



## **DELIVERABLE: D10-D2.1**

### **Report on existing BIM professional profiles**

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EN STIMULERING VAN ONDERZOEK OP  
HET GEBIED VAN GEBOUWINSTALLATIES**

**Network for Using BIM to Increase the Energy Performance**

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A. Deliverable Details	
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## 1. Short Description

Despite the European law on public procurements (2014/24/EU) works on BIM have multi-speeds within European countries. The starting point for the definition of BIM professional profiles is the harmonization of different national efforts that have already been made on BIM. This will be done by inventorying, comparing and discussing already available profiles. Within this process the EQF methodology will be used to clearly identify knowledge, skills and competencies and to create common profiles. Those will be used during the first part of the project for the identification of energy related requirements of the four target groups.

As result a set of best practices and needs for harmonization will be published as starting point of WP5.

Partners with previous experiences with BIM will work to collect and harmonize all the effort that have already been made in defining BIM Professional Figures at European level. According to the results obtained they will identify BIM Professional Profiles.

Partners from BUS side will work jointly to support BIM partner with the application of EQF methodology in BIM Professional Figures.

## 2. Research Methodology

The purpose of working package 2.1 is described as: “Harmonization of existing BIM profiles in accordance to EQF methodology”. The following steps have been taken to obtain this harmonization:

### 1. Inventory

- Desk research and harmonization at national level

Each country identifies and harmonizes its own BIM profiles. Each country gathers information about EQF level, working fields, tasks and the necessary competencies for: BIM Manager, BIM Coordinator, BIM Expert, BIM Expert user, BIM Evaluator and BIM Facility manager.

- At national level the partners discuss the harmonized results. The results of this discussion are integrated in the harmonization.

### 2. Comparing

- For each BIM profile (BIM Manager, BIM Coordinator, BIM Expert, BIM Expert user, BIM Evaluator and BIM Facility manager) the harmonized results of each country are compared and integrated in one sheet. The integrated results are shared among the participating countries.
- At European level the harmonized results are discussed in a web-meeting. The results from the discussion are integrated in this report.

The results can be found under D.1

### 3. Already Available Profiles

#### 3.1 Italian Situation

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<b>Source</b>	Bozza UNI 11337-7 11 agosto 2017

In Italy, the standards UNI 11337-7 defines requirements for existing BIM professional figures. It is necessary to start from preliminary identification of the activities of the professional profiles, for the purpose of defining requirements of knowledge, skills and competences of these specific figures.



#### ➤ CDE Manager

<b>EQF</b>	<b>Level 7</b>
<b>Working field</b>	Building management
	Construction management

Data Sharing Environment Manager (CDE Manager) is the figure who works to share data. He works for the organization he belongs to or he is hired for specific project from another partner.

The main purpose of the CDE Manager is to introduce, exchange, manage, link and archive the Information Models with the other data and the relevant organization information. After that, he merges them and, eventually, he digitizes them.

These dynamics are intended to ensure uniqueness, traceability and consistency of the information, as well as the interoperability of the same, even if the data are originated in different applications.

Ultimately, CDE Manager may have the task of validating the same data.

In the evolutionary perspective of a digital ecosystem, the CDE Manager should have the function to increase the effectiveness of the decision-making processes related to Construction Project Management.

TASKS
Work to share data
Introduce, exchange, manage and archive the Information Models
Link, merge and digitalize the Information Models with the other data and the relevant organization information
Validate the data
Increase the effectiveness of the decision-making processes related to Construction Project Management

## ➤ BIM Manager

Working field	Financing and procurement
	Building management
	Construction management

Digitized Process Manager (BIM Manager) supervises and coordinates the portfolio of ongoing orders and for this reason he is related with the Project Manager. He normally also takes care of drafting the Management Information Plan before one or more BIM Coordinators are assigned.

The main purpose of the BIM Manager is to ensure that the digitization of the information is progressively internalized by those who work with them.

Because of the digitization does not only go through modeling and information management, this function has to deal with all the possible applications of the Information Model (such as in the simulation in immersive environment or in the additive manufacturing). For this reason, the BIM Manager must be able to use methods and tools related to Data Science and Data Analytics to evaluate periodically the level of maturity and performance achieved systematically by Organization and within the individual orders.

However, because the BIM Coordinator is related to the demand side, the BIM Manager is be able to follow the supply side, analyzing the Employers Information Requirements and the Information Management Offer. Therefore the BIM Manager is responsible for allocation of the specialized human resources in the different projects.

BIM Manager e BIM Coordinator cooperate with the CDE Manager to transform the Data Sharing Environment into an ecosystem that is capable of combine information processes and processes decision-makers, as well as supporting Business Intelligence.

In addition, the BIM Manager is responsible for defining the periodic training plan, influenced by the internalization or outsourcing policy, and the proposal of annual or multi-year investment in hardware and software, strictly related to the adoption of preventive or corrective actions.

This figure will also be responsible for promoting a Research & Development, as well as to ensure public communication activities in this area promoted by the Organization. In addition to these tasks, he configures a systematic reporting activity and support audit to solve problems which can be found within the management of digitized processes, proposing preventive and corrective actions to the Top Management.

In closing, BIM Manager is the person responsible for editing and updating periodically the Ownership Guidelines for Information Management (BIM Guidelines) and the Digitized Processes of the Organization, which constitute the reference document to promote digital culture and operation within the Organization.

#### TASKS

supervise and coordinates the portfolio of ongoing orders
take care of drafting the Management Information Plan before one or more BIM Coordinators are assigned
ensure that the digitization of the information is progressively internalized by those who work with them
evaluate periodically the level of maturity and performance achieved systematically by Organization and within the individual orders
analyze the Employers Information Requirements and the Information Management Offer and is responsible for allocation of the specialized human resources in the different projects
edit and update periodically the Ownership Guidelines for Information Management (BIM Guidelines) and the Digitized Processes of the Organization
cooperate with the CDE Manager to transform the Data Sharing Environment into an ecosystem that is capable of combine information processes and processes decision-makers, as well as supporting Business Intelligence
is responsible for defining the periodic training plan
is responsible for promoting a Research & Development
configure a systematic reporting activity and support audit to solve problems

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#### ➤ BIM Coordinator

EQF	Level 6
Working field	Financing and procurement
	Building management
	Construction management
	Architecture

The so-called Orders Information Flows Coordinator (BIM Coordinator) operates at the level of the single order to support the BIM Manager in the management of digitized processes. Therefore, he is a guarantor of the efficiency and the efficacy of that processes, operating in relation with the BIM Manager and the project Management (Construction Project manager, Design Manager...). His way of working is different, depending on the type of project (mono-disciplinary or multi-disciplinary). In cases where the contract has high degrees of complexity, the BIM Coordinator can delegate the coordination of singular disciplinary models to collaborators (Deputy BIM Coordinator).

In each case, the BIM Coordinator produces the Employers Information Requirements (or simply details the already existing one from demand side) and the Information Management Plan, making certain of the conformity to them of the singular information models. He also had to configure the workflows of digital data making sure that there is not distorted information. In addition, the BIM Coordinator have to ensure that the data contained in the Information Models are timely transmitted by BIM Library or other sources with a validation process.

Moreover, BIM Coordinator has to identify each interferences and conflicts (of geometrical, dimensional and alpha-numeric nature) during and after the Coordinator Meeting in the BIG Room, making sure that the resolution of the same be done in compliance with the contractual commitments.

In closing, he need to ensure, in general terms, a high quality of interpersonal relationships within organization to which it adheres and to other organizations involved to the project.

#### TASKS

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support the BIM Manager in the management of digitized processes
is a guarantor of the efficiency and the efficacy of that processes
produce the Employers Information Requirements (or simply details the already existing one from demand side) and the Information Management Plan
configure the workflows of digital data making sure that there is not distorted information
ensure that the data contained in the Information Models are timely transmitted by BIM Library or other sources with a validation process
identify each interferences and conflicts (of geometrical, dimensional and alpha-numeric nature) during and after the Coordinator Meeting in the BIG Room
make sure that the resolution of the same be done in compliance with the contractual commitments.
need to ensure, in general terms, a high quality of interpersonal relationships within organization to which it adheres and to other organizations involved to the project

### ➤ BIM Specialist

EQF	Level 6
Working field	Structural engineering
	Building management
	Electrical engineering
	Mechanical Engineering
	Architecture

The Information and Modelling Advanced Operator (BIM Specialist) usually acts within individual orders, collaborating permanently (and sometimes occasionally) with a specific organization. The regularity of collaboration has its relevance, for example, in terms of familiar with diverse digitized procedures or certain BIM Library. Because of that the BIM Specialist can insert the disciplinary knowledge into the operational modeling and into the information management. This allows him to mediate between the different decision makers (for example, Client Project Manager, designers, production managers or worksites) and BIM Modeler (Data Configurators in the Information Model). As a result, the BIM Specialist distinguishes itself from the simple BIM Modeler: the first one is able to translate and transfer specialist skills in digital terms, collaborating actively with the disciplinary specialists (or, better, coinciding with them); the second one only possesses the operational capability of specific applications.

Obviously, the BIM Specialist has to hold, as mentioned, a preparation that allows him to enter his own activities within the digital workflows devised by the BIM Coordinator.

He also has to be endowed with the ability to analyze the main contents of the Employers Information Requirements and of the Informative Management Plan, as well as testing the disciplinary information model.

Finally, he contributes to constitute the BIM Library of the order, assuming the responsibility of the validation of individual items taken from others BIM Library.



#### TASKS

support the BIM Manager in the management of digitized processes
is a guarantor of the efficiency and the efficacy of that processes
produce the Employers Information Requirements (or simply details the already existing one from demand side) and the Information Management Plan
configure the workflows of digital data making sure that there is not distorted information
ensure that the data contained in the Information Models are timely transmitted by BIM Library or other sources with a validation process
identify each interferences and conflicts (of geometrical, dimensional and alpha-numeric nature) during and after the Coordinator Meeting in the BIG Room
make sure that the resolution of the same be done in compliance with the contractual commitments.
need to ensure, in general terms, a high quality of interpersonal relationships within organization to which it adheres and to other organizations involved to the project

As the result of the tasks provided for BIM professional figures, the requirements of the Process Manager are identified and digitized in terms of competences:

CDE MANAGER	BIM MANAGER	BIM COORDINATOR	BIM SPECIALIST
Capability to manage Data Analytics	Capability and qualification of the capabilities to edit and periodically update a Training Plan for the digitization of the organization	Capability and qualification of the capability to contribute to produce and check a Model of current fixed assets	Capability and qualification of the capability to contribute to produce and check a Model of current fixed assets
Capability to validate an application	Capability and qualification of the capabilities to edit and periodically update an Investment Plan for the digitization of the organization	Capability and qualification of the capability to contribute to produce a Disciplinary Information Model	Capability and qualification of the capability to contribute to produce a Disciplinary Information Model
Capability to validate a Data Sharing Environment	Capability and qualification of the capabilities to update a Collaborative Contract	Capability and qualification of the capability to analyze an Employment Information Requirements	Capability and qualification of the capability to analyze an Employment Information Requirements
Capability to validate a Data Protection System	Capability and qualification of the capabilities to edit Audit and Report for the BIM Coordinator	Capability and qualification of the capability to analyze a proposal of Information Management	Capability and qualification of the capability to analyze a proposal of Information Management
Capability to validate data sets	Capability and qualification of the capabilities to use Evaluation Method of Digital Maturity (BIM)	Capability and qualification of the capability to analyze an Information Management Plan	Capability and qualification of the capability to analyze an Information Management Plan
	Capability and qualification of the capabilities to manage controversies focused to digital processes	Capability and qualification of the capability to use the BIM Library of the project	Capability and qualification of the capability to use the BIM Library of the project

### Strengths & Weaknesses



#### Strengths

- In Italy, a strong strength is the presence of advanced regulatory system (UNI 11337-7 which will become a standard presumably by the end of 2017)



#### Weaknesses

- In Italy, a weakness is the presence of fragmented profiles, linked to the use of the different types of design software

### 3.2 Spanish Situation

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<b>Source</b>	<a href="http://www.esbim.es/wp-content/uploads/2017/07/esBIM_Roles_170118.pdf">http://www.esbim.es/wp-content/uploads/2017/07/esBIM_Roles_170118.pdf</a>

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In July 2015 the Ministry of Development in Spain set up the BIM Commission that includes different agents and organizations belonging to both the public and private sectors whose main mission is the implementation of BIM in Spain.

Regarding normalization, there is no UNE regulation dealing with BIM, but the Spanish Association for Normalization (AENOR) has created the sub-committee Aenor.

AEN/CTN 41/SC13 for the normalization of several aspects, but roles and profiles are not included.

In this context, as there is no official criteria or definition of BIM profiles or roles, the profiles identified in the current document are those suggested by the BIM Commission in a recent report (May 2017), which intends to serve as a document for recommendation and guidance, but is not a rule or an imperative.

According to this document, the main roles implied in a BIM project are the following:

- BIM Project Manager
- BIM Information Manager
- BIM Manager
- BIM Lead Designer
- BIM Lead Construction
- BIM Task Team Manager
- BIM Coordinator
- BIM Modeler

The document also mentions other roles, with a lower relevance, who may be or not present in a construction BIM project: BIM Analyst, BIM Software Developer, IFC Specialist, BIM Facilitator, BIM Consultant, BIM Researcher.

For this report, and for the purposes of the project, only the main roles identified are considered.

#### ➤ BIM Project Manager

EQF	Level 7
Working field	Architecture Structural engineering Financing and procurement Construction management Building management

The BIM Project Manager leads the project team, and is responsible for achieving the objectives of the project while meeting the expectations of the client.

#### TASKS

Establishes the criteria for BIM implementation on a strategic level linked to the business model of the company.  
Translates the needs of the client / promoter to generate the BIM Execution Plan (BEP).  
Develop the project management plan, including the scope, budget and schedule.  
Manage and control the quality, risks, changes, costs and schedule of the project  
Select, create and lead the project team  
Identify and evaluate project stakeholders

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#### ➤ BIM Information Manager

EQF	Level 6
Working field	Construction management Building management Financing and procurement

The BIM Information Manager takes part of the BIM Manager team, and is responsible for managing and structuring the information among the participants of the project.

#### TASKS

Define processes for information exchange among stakeholders and finalize the format work.  
Create and manage the Common Data Environment

#### ➤ BIM Manager

EQF	Level 6
Working field	Architecture Structural engineering Construction management Building management

Manages the BIM project implementation, ensuring compliance with all the criteria defined in the BEP.

#### TASKS

Coordinates operations among participating disciplines and establishes quality controls. Facilitate the collaborative work of the project. To establish compliance with the Employer Information Requirements within Common Data Environment, to manage the creation of the model, its quality and development (change management) and to ensure interoperability between platforms and tools. Definition of the BIM Execution Plan.

#### ➤ BIM lead Designer

EQF	Level 5
Working field	Architecture Structural engineering Mechanical Engineering Electrical engineering

The BIM Lead Designer establishes communications between the design teams among themselves and with the team responsible for the execution team (construction).

#### TASKS

Confirm and approve design results.

#### ➤ BIM Lead Construction

EQF	Level 5
Working field	Architecture Structural engineering Mechanical Engineering Electrical engineering Construction management

The BIM Lead construction is the person in charge of managing the execution of the project.

#### TASKS

Approves the documentation for the coordination of the execution and confirms the results of the same. Together with the BIM Lead Designer, it is the communication link between design teams and execution teams.

➤ **BIM Task Team Manager**

EQF	Level 5
<b>Working field</b>	Architecture Structural engineering Mechanical Engineering Electrical engineering

The BIM Task Team Manager is responsible for the production of the design and all the elements that relate to that task.

**TASKS**

Leading the production teams of the works based on disciplines (architecture, structure, facilities, etc. ...).

➤ **BIM Coordinator**

EQF	Level 6
<b>Working field</b>	Architecture Structural engineering Mechanical Engineering Electrical engineering Building management

The BIM Coordinator is responsible for coordinating work within the same discipline in order to meet the requirements of BIM Manager.

**TASKS**

Responsible for publishing models of its specialty in the common workspace.  
Performs the quality audits of the model of its specialty and ensures its compatibility with all other disciplines.  
Coordinate the development of the model within its specialty. In a project there will be as many BIM coordinators as specialties include the project (architecture, structure, MEP, sustainability, safety and health ...).

➤ **BIM Modeler**

EQF	Level 4
<b>Working field</b>	Architecture Structural engineering Mechanical Engineering Electrical engineering

The BIM Modeller is the responsible for the modelling according to the established in the BIM Execution Plan.

**TASKS**

Develop the models according to the design criteria and structure the information they must contain  
To create, develop and to extract documentation from Models.

As the result of the tasks provided for BIM professional profiles, the requirements of these profiles are identified and digitized in terms of competences:

<b>BIM Project Manager</b>	<b>BIM Information Manager</b>	<b>BIM Manager</b>	<b>BIM Lead Designer</b>
Leadership Technical skills Communication skills Negotiation Effective decision-making Qualifications Skill/Ability Attitude Organization & prioritization Risk control Problem solving	Leadership Technical skills Communication skills Negotiation Effective decision-making Qualifications Skill/Ability Attitude Organization & prioritization Problem solving	Leadership Technical skills Communication skills Effective decision-making Qualifications Skill/Ability Organization & prioritization Problem solving	Leadership Technical skills Communication skills Organization & prioritization Problem solving
<b>BIM Lead Construction</b>	BIM Task Team Manager	BIM Coordinator	BIM Modeller
Leadership Technical skills Communication skills Organization and Prioritization Problem solving	Leadership Technical skills Communication skills	Leadership Technical skills Communication skills Organization and Prioritization Problem solving	Technical skills

## Strengths & Weaknesses

### Strengths

Creation in 2015 of the National BIM Commission ([www.esbim.es](http://www.esbim.es)) which is working hard to introduce BIM in the construction sector and studies how to introduce it in Public tenders, since it will be compulsory in 2018.

The Association buildingSMART Spanish Chapter has developed a series of BIM guides (uBIM) that intend to facilitate the introduction of the BIM methodology in the Spanish sector.

Standardisation: the methodology openBIM is based on the use of open standards, such as IFC, that serves as a format to exchange data among agents, processes and applications, as defined by the rule ISO 16739:2013.

### Weaknesses

BIM always will imply a change; this may be particularly difficult to achieve in small and medium companies.

Difficulty to establish common national profiles due to the high number of potential roles that may participate in one single project.



### 3.3 Slovak Situation

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<b>Source</b>	

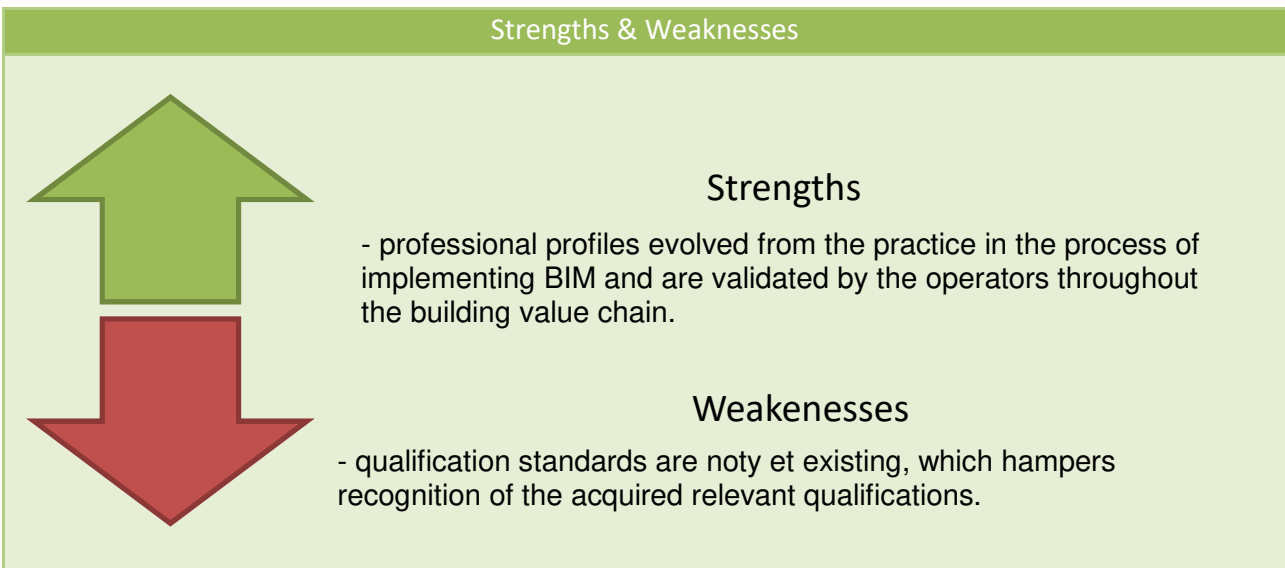
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In Slovakia, there are currently no official qualification profiles or standards included in the Slovak National Qualification Framework (NQF) that is linked to the European Qualification Framework (EQF).

Slovak Chamber of Civil Engineers (SKSI) is currently coordinating a H2020 ingREeS project that is aimed at setting up qualification and further training scheme for middle and senior level construction professionals. This scheme is delivering further education and training on energy efficiency and use of renewable energy sources in buildings.

The training programs include a module on BIM that is specifying the different professions relevant to BIM implementation and their main tasks. From the outcome of the work on BIM within this project the following professional profiles are considered as essential for implementing BIM in Slovakia:

BIM Coordinator	BIM Specialist							BIM Expert	BIM Manager
	BIM Interior Architect	BIM Architect	BIM MEP-Structure Engineer	BIM Project Manager	BIM Construction engineer	BIM Bioclimatic Designer	BIM FM Facility Manager		
									BIM Systems implementation
								IT Management	IT Management
								BIM Style Guide	BIM Style Guide
								BIM Object Development	BIM Object Development
								BIM Libraries Management	BIM Libraries Management
								MEP- Struct. Inter-operability	MEP- Struct. Inter-operability
								4D, 5D, 6D, 7D inter-operability	4D, 5D, 6D, 7D inter-operability
								Clash detection	Clash detection
								Model Documenta-tion	Model Documenta-tion
	Advance Modelling	Advance Modelling	MEP- Struct. Inter-operability	4D, 5D, 6D, 7D inter-operability	4D, 5D, 6D, 7D inter-operability	4D, 5D, 6D, 7D inter-operability	Asset management	Advance Modelling	Advance Modelling
Collaborative teamwork	Collaborative teamwork	Collaborative teamwork	Collaborative teamwork	Collaborative teamwork	Collaborative teamwork	Collaborative teamwork	Collaborative teamwork	Collaborative teamwork	Collaborative teamwork
Digital Model	Digital Model	Digital Model	Digital Model	Digital Model	Digital Model	Digital Model	Digital Model	Digital Model	Digital Model



### 3.4 Lithuanian Situation

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<b>Source</b>	<p>1. BIM VADOVAS. KOMPETENCIJŲ APRAŠAS. Dokumento versija: SKST_S4_P01_170904, 2017 m. rugsėjis, Viešojo įstaiga „Skaitmeninė statyba“, BIM dokumentai <a href="http://skaitmeninestatyba.lt/bim-dokumentai/265-bim-kompetenciju-aprasai">http://skaitmeninestatyba.lt/bim-dokumentai/265-bim-kompetenciju-aprasai</a></p> <p>2. BIM KOORDINATORIUS. KOMPETENCIJŲ APRAŠAS. Dokumento versija: SKST_S4_P01_170830, 2017 m. rugpjūtis, Viešojo įstaiga „Skaitmeninė statyba“, BIM dokumentai, <a href="http://skaitmeninestatyba.lt/bim-dokumentai/265-bim-kompetenciju-aprasai">http://skaitmeninestatyba.lt/bim-dokumentai/265-bim-kompetenciju-aprasai</a></p> <p>BIM SPECIALISTAS. KOMPETENCIJŲ APRAŠAS. Dokumento versija: SKST_S4_P01_170904, 2017 m. rugsėjis, Viešojo įstaiga „Skaitmeninė statyba“, BIM dokumentai, <a href="http://skaitmeninestatyba.lt/bim-dokumentai/265-bim-kompetenciju-aprasai">http://skaitmeninestatyba.lt/bim-dokumentai/265-bim-kompetenciju-aprasai</a></p>

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In Lithuania, currently there is **no national standard**, which defines requirements for existing BIM professional profiles. However, Digital Construction – the BIM coordination body at national level for voluntary application have issued the competency descriptions for BIM manager, BIM Co-coordinator and BIM Specialist.



#### ➤ BIM Manager

<b>EQF</b>	<b>Level 7</b>
<b>Working field</b>	Project Management
	Construction management
	Building management
	Facility management
	Financing and procurement
	All Infrastructure networks

The highest level BIM specialist who solves the strategic issues of BIM application policy and methodology in a company and / or construction project, sets up BIM goals and targets, develops and implements BIM standards and requirements, forecasts BIM development and related processes, develops and implements professional development strategy of participants of BIM processes, carries out expert works on the

construction projects digitization, provides consultations on digitization of the company and/or construction project and on questions of digital coordination, performs best practice analyses and research in the BIM sphere.

#### TASKS

to prepare strategic plans for the implementation of the BIM (digitization) in the company and/or the construction project
to determine the BIM (digitization) goals and objectives of the company and/or the construction project
to develop and implement BIM standards and requirements in the company and/or construction project
to supervise implementation of the conception of the company and/or the construction project BIM (digitization) and the individual processes
to organize and manage the expertise of the digital (BIM) content of the construction project
to assess the quality of the digital (BIM) content of the construction project, to prepare and sign expert report on the digital (BIM) content
to provide consultations to the construction market participants on digitization and digital coordination and other implementation of BIM methodology in the construction industry, enterprises and/or construction projects
to organize and provide training to the construction market participants on digitization and digital coordination and other implementation of BIM methodology in the construction industry, enterprises and/or construction projects
to carry out best practice analyses and research in the field of BIM, prepare feasibility studies and other analytical materials, provide expert conclusions and recommendations

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D10-D2.1 Report on existing BIM professional profiles

#### ➤ BIM Coordinator

EQF	Level 7
Working field	Project Management (Design stage)
	Construction Management (Construction stage)
	Facility management
	Architecture
	Structural engineering

A high-level BIM specialist who implements and coordinates the digitization of the content of the construction project and information modeling. Ensures a smooth implementation of the integrated project development, the monitoring, coordination of the activities, training and professional development of the construction project participants, in relation to digitization and application of BIM technologies.

#### TASKS

to set up and coordinate the goals and scope of the digitization of the construction project
to prepare the BIM Project Execution Plan (BEP) and other (project) BIM documents
to advise the project team in preparing an integrated development plan of the project using BIM
ensures the timely accumulation, storage, sharing and exchange of construction project data related to BIM between the project participants
to carry out the organization and control of information management processes
to ensure interoperability between the individual parts of the BIM model and the quality of the results
to provide information to the client on the development of the BIM
to organize the preparation of the BIM operational model and presents it to the builder
to plan and, within the limits of responsibility, organizes trainings of construction project participants in the field of BIM competencies

➤ **BIM Specialist**

EQF	Level 6
<b>Working field</b>	Architecture
	Structural engineering
	Mechanical Engineering
	Electrical engineering
	Plumbing engineering

Subject area BIM Specialist performs digital (information) modeling of buildings in the scope of the subject and exchanges the data (information) with representatives of other areas; generates results from the BIM model according to the BIM application area and prepares project documentation from a digital (information) model.

TASKS
to carry out digital (information) modeling of buildings in the scope of the subject area
to carry the data (information) exchange with representatives of other subject areas and uses this data (information) for the development of integrated model in the scope of their subject area
from the BIM model to generate the required results by subject area of BIM application cases

As the result of the tasks provided for BIM professional profiles, the requirements of these profiles are identified and digitized in terms of competences:

BIM MANAGER	BIM COORDINATOR	BIM SPECIALIST
Capability and qualification of the development and implementation of the BIM strategy for the company and projects	Capability and qualification of the digitization of the construction project content	Capability and qualification of the digital simulation. *
Capability and qualification of the Risk and Quality Management	Capability and qualification of the digital coordination of the construction project	Capability and qualification of the design documentation preparation from a digital (information) model
Capability and qualification of the implementation of BIM processes and technologies	Capability and qualification of the quality Assessment of BIM Model	Capability and qualification of the
Capability and qualification of the expert activity in the field of BIM	Capability and qualification of the BIM IT infrastructure and BIM software knowledge, selection and setup management	Capability and qualification of the
Capability and qualification of the consulting and training in the field of BIM	Capability and qualification of the BIM team training	Capability and qualification of the
Capability and qualification of the research in the field of BIM	Capability and qualification of the professional development	Capability and qualification of the

## Strengths & Weaknesses

### Strengths

- On September 28, 2015 The Government of the Republic of Lithuania officially recognized the initiative for the digitization of the Lithuanian construction sector.
- On November 3, 2015 The Ministry of Environment approved a working group for the implementation of the Lithuanian construction sector digitization initiative.

• The digitization processes of construction in Lithuania are coordinated by one institution (Public Institution "Digital Construction"). This ensures the creation of a unified BIM methodology and the balanced management of BIM development processes.

On May of 2015 Public institution "Skaitmeninė statyba" was approved as an observer in buildingSMART Nordic

- Digital Construction is preparing to carry out the assessment of BIM specialists' competences in Lithuania. The aim is to ensure that the certificates of competences issued by Digital Construction are recognized in other countries as well.
- Lithuanian Builders Association implements the project (STATREG) to launch national Digital Construction Workers Competencies Register aimed to collect and provide information regarding the qualifications and skills, trainings, qualifications development opportunities, and the certification process for workers. Register will include employee's Digital CV's.
- Participants in the construction sector (companies, associations) are benevolent and active in the implementation of Digital Construction in Lithuania. Every year in Lithuania a competition for the best BIM project takes place.

### Weaknesses

- In Lithuania, there are still no legal requirements for BIM processes and BIM competencies. So far, only two ISO standards have been adapted in Lithuania: LST ISO 29481-2:2017 "Building information models – Information delivery manual – Part 2: Interaction framework" and LST ISO/TS 12911:2015 "Framework for building information modelling (BIM) guidance".
- Construction digitization takes place at the expense of private initiatives. Although, even as "digital construction" is included in the list of priority research and innovation areas called "Smart Specialization" as a strategy for state support to research and innovation, there is no significant support from the state. Since the preparation of the strategy in 2012 the institution coordinating the digitization of construction in Lithuania did not receive support to BIM related research from the national funds.

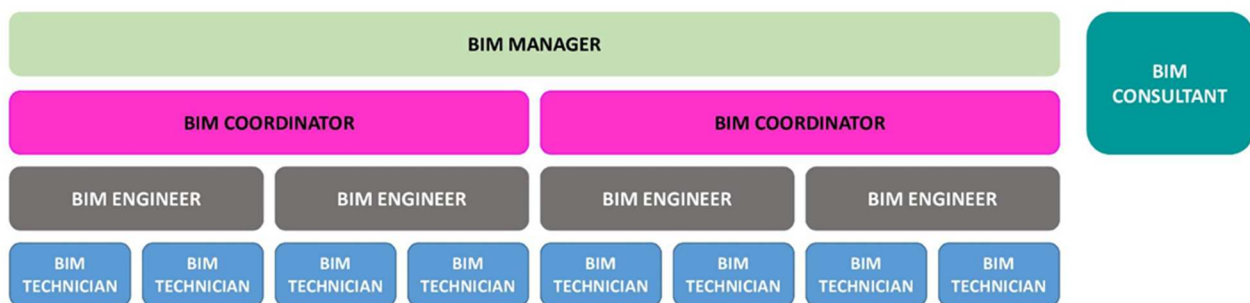


### 3.5 Croatian Situation

Contributed by	FCE – Croatia
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<b>Source</b>	"General guidelines for BIM approach in civil engineering" published by Croatian Chamber of Civil Engineers in June 2017 ( <a href="http://www.hkig.hr/fdsak3jnFsk1Kfa/izdvojeno/HKIG-BIM.pdf">http://www.hkig.hr/fdsak3jnFsk1Kfa/izdvojeno/HKIG-BIM.pdf</a> )

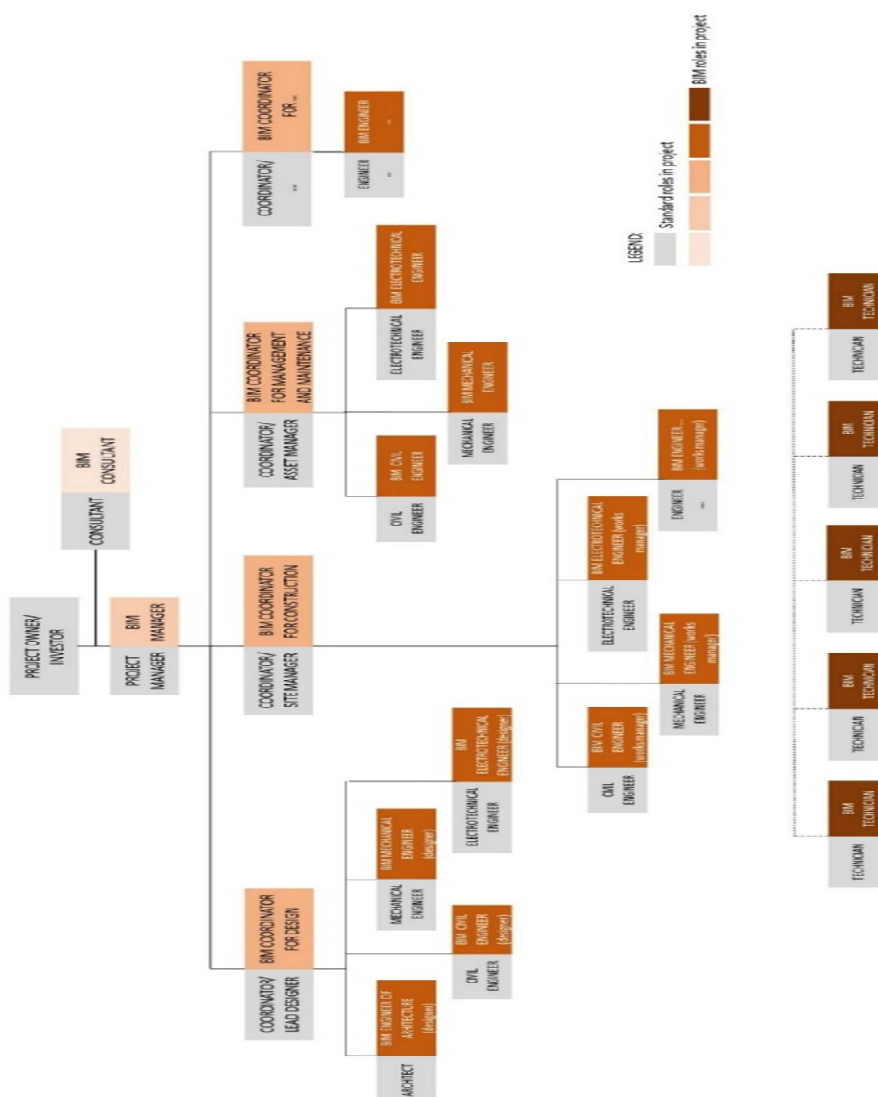
In Croatia, currently there is **no national standard** that defines requirements for existing BIM professional profiles. BIM professional profiles with their tasks and competencies in BIM projects are covered, i.e. scarcely defined in "General guidelines for BIM approach in civil engineering" published by Croatian Chamber of Civil Engineers in June 2017. As its name says, those guidelines are quite general and do not elaborate BIM professional profiles in detail.

Figure 1 shows hierarchical organizational structure of BIM roles/responsibilities.



**Figure 1.** Hierarchical organizational structure of BIM roles/responsibilities

By implementing BIM approach, new processes requiring new project roles/tasks and responsibilities are being driven. Croatian Chamber of Civil Engineers has proposed the assignment of corresponding roles in BIM projects in relation to the standard roles in construction projects (see Figure 2).



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## D10-D2.1 Report on existing BIM professional profiles

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<b>Working field</b>	Construction management
	Financing and procurement
	Building management

BIM Consultant leads and consults stakeholders of construction project that will or currently are in phase of adopting BIM approach in their project but they don't have experienced BIM experts in team.

There are three types of BIM Consultant:

1. **Strategic Consultant** - generates strategies that are typically medium to long term and are based on a vision of achievement;
2. **Functional Consultant** - generates action plans in accordance with these strategies;
3. **Operational Consultant** - consults in process of BIM implementation

<b>TASKS</b>
Leads and consults stakeholders of construction project (designers, contractors, investors, project managers, supervision engineers, developers, etc.) that will or currently are in phase of adopting BIM approach in their project but they don't have experienced BIM experts in team.

#### ➤ BIM Manager

<b>EQF</b>	Level 7
<b>Working field</b>	Construction management
	Financing and procurement
	Building management

When the BIM project is being considered, it is necessary to name a person who defines BIM goals and requirements of the project, moreover who collects and manages project information. This role can be carried out by an independent party working for the investor/ project owner, e.g. project manager; or by the project's independent party, e.g. the main/ lead designer.

The role of BIM Manager is to set up the rules that need to be followed during the lifetime of construction project - from initiation/planning through constructing to handing over the building. He ensures that exchange of information among project parties is in accordance with Contractual rules.

For BIM Manager to be able to manage and perform his tasks, it is desirable to have experience in construction industry and to be familiar with BIM software tools.

<b>TASKS</b>
Defines BIM goals and requirements for the project; collects project information and manage them.
Sets up the rules that need to be followed during the lifetime of construction project - from initiation/planning through constructing to handing over the building.
Ensures that the information being exchanged among project parties is in accordance with the Contractual rules in the context of: a) content (e.g. amount of information); b) form (e.g. file type, communication through E-mail or Cloud service); c) time (timeliness of information and BIM tasks in accordance with time plan of project); d) ownership, privacy and security questions.

Determination of different development levels of the model in accordance with the development phases of the project.
Defining the frequency of updating and coordinating the model with the project parties.
Defining the process of information exchange with regard to the use of software platform and project tools from different project stakeholders and other parties.
Informing the project stakeholders about the needs and requirements of other parties.
Organization of coordination meetings.
Assessment and optimization of collaboration and information exchange to prevent the loss of information.

## ➤ BIM Coordinator

<b>EQF</b>	Level 7
<b>Working field</b>	Architecture
	Structural engineering
	Mechanical engineering
	Electrical engineering
	Construction management

In hierarchy of BIM projects, next to the BIM Manager there is a BIM Coordinator for each specific profession or a narrower area of profession, i.e. technical and/or architectural elements such as architectural shaping, load-bearing structure, electrical installations, etc. BIM Coordinator is a direct link between BIM Manager and other stakeholders involved in project. He is an expert for information management and modelling by using the specific software tools that are also being used by other project parties under his coordination. Moreover, BIM Coordinator knows which information (and in what format) he needs to collect from other project stakeholders in order to deliver what is required and agreed in BIM protocol of specific projects, i.e. specific professions.

<b>TASKS</b>
Provide technical leadership for data management and modelling using specific softwares that are being used by parties under his governance.
Interface directly with stakeholders of project and other parties to collect required and valid data; thereby to assure the quality delivery of collaborative digital deliverables as agreed in BIM protocol of specific projects (specific professions).

## ➤ BIM Engineer

<b>EQF</b>	Level 7
<b>Working field</b>	Architecture
	Structural engineering
	Mechanical engineering

	Electrical engineering
	Construction management

BIM Engineer usually uses appropriate BIM software tools to develop his part of BIM project. By using BIM software tools, he is developing model and technical documentation.

This role can be carried out by highly educated professional, e.g. with Master degree, with few years of professional work experience.

TASKS
Uses appropriate BIM softwares for developing his part of BIM project. By that, he develops whole BIM model and technical documentation.
Manage and coordinate project deliveries. Define tasks together with project team.
Learn and demonstrate proficiency in softwares related to BIM.
Learn and demonstrate proficiency in construction trade knowledge.
Strive to build strong network connections with project stakeholders.
Working on BIM 3D models, 2D shop drawings, as-built models.

#### ➤ BIM Technician/ Modeler

EQF	Level 5, 6 or 7
Working field	Architecture
	Structural engineering
	Mechanical engineering
	Electrical engineering

BIM Technician/ Modeler is an expert with developed modelling skills for BIM software tools and solid understanding of specific design professions. BIM Technician models technical and/or functional elements using BIM software tools, whereby he must be well-versed and understand the project aspects of the specific profession.

This role can be carried out by a professional with vocational education and few years of professional work experience or with recently gained Master degree with no or little work experience.

TASKS
Modelling of individual technical and/or functional assemblies in BIM softwares, where he must be well-versed and understand the project aspects of the specific profession.
BIM modeling for specific design profession in project.
Working under direction of BIM engineer and BIM coordinator.
Ensure accuracy of model and output documentation.
Collaborate and coordinate with other professions during project changes.
Follow accepted BIM content standard.
Prepare drawing print settings for project team and participate in project review.
Export documents in format needed for internal and external project communication.

As the result of the tasks provided for BIM professional profiles, the requirements of these profiles are identified and digitized in terms of competences:

BIM CONSULTANT	BIM MANAGER	BIM COORDINATOR	BIM ENGINEER	BIM TECHNICIAN/ MODELER
Capability to lead.	Capability to make decisions.	Capability to apply knowledge of BIM standards.	Capable of adapting to different working environments.	Capability to use BIM software tools for modelling at advanced level with solid understanding of specific design profession.
Capability to communicate effectively.	Capability to communicate well.	Capability to update knowledge of BIM development.	Capability to update knowledge of BIM development.	Capability to apply technical skills and knowledge.
Capability to understand processes.	Capability to update knowledge of BIM development.	Capability to lead.	Capability to apply knowledge of BIM standards.	Capability to understand working environment of another profession.
	Capability to apply BIM fluently.	Capability to apply modelling skills.	Capability to apply modelling skills.	Capability to communicate and collaborate.
	Capability to apply technical skills and knowledge.	Capability to collaborate and coordinate.	Capability to apply technical skills and knowledge.	
	Capability to lead.	Capability to apply technical skills and knowledge.	Capability to work in a team.	
	Capability to collaborate and coordinate.		Capability to communicate and collaborate.	
	Capability to be BIM goal oriented.			
	Capability to provide discipline essential for project quality and success.			

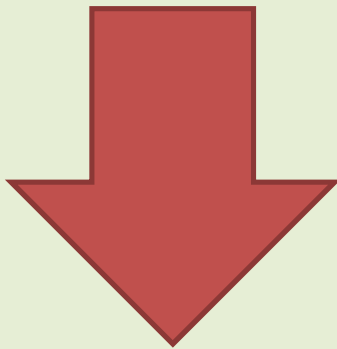
## Strengths & Weaknesses

### Strengths



- In Croatia, Faculties and Universities are developing lectures, which implements BIM in education (i.e civil engineering faculties) and in some courses (i.e planning and designing of construction projects) few BIM software programmes are used, so it could be stated that BIM is more and more present in education system which can drive other stakeholder to implement BIM concept
- In Croatia, a potential strength is that Croatian Chamber of Civil Engineers has recognised the necessity to develop Guidelines for BIM. Additionally, Croatian Chamber of Architects is currently in progress of developing their own guidelines for BIM approach. Hopefully, those guidelines will focus more deeply on BIM professional profiles, i.e. define them more precisely (their tasks and set of competences).
- Ministry of Construction and Physical planning has developed interest to be involved in activities regarding BIM at the EU level.

### Weaknesses



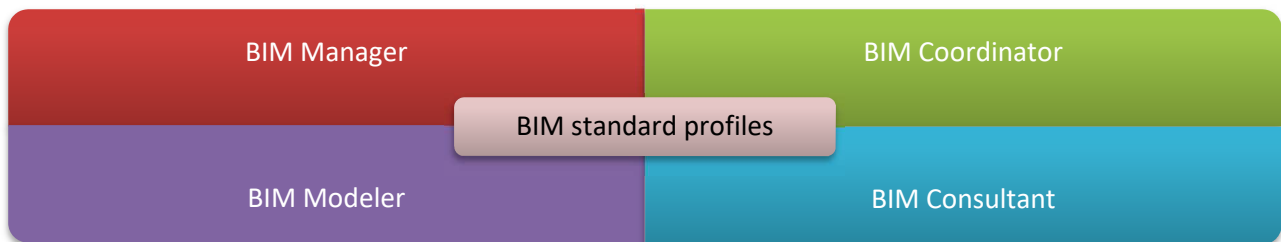
- In Croatia, a weakness is the absence of advanced regulatory system and/or standard regarding BIM professional profiles involved in construction processes.
- Potential weakness is that future BIM guidelines from Croatian Chamber of Architects together with existing BIM guidelines from Croatian Chamber of Civil Engineers will result with unharmonization and potential confusion in construction sector.
- Potential weakness is the inertia of public authorities (and to some extent other stakeholders) to change their business as usual thinking and accept BIM in their regular processes.

### 3.6 Dutch Situation

Contributed by	Netherlands
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<b>Source</b>	Different sources used.

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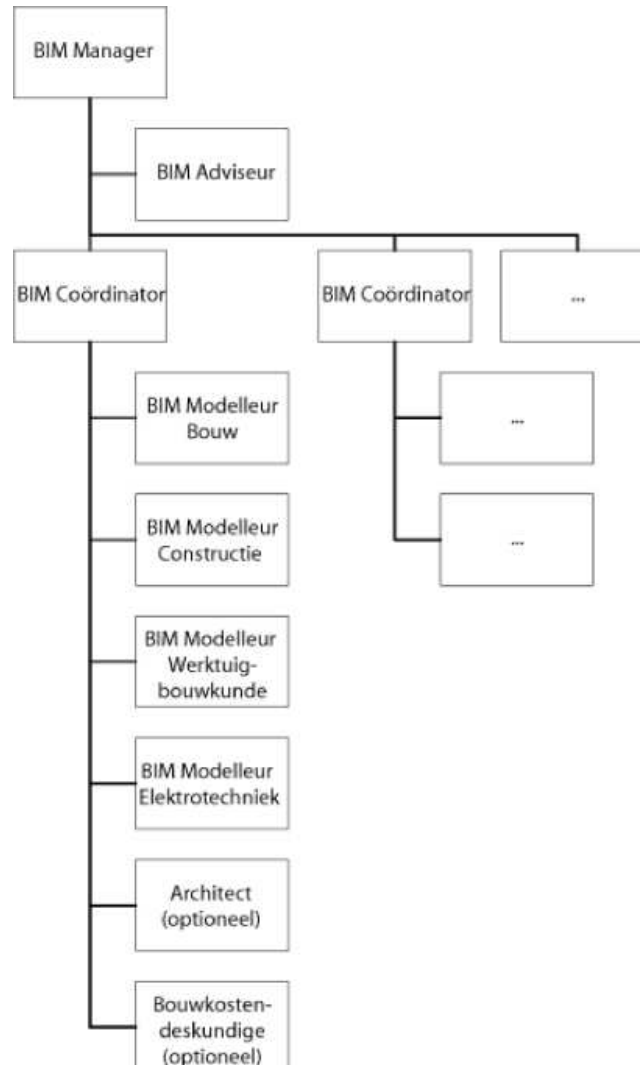
In the Netherlands there are no definitive standards which are incorporated in law or regulations. Standards are market driven. There are some not for profit organizations where building companies, facility organizations, consultants, law makers and clients are represented. They are trying to define the BIM standards. Despite the lack of regulated standards there are trends visible in BIM profiles. These profiles are visualized in the following figure.



#### ➤ BIM Manager

<b>EQF</b>	<b>7</b>
<b>Working field</b>	Mechanical Engineering
	Electrical engineering
	Architecture
	Construction management
	Building management
	Financing and procurement
	Structural engineering

The responsibilities of the BIM manager are twofold. The responsibilities are divided by level. First there are responsibilities related to the organizational level. Second, there are some related to the project level. The BIM manager implements BIM within its organization. Furthermore, the BIM manager implements BIM in new projects. The BIM manager can originate from different working fields. The BIM manager distinguishes oneself by one's leadership and communication skills. In the Netherlands the BIM manager is mostly found in large construction companies. The exact tasks differ between organizations. The tasks mentioned below are a summary of similar tasks between companies, in other words, this is the common ground. In projects there is a hierarchical relationship between the BIM manager and BIM Coordinator and BIM modelers. The most common hierarchy is illustrated in the figure below.



#### TASKS

- Responsible for implementation BIM in projects.
- Responsible for standardization BIM in projects.
- Responsible for structure and implementation of BIM in organizations.
- Responsible for creating overview BIM related activities in projects.

#### COMPETENCES

- Leadership skills
- Overview
- Communication skills
- Analytical skills
- Knowledge and insight in building life cycle
- Strategic skills
- Experience in construction projects
- Project and organisation skills

#### ➤ BIM Coordinator

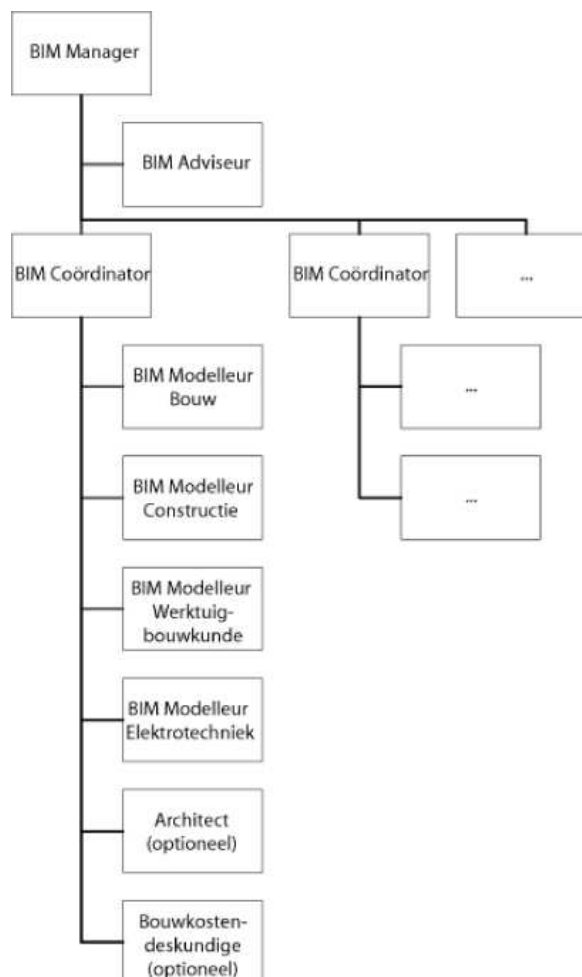
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research and innovation programme  
under grant agreement No.754016



EQF	7
Working field	Mechanical Engineering
	Electrical engineering
	Architecture
	Construction engineering
	Structural engineering

The responsibilities of the BIM coordinator are mostly related to a project and are only for a small part related to the organizational level. This last part includes implementing BIM standards in the organization and mentor new BIM modelers. The responsibilities related to the project level are by coordinating BIM models and BIM modeling activities. The BIM coordinator has usually a strong technical background and has strong communication skills, between parties and within its own organization. The BIM coordinator is mostly found in large organizations with multiple technical disciplines. Also, the BIM coordinator is found in larger projects which covers multiple disciplines. In projects the BIM coordinator is hierarchically placed between the BIM manager and the BIM modeler, as illustrated in the figure below.



## TASKS



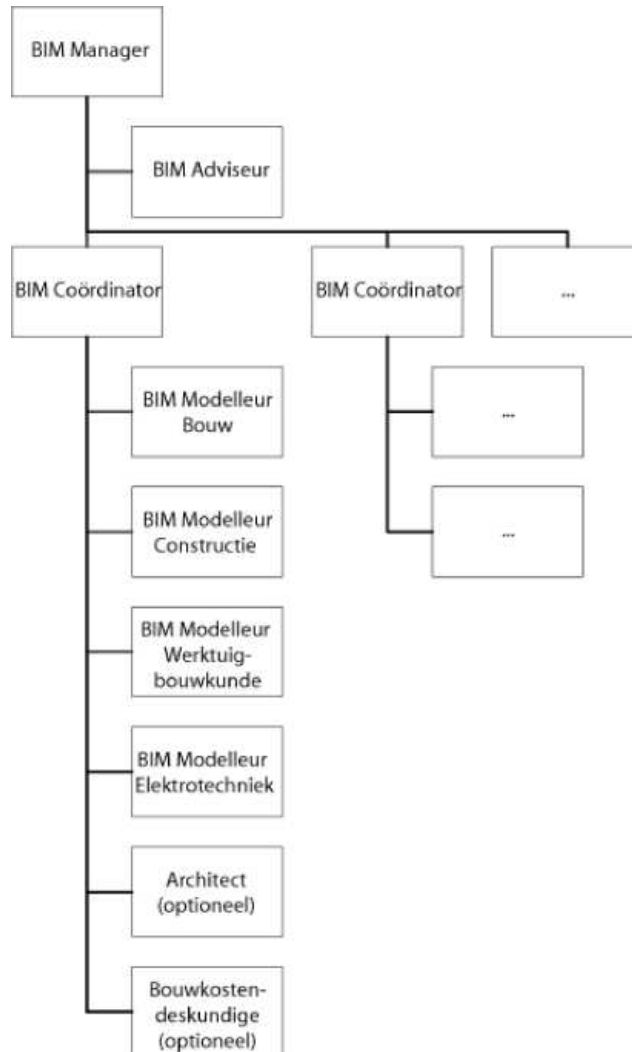
Coordinating technical disciplines
Integrating different BIM models (aspect models) in one integrated model
Organizing cooperation between parties
Quality assessment models and integrated model
Implementation BIM in organization and project.
Mentoring BIM modellers.
Communicating with external parties
<b>COMPETENCES</b>
To be able to gain overview in a project
Analytical skills
Communication skills
Accurate
Collaborating skills
Leadership skills
Engineering skills
To be able to integrate models

#### ➤ BIM modeler

<b>EQF</b>	<b>6</b>
<b>Working field</b>	Mechanical Engineering
	Electrical engineering
	Architecture
	Construction engineering
	Structural engineering

The responsibilities of the BIM modeler are mostly related to a project. The modeler is responsible for the design of a BIM model in a specific working field. Less common, however also feasible, is a BIM model with more than one discipline. The BIM modeler has strong technical and analytical skills. In most organizations there is little discussion about the tasks and competencies of the BIM modeler. The necessary skills of a BIM modeler in different organizations are mostly similar. There is also a stronger emphasis found on communication skills which are necessary when discussing other models. Organizations which have incorporated BIM activities have almost always employed BIM modelers. There is no difference in the size of the organization.

In large projects the BIM modeler is hierarchical placed as follows:



#### TASKS

Modeling  
Implementation BIM in organization  
Consult implementation BIM in projects or organization  
Maintaining contact internal and external organizations

#### COMPETENCES

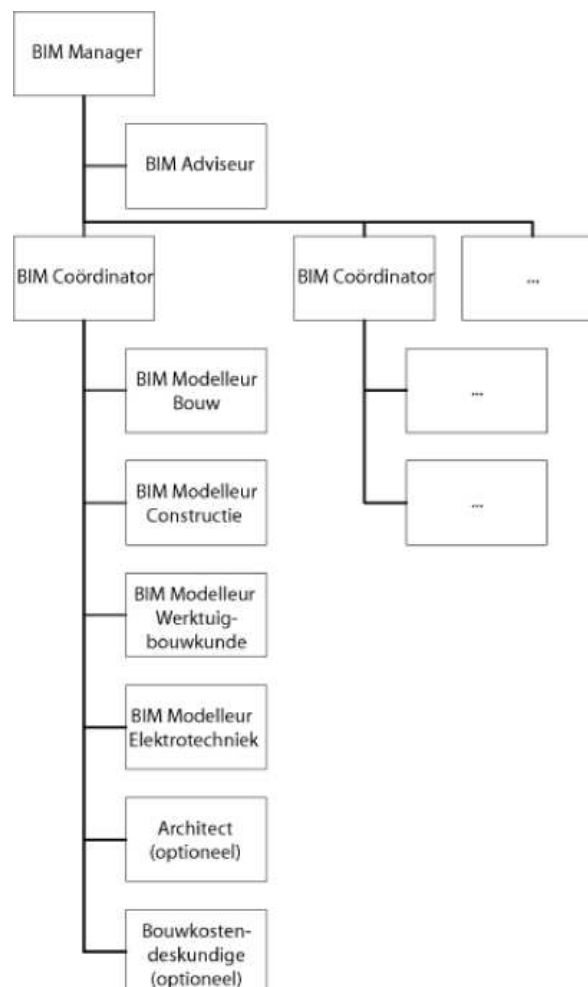
Technical skills  
Analytical skills  
Communication skills  
Creative skills

➤ **BIM consultant**

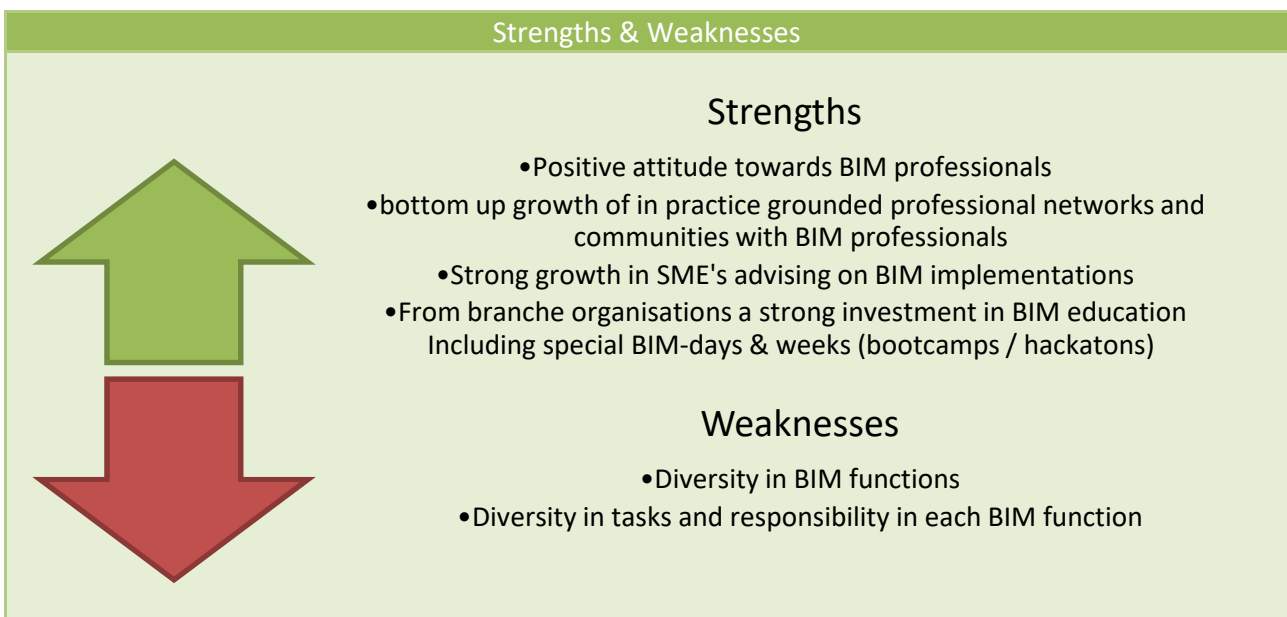
EQF	7
Working field	Mechanical Engineering
	Electrical engineering
	Architecture
	Construction engineering
	Structural engineering

A BIM consultant is responsible for consulting specifically on BIM implementation in projects and organizations. The BIM consultant is mostly present at large organizations or large construction projects. The BIM consultant has experience in change management projects. Next to the BIM manager, BIM coordinator and BIM modeler this profile is not widely available. Also the definition and tasks of this profile differ in organizations. The commonly found tasks and competencies are found in the tables below.

In large projects the BIM consultant is hierarchically placed as follows:



TASKS
Consulting tasks with respect to BIM implementation in organizations and projects.
Maintaining contact between stakeholder within its organization and between organizations.
COMPETENCES
Analytical skills
Communication skills
Creative skills



### 3.7 Estonian Situation

Contributed by	Estonia
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<b>Source</b>	EVS 928:2016 Building Information Modelling (BIM) terminology

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In Estonia, besides EVS 928:2016 BIM terminology, there is no other standard or legislative document that specifies the BIM functions and roles together with specific knowledge and skills. Besides EVS 928:2016 BIM terminology standard does describe three roles, but rather very laconically. The figure below summarizes skills and knowledge domains relevant in specific roles related to specific function. In general, there are three specific functions, including strategic management, general management and production. Strategic is concerned with high level and long-term goals setting and achieving. Although management applies also in organization setting, it is rather project specific function. Finally, production functions is where BIM is implemented for the purpose of producing disciplinary designs and solutions. The BIM roles relevant include BIM manager, BIM coordinator and BIM modelling / authoring specialist. It must be kept in mind that there is no specific context or situation within what one or the other function needs to be represented. For example, it is typical to have BIM managers in large AEC organizations, dealing with organization wide questions and aspects. However, you might have very large projects, where you have a separate function for BIM management, coordination and authoring. Furthermore, in some instances, some roles are combined. Thus, it is not straightforward to distinguish between domains.

Another, not directly relevant in this context but important for BIM diffusion in general is the enactment of the General Public Procurement law, based on the new EU public procurement directive, that establishes rules for communication between customer and supplier. As one topic, law states that public customer can demand using commonly used exchange formats for information exchange, and as part of it, IFC has been established as a primary exchange format.

	Strategic						Management				Production	
Role	Corporate Objectives	Research	Process + Workflow	Standards	Implementation	Training	Execution Plan	Model Audit	Model Co-ordination	Content Creation	Modelling	Drawings Production
<b>BIM Management</b>	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N
<b>Coordination</b>	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N
<b>Modelling / authoring</b>	N	N	N	N	N	N	N	N	N	Y	Y	Y

### ➤ BIM Manager

A person who's role is to understand how BIM affects project workflows and project management throughout the firm. With this understanding the BIM manager will help the firm develop and implement new company procedures in regards to BIM workflow. BIM manager shapes and executes company's BIM strategy.

Working field	Construction Management
	Architecture
	Engineering (structural, mechanical, electrical)
	Building Management

### ➤ BIM Coordinator

A person who performs an intermediary role between the BIM manager and the modelling team. He/she implements the BIM manager's modelling standards and protocols and deals with the coordination of team members to achieve project goals.

Working field	Construction Management
	Architecture
	Engineering (structural, mechanical, electrical)
	Building Management

### ➤ BIM Modeller

BIM technician's/modeller's job is to create models and prepare project documentation, according to required information of the project approved by the BIM coordinator and the client. Work should be based on laws, standards and information requirements. BIM technician's/modeller's work is coordinated by BIM coordinators.

Working field	Construction Management
	Architecture
	Engineering (structural, mechanical, electrical)
	Building Management

## Strengths & Weaknesses

### Strengths



Basic BIM education in all major AEC universities  
New Public Procurement Law requiring using IFC models  
A good general knowledge and interest in BIM

Many customers demand and many designers and some contractors are using BIM

### Weaknesses



BIM level of use is weak, mainly focused on efficiently producing drawings  
BIM has not yet reached Building Management (operations and maintenance) domain  
Customers have little knowledge why, what and how to demand

## 4. Results

With regard to the BIM profiles the situation differs in each country. This is also true for the tasks and competencies of each BIM profile. However some profiles in different countries are similar. Also the tasks and competencies are comparable. This is especially true for the BIM manager, BIM Coordinator and BIM modeler (BIM expert). For the BIM Evaluator and BIM Facility manager there is much less consistent data available.

The similarities for the BIM Manager, BIM Coordinator and BIM Expert are described below:

- BIM Manager
  - leads and manages BIM (project)implementation;
  - has an EQF 7 level obtained by education or working experience;
  - has a background in one of the following working fields: construction management, building management, financing and procurement and architecture.

### Tasks:

- Establish organization goals related to BIM
- Establish BIM implementation in organization
- To develop and implement BIM standards in projects and own organization
- Set up BIM in project with other project parties.
- Responsible for training employees
- Analysis and implement best practices related to BIM in organization and projects
- Coordinates operations among participating disciplines and establishes quality controls
- Definition of the BIM Execution plan

### Competencies:

- Leadership skills
- Collaboration, communication, negotiation and coordination skills
- Research skills
- Analytical skills
- Technical skills
- Risk control

- BIM Coordinator
  - the BIM Coordinator coordinates primarily the integration of different models;
  - has an EQF 7 level obtained by education or working experience;
  - has a background in one of the following working fields: construction management, architecture, building management, structural engineering, mechanical engineering, electrical engineering.

### Tasks:

- Coordination of models
- Digital workflow management
- Ensure interoperability between individual parts of the BIM model



- Advising project team in preparing development plan for using BIM in projects.
- Integrating different aspect models
- Interface with different stakeholders in project
- Quality management on BIM model/ auditing
- Training project team members

Competencies:

- Training competencies
- Leadership skills
- Communication and collaboration skills
- Technical skills and knowledge
- Quality assessment skills
- Model coordination skills
- Problem solving
- Leadership skills
- Collaboration, communication, negotiation and coordination skills
- Research skills
- Analytical skills
- Technical skills
- Risk control

- BIM Expert (or BIM Modeler)

- creates models according to BIM standards;
- has an EQF level 5 or 6 obtained by education or working experience;
- has a background in one of the following working fields: architecture, structural engineering, mechanical engineering (including plumbing), electrical engineering, construction engineering.

Tasks:

- BIM Modelling
- Content development
- Preparing project documentation
- Ensure accuracy model
- Collaborate and coordinate with other project members/professions
- Following BIM standards

Competencies:

- Modeling competencies
- Technical skills and knowledge
- Communication and collaborating skills
- Analytical

The profile of the BIM Expert user differs more than previous profiles. The common features are listed below:

- BIM Expert user:
  - has a EQF level 6 obtained by education or working experience;

- has a background in one of the following working fields: architecture, structural engineering, mechanical engineering, electrical engineering, construction management, building management.

Tasks:

- Manage and coordinate project deliveries. Defines tasks together with project team.
- Strive to build strong network connections with project stakeholders.
- Discussing with internal and external parties such as contractors and subcontractors
- mediate between the different decision makers (for example, Client Project Manager, designers, production managers or worksites) and BIM Modeler (Data Configurators in the Information Model)
- insert the disciplinary knowledge into the operational modeling and into the information management
- To create, develop and to extract documentation from models.

Competencies:

- Technical skills and knowledge.
- Communication and collaboration skills.
- Capability and qualification of the capability to contribute to produce and check a Model of current fixed assets
- Solution-oriented
- Capability and qualification of the capability to analyze a proposal of Information Management
- Knowledge of BIM standards.