i>).
BIMAXON	BIMAXON is a human-readable classification of BIM element properties that facilitates communication, helps fill in gaps in the BIM process, and makes it easier for every actor to obtain and understand the information that they need at any given moment. It is based on BIM use cases and the needs of specific BIM actors to ensure that deliverables are right for every drop point and to provide exactly the right set of information to each actor at each moment.
Building stages & RIBA	A building life cycle consists of several stages. The RIBA Plan of Work is the definitive UK model for building design and construction processes.
Competence	A competence is the ability of an individual or organisation to do something effectively. It consists of a cluster of related abilities, commitments, knowledge, and skills that enable a person (or an organisation) to act effectively in a job or situation.
Initial education	Initial education is training received before entering the labour market. In general, it is based on qualification documents and corresponds to professional competency profiles. These qualification documents are drawn up nationally by the knowledge centres of the various professional sectors. Completing initial education results in the earning of a particular European Qualifications Framework (EQF) level and a diploma with unlimited validity.
Multi-layered qualification	A multi-layered qualification is a description of tasks that shall be performed effectively. It consists of a layer with basic tasks and one or more layers of context-specific tasks (e.g. nZEB-related tasks, BIM-related tasks, or indoor air quality (IAQ) tasks).
Occupation	An occupation is a job or profession.
Post-initial training	Post-initial training is training individuals receive after they have completed initial training. In general, professional post-initial training is based on demand from market parties for retraining. These short trainings most times result in a certificate with limited validity. They do not result in the earning of a particular EQF level.



Profession	A profession is a specialised occupation characterised by profession-specific education and training.
Recognition	Recognition in this context includes the pass of an examination or the official completion of a course, especially one conferring status as a recognised practitioner of a profession or activity.
Qualification	A qualification is a set of one or more qualification schemes.
Qualification scheme	A qualification scheme describes what a participant in education should know and master by the end of a (intermediate vocational training) course. A qualification scheme describes the level of beginning professional workers (school leavers).
Qualification structure	A qualification structure is a formal system describing qualifications. It makes visible which qualifications or sets of competences are sought by the labour market, education, and society so that an individual can secure a job, begin further studies, or participate in society.

Term	Meaning
Skill	Skill is the ability to do something well or an expertise.
Skill level	0 Not applicable/no knowledge or skills
	1 Has little knowledge and skills with respect to the relevant field/technology (i.e. mostly has outside the field of expertise), understands basic principles and is able to take part in project team discussions
	2 Understands basic knowledge and has practical skills regarding the field/technology; is able to solve simple problems by selecting and applying basic methods, tools, materials, and information (mostly outside of the field of expertise)
	3 Has comprehensive, factual, and theoretical knowledge and skills within the field/technology and is capable of solving standard problems within the field
	4 Has advanced knowledge involving a critical understanding of the theories, principles, and skills required to solve complex and unpredictable problems within the field and is aware of the boundaries of the field
	5 Has specialised knowledge and problem-solving skills, partly regarding the forefront of knowledge in the field, and can develop new knowledge and procedures and to integrate knowledge from different fields
Specialism	A specialism is a technology or the application of several combined technologies to a specific set of tasks.
Task	A task is a piece of work to be done or undertaken.
Taxonomy	A taxonomy defines classes of objects and relations among them.
Training scheme	A training scheme is a scheme for teaching people skills in a field or profession
Trias energetica	Trias energetica is a concept based on 3 steps. First, we need to limit energy demand through energy saving. Second, renewable sources should be used to meet the remaining energy demand. Finally, fossil fuels should be used as a last resort and as efficiently and cleanly as possible.



Annexure: Contact Points

Organisation



Main activities

L'Alliance Ville Emploi is a not-for-profit national French organisation. The members of the organisation are local authorities involved in employment, training, and inclusion policies. Most manage employment houses (maisons de l'emploi), whose main function is to develop shared local strategies with local stakeholders. The aim in doing so is to anticipate the skills and employment challenges involved in environmental transitions.

Contact

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The ASTUS Construction platform aims to gather building efficiency stakeholders and those who promote industrial innovation. The platform serves customers in the building sector, such as architects, constructors, operators, public and private customers, engineering companies and users. ASTUS Construction is a member of the France Innovation.

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Dutch Knowledge Centre for the building and building services sector. ISSO is a not-for-profit organisation, which was founded with the aim of coordinating research and organising knowledge transfer to practitioners in the building and building services sector. The organisation was founded by various professional associations in the sector.

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Huygen Ingenieurs & Adviseurs (HIA) is an SME consulting company based in the Netherlands. The company specialises in building services, building physics, sustainable building, ventilation, acoustics, energy, environment, indoor air quality and fire regulations. It offers consulting and applied scientific research services. HIA's clients include architects; building developers and contractors; energy agencies and local, national and international governments.

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Mostostal Warszawa is a construction company, which is active in all the basic sectors of the construction market. The company specialises in bridges and steel construction, public utility buildings, industrial components, environmental protection

Website:
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projects, roads, and underground constructions. It is a general contractor of investment projects and provides turnkey execution.

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The Regional Innovation Management Center (RIVC), based in Vilnius, is involved in innovation and transfer activities. The organisation complies with best global practices in project management and facilitates transformation in various organisations and sectors of the economy. RIVC works with several business associations, innovation transfer centres, universities, governmental agencies, and companies.

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Lithuanian Builders' Association is responsible for uniting 151 accredited entities related to the building sector. These include companies that specialise in design, construction and building materials. They also include producers; providers of heating systems for buildings; major vocational training, education, and research institutions; and other related entities. The association collaborates with various authorities and public institutions, the Lithuanian Confederation of Industrialists, and other influential associations in the building sector, which aim to influence national and European legislation.

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Instituto Valenciano de la Edificación (IVE) (engl.: Valencia Institute of building) is a research institute, which aims to improve the quality and sustainability of the construction process through R&D in the building sector. The IVE board includes professionals, developers, building contractors and end users. The institute provides a platform for the exchange of ideas, developments, and knowledge in the different fields of construction.

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The Architects' Council of Europe (ACE) represents the architectural profession in Europe. The council is in Brussels. It currently consists of 43 member organisations – the regulatory and professional representative bodies of the European Union (EU) member states and the accession countries, Switzerland and Norway.

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