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## IO2. CLASSIFICATION OF BIM CURRICULUM IN EU AND BIM ACTOR COMPETENCE MATRIX

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## Acronym

BIM	Building Information Modeling
VET	Vocational education and training
HE	Higher Education
EQVET	European Credit System for Vocational Education and Training
VQTS	Vocational Qualification Transfer System

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# 1. Introduction

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Building Information Modelling (BIM) is in the process of rapidly changing the way in which construction projects are obtained, designed, constructed and managed throughout the lifecycle of a building.

While new skills are necessary, the project Standardized Vocational Education and Training for BIM in EU (BIM4VET) addresses the urgent need to devise a skills matrix, which is transparent and unified for BIM actors throughout Europe, to standardize BIM tasks and processes within the European Union, taking existing international developments into account, and to classify and standardize BIM training programme and certification schemes.

The BIM4VET objectives are to contribute towards the European Area of Skills and Qualifications by focusing upon the issue of BIM actor's qualifications transparency and BIM training in Europe. It will also be the first steps towards a convergence roadmap for European training curriculums.

Moreover, the partners will develop the BIM4VET platform dedicated to BIM maturity assessment as well as BIM training course recommendation according to the professionals' needs. A tangible interface will be implemented in order to reinforce the collaborative aspects of training courses selection. This will enable BIM skills to be assessed collectively and individually for the actors that work together on a digital model project using BIM processes.

## 2. BIM actor competence matrix

“Comparing training programs and understanding qualifications from other countries’ systems is one of the main challenges of ECVET implementation. This is because of the various approaches, concepts and traditions for designing and describing qualifications. The VQTS (Vocational Qualification Transfer System) approach [15] seeks to transcend the incomparability of qualifications and training contents by focusing on work processes. Of course, differences exist between national ways of offering and organizing training but one can identify many similarities in the tasks of work processes. As different countries tend to apply similar material, technologies and processes, the occupational requirements or the core work tasks – and the necessary vocational or professional competences – in an occupational field can be better compared than the training programs in different countries for these competencies.

The VQTS model provides a ‘common language’ to describe competences and their acquisition and also offers a way to relate these competence descriptions to the competences acquired in training programs. On the one hand, the VQTS model focuses on competences related to the work process and identifies the core work tasks within the context of the particular occupational field. On the other hand, the VQTS model follows a ‘development logical’ differentiation of a competence profile (known as a competence development or acquisition model) and thus can also describe the acquisition of competences.

The description of competences in relation to core work tasks can be seen as an attempt to bridge the terminological and ideological gap between the world of education and the world of work.”

The VTQS model has been chosen in the BIM4VET project as the data collected to develop the competence matrix comes from study of VET and HE training curriculums, and as it seeks to provide information about developing core elements and the ways of applying the VQTS model; in particular, how to use it in the context of transnational mobility and how to enhance permeability between VET and HE programs.

### 2.1. Normative references

The following normative references are essential for the understanding of the competence matrix development. For dated references, only the mentioned version applies. For undated references, the latest edition of the publication referred to applies (including any amendments).

- **PAS 1093:2009-07** Human Resource Development with special consideration of Learning, Education and Training – Competence Modelling in Human Resource Development

### 2.2. Principles of competence modelling

In PAS 1093:2009-07, principles of competence modelling are described. We have listed the ones that interest BIM4VET project:

- **Principle 1:** Competences are always a construct.  
Competences cannot be absolutely and objectively defined and thus will always be a construct. For this reason competences will always be comprised of a normative definition that is undertaken individually by individuals or organizations but should not be arbitrarily established.
- **Principle 2:** Competences cannot be equated with qualification, activities, or performance.  
Competences as a construct show themselves in the activities or performance of a person, group, or organization, but may not be equated with said actions or performance.  
Competences are a term of qualification that refers to a formal recognition of learning outcomes and are to be distinguished from business management or colloquial competence terms that equate competence with activities.



- o **Principle 3:** Competences cannot be observed directly but can only be inferred indirectly by the observation of activities in a defined situation.
- o **Principle 4:** Competences also cannot be measured directly but only indirectly by the measurement of activities in a defined situation.
- o **Principle 5:** Competences can be constructed independently from a situation but always appear dependent on the situation
- o **Principle 6:** Competences can be built and improved individually, in groups and in the whole organisation through development activities

## 2.3. Competence matrix development rules

The competence matrix development rules are addresses in:

CEN Workshop Agreement CWA 16624-3 “e-Competence Framework for ICT Users - Part 3: Development Guidelines” (see [ftp://ftp.cen.eu/CEN/Sectors/List/ICT/CWAs/CWA%2016624\\_3.pdf](ftp://ftp.cen.eu/CEN/Sectors/List/ICT/CWAs/CWA%2016624_3.pdf))

An area of competences (or a core work task) is composed of child competencies and each child competence may have its own proficiency level (step of competence development) sequence (e.g., be divided into different levels). A level can be used to ascertain or to identify progress, advancement or improvement in a competency.

The number of level per competence may be the same for each competence, or not. We can decide to have 3 levels per competence, or we may decide that each competence may have different number of levels. For example, concerning a competence matrix of a social worker, one area of competence can be “social skill”. This area can have 2 child competencies “communication skill” and “negotiation skills”. Communication skills may have 2 levels of proficiency. Negotiation skills may have 3 levels of proficiency

In a specific organization, like an hospital, you can have social workers working at different hierarchical levels. The position you have in a hierarchical level (N, N+1, N+2), determines the level of proficiency you have to have.

For example, if you occupy a N+1 position, communication skills level 2 and negotiation skill level 2 are required.

	Communication skills	Negotiation skills
N	Level 1, performance criteria a, b, c	Level 1
N+1	Level 2, performance criteria a, b, c, d	Level 2
N+2	Level 2	Level 3

To evaluate if N+1 has a communication skills level 2 and a negotiation skill level 2, each level of each competence of the competence matrix has to be composed of performance criteria. A performance criteria can be an activity N+1 has to be able to do, to perform.

The number of performance criteria per level is not fixed. One specific level may be composed of 3 performance criteria. Another one may be composed of 4 or 5 performance criteria.

The evaluation has to proof that N+1 fulfills all (or a determine number) performance criteria of the required level.

## 2.4. Competence matrix

### 2.4.1. Competence Areas

A competence area comprises various forms of competences (i.e. knowledge, skills and competences)

necessary for performing core work tasks / main activities in a certain occupational field. Based on core tasks a varying number of competence areas are defined, depending on the complexity, range of activities or job opportunities within a certain occupation.

Core work tasks are tasks within the work context of the BIM actor, within the predefined occupational field. Core work tasks of the target group (BIM actors) in the predefined occupational field derive empirically from the working experience of BIM actors and form the study of VET and HE curricula.

The list of competence areas and competences of BIM actors should be considered as a dynamic (not fixed) list, which allows responding to major changes in the occupational field of BIM actors by adding or removing areas. They are described in such a way that they have to promote mutual understanding between stakeholders: BIM actors, VET and HE organisations, and other interested parties.

### 2.4.2. Competence levels – steps of competence development

For each competence area, 3 steps of competence development (from “Advanced beginner”, “Proficient” to “Expert”) are described. The three steps of competence development only apply to one single competence area the last step of competence development (“Expert”) always includes all competences described in the previous steps (“Advanced beginner” and “Proficient”).

The 3 levels of competence development have been derived and adapted from Anderson’s works [1] which revised the Bloom Taxonomy [3] and Dreyfus model of skills acquisition [10].

- The ‘**Advanced Beginner**’ has a basic understanding about his/her profession and can complete simple tasks without supervision.
- The ‘**Proficient**’ has a proficient understanding of his/her profession, is able to break material/concepts into parts, but is also able to see their interrelations and the wider context (at least partly). He/she is able to work towards a standard independently, though it might lack refinement.
- The ‘**Expert**’ has a deep and holistic understanding of his/her job and a high level of experience. He/she is able to solve a problem by applying analytical approaches and is able to generate, plan or produce new patterns or structures.

## 2.5. BIM Competence matrix

### 2.5.1. Methodology towards a BIM competence matrix

The methodology deployed in the BIM4VET project for reaching the BIM competence matrix respected the following steps (see Figure 1):

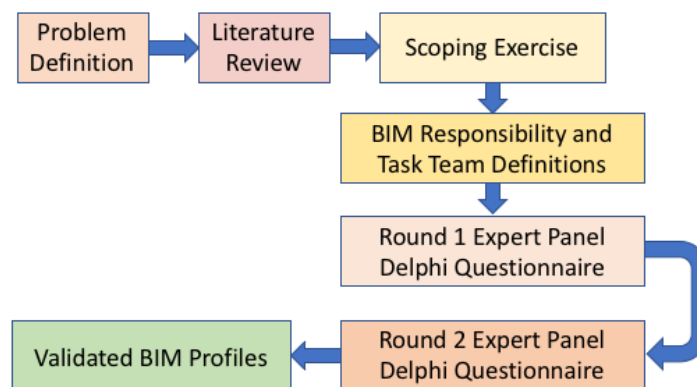


Figure 1 - Research Methodology Flow Chart

#### 2.5.1.1. Problem Definition

This element of the BIM4VET research is focused upon the delivery of a BIM competency maturity matrix that has analysed, synthesized and evaluated the multitude of BIM related skills and abilities necessary to fulfil tasks within a BIM environment and lends itself towards a certification of competencies [23]. The research is engaged upon the definition and identification of responsibilities related to the activities implied within a BIM business process portfolio.

The research also incorporates the definition of skill levels for an individual or BIM learner within the BIM environment and the BIM maturity assessment of those individuals. The maturity matrix will act as a knowledge repository to enable a comparison and gap analysis to provide training advice to BIM learners.

It also provides a maturity platform for construction sector professionals to assess their individual skills and training requirements in Building Information Modelling (BIM). The research has been conducted through an applied research approach using a qualitative approach to define BIM competencies, responsibilities and skill levels.

#### 2.5.1.2. Literature Review

A literature review was undertaken to recognise previous research and journal publications which would contribute towards developing a BIM based knowledge repository over a wide range of engineering discipline [5]. The gaps in current research were used to establish a scoping study that was distributed to a number of internal BIM experts as explained in the following chapters.

#### 2.5.1.3. Scoping Study

The initial research into developing an assessment framework on competencies was undertaken through a scoping study based upon a question approach to a number of internal BIM Subject Matter Experts (SME's). Two question papers were compiled, one relating to the identification of the criteria relating to the repository of BIM expertise. A copy of which is contained within in the IO1 deliverable (see Annex A).

This study gathers information from each participant relating to the Company / Organisation, any BIM expertise and experience especially in the areas of procurement. Finally, the questionnaire gathers details upon sources of BIM information and storage.

The second question paper was developed to understand the current use of BIM within the participants company and wider engagements. The questionnaire also included specific questions upon the perceived maturity level, current training provisions, costs, management and qualifications together with any constraints or barriers. A copy is contained within IO1 deliverable (See Annex B).

Feedback from the initial scoping exercises indicated that further research was required on the structure of BIM team compositions and profile developments prior to the development of a maturity assessment. The results of the scoping exercise were used to develop individual BIM responsibilities and task team definitions that would facilitate the assembly of a BIM competency framework.

#### 2.5.1.4. BIM Responsibilities and Task Team Definitions

A scoping exercise was undertaken to identify existing BIM competency schedules that can be utilized within this research project. BuildingSMART has implemented a Professional Certification Program [6] which enables learning organisations to educate and certify individuals for quality assurance purposes for consistency with international standards and best practices. The list of learning objectives generated from within a Learning Outcome Framework (LOF) form the basis from which training organisations can develop course content. It does not provide a benchmarking framework for individual competencies.

However, some BIM competencies have been included within the Omniclass Table 32 'Services' [16] and therefore, a review of BIM-related roles was undertaken to establish a framework of primary actors that have emerged from a BIM team selection process. Each BIM role was examined and a competency-based evaluation undertaken to define the main components and associated responsibilities.

A repository of BIM Competency Sets and Topics has been developed by the BIME Initiative [20] for evaluating and comparing the abilities of individuals, groups and whole organisations and identifying competency profiles of varied roles across markets and disciplines.

Each primary BIM-related role identified, and its associated competencies were mapped across to the BIME Initiative's repository of competency sets and competency topics to produce a role-based repository of BIM expertise. This research also builds upon the integrated approach to BIM competency assessment, acquisition and application [22] by adopting the competency sets as benchmarking for a profile validation exercise.

#### 2.5.1.5. Delphi Method

The Delphi method was first introduced into literature in 1944 to create reports about future military technological capabilities by the US Air Corps [8]. The Delphi Survey Method (DSM) is a forecasting and decision-making technique gathers data from respondents within their field of expertise through an anonymous panel of iterative communications [13], [24]. The DSM was chosen as the research method for developing a point of consensus from a group of selected BIM SME's.

The DSM gathers information and inputs without the participants meeting face to face. This identified systematic forecasting method gains opinions from the SME's over two or more rounds with the use of multiple interactions, which include a feedback process through a Delphi facilitator. This technique is well suited for establishing a consensus within a panel of expert respondents and it requires each panel member to evaluate their position based upon the previous results of the group. This is useful for when individual responses fall outside the group norm requiring an individual analysis for the differing viewpoint.

#### 2.5.1.6. BIM Profile Validation

After two DSM consensus rounds, four BIM profiles were compiled that each contained a repository of BIM related responsibilities, competencies and skill levels. The results of the round 2 questionnaires provided an aggregated opinion from a diverse set of SME's and were used to inform each of the BIM-related profiles. The aggregated BIM skills repository profiles would be used as benchmark for the maturity assessment being developed in the wider project deliverables.

### 2.5.2. BIM competence matrix structure

There is little consensus amongst researchers for the definition of a 'competency' [18]. An integrated definition of individual BIM competencies has been proposed by Succar et al. [21] which does align with a number of earlier competency definitions is as follows:

*'Individual BIM competencies are the personal traits, professional knowledge and technical abilities required by an individual to perform a BIM activity or deliver a BIM-related outcomes. These abilities, activities or outcomes must be measureable against performance standards and can be acquired or improved through education, training and/or development.'*

Analysing the above definition it can be seen that the primary focus is upon an individual competency rather than an aggregated set as found within a company. It also combines knowledge, skills and personal traits to define a BIM competency. All of which that can be acquired from formal education, vocational and professional development.

The following definitions are used within this research to define the relationships between an activity, competency and responsibility in a BIM context:

- An **activity** is a task that an agent has done, will do or is currently doing. Activities can consist of a single operation carried out on a task, or a collection of actions/tasks that are grouped or sequenced to fulfil a defined function or objective.
- A **competency** is the ability to do something successfully or to a set standard and generally defined as a combination of knowledge, skills and abilities and other characteristics required to perform a specific task.

- A **responsibility** is the conceptualisation of the relationship between an Agent or Role and an Activity. The responsibility defines the assignment/requirement of the Agent (or the Agent assigned the Role) to complete the specified activity
- A **role** is a collection of rights and responsibilities for a defined function.

Concretely, based on the rules required for competence matrix and considering the emergent status of the BIM profiles in the AEC sector at the moment of the research, it has been decided to develop the competence matrix according to the following framework (see Table 1):

**Table 1. Structure for competence matrix**

Role	Responsibility	Competency
ID Name	ID Description	ID Description

In order to determine the BIM profiles as well as the associated BIM responsibilities, several documentary sources have been listed by training and construction sector specialists, the sources are from different kinds (see section bibliography):

- Web sites linked with the construction sector and with BIM activity,
- Job offers,
- Norms, labels and framework,
- Scientific and Professional articles and studies,
- Bibliographical references.

Finally, based on the 201in Competency Table developed by the BIME Initiative [20], the BIM competencies have associated to each BIM responsibilities.

Interviews of professionals have then stabilized a first version of the BIM competence matrix that were used for the first step of the Delphi Survey Method.

### 2.5.2.1. BIM profile and responsibilities

The assessment of maturity for a BIM learner is based upon defined responsibility and competencies. As a benchmark for assessment four BIM profiles have been developed that are used as benchmark stages of maturity. Each profile has a responsibility and competencies associated with it that allow for a comprehensive review of roles and skill levels to enable a maturity assessment to be undertaken using an overall European Qualifications Framework (EQF) level.

This assessment differs from that of the Arup Maturity Matrix [7] which is an excel based tool primarily aimed at demonstrating current capability and measuring the maturity of different aspects of BIM adoption within a project. The Arup Maturity Matrix is aimed primarily at identifying a project position against a UK BIM Level 2 target level requirement.

The four BIM profiles used in the competency framework assessment have been developed from PAS1192-2 and the responsibilities associated with information management within roles of a task team. Guidance has also been derived from the CIC BIM Protocol [9] which states 'an Employer is required to appoint an information manager as a wider set of duties under a Design Lead or Project Lead appointment'. For the purposes of the assessment this role is entitled '*BIM Manager*' and is at the Project Level.

From PAS1192-2, Information Delivery, the specification requires roles to be embedded into contracts, either through a specific schedule of services or more general obligations. Therefore, PAS1192-2 identifies the types of roles that should be considered. The specification also notes that on projects led with the CIC BIM Protocol a key role is the Information Manager or '*BIM Manager*'.

Kymmell [14] surmises the three primary BIM-related roles that emerge from a team selection process are the *BIM Manager*, the *BIM Operator*, and the *BIM Facilitator*. Further research using UK BIM advertised roles as a primary source of information [12] identified the spread of responsibilities relating to job descriptions and also identified that three core roles are likely to be found in BIM project teams which align themselves with Kymmell's three BIM Specialist Roles.

The Building Information Council (BIR) is based in the Netherlands and from a partnership between various stakeholders in the Dutch construction and infrastructure industry. BIR have identified the benefits to business through the uptake of BIM and have published a knowledge leaflet entitled 'BIR Leaflet Number 3 - BIM Roles and Competences' [4]. Here, the most common BIM roles in the Dutch construction sector have been identified and expanded to include roles and competencies for individuals and organisations. BIR No 3 includes four main roles of a BIM Project Manager, BIM Coordinator, BIM Team Manager and BIM Modeler with a number of key competencies aligned to each role.

In a review of BIM job vacancy advertisements undertaken by Barison and Santos [2] the competencies and roles identified for a BIM Modeller required attributes to develop and extract 2D documentation from BIM models. Similar attributes to the BIM Modeller were also identified by Kymmell [2] who described the role as a BIM Operator. Similar descriptions also can be found in BIM Demystified [17]. For this research project the term BIM Author has been adopted as it aligns itself with PAS1192-2 Task Team Role. Comparisons of BIM role definitions are contained within [Figure 2](#) and show how the BIM4VET team role descriptions align themselves with current research and industry descriptions.

**Table 2. BIM roles in the literature**

BIM Role Definitions			
BIM4VET	Kymmell	BIR Leaflet No 3 (Equivalents)	Gathercole (Job titles included)
BIM Manager	BIM Manager	BIM Team Manager (Program Manager, Business Development Manager)	BIM Manager (BIM Manager, BIM Leader, BIM Consultant, BIM Discipline Head)
BIM Coordinator	BIM Facilitator	BIM Coordinator (Manufacturing Engineer, Project Coordinator)	BIM Coordinator (BIM Coordinator, BIM Implementer, BIM Integrator, BIM Practitioner, BIM Specialist)
Senior BIM Author	-	BIM Project Manager (Process Manager, Information Manager, Project Leader)	BIM Engineer (BIM Engineer, BIM Architect, BIM Designer, BIM Structural Draftsman)
BIM Author	BIM Operator	BIM Modeler (Specialist, Engineer, 3D Designer)	BIM Technician (BIM Technician, BIM Modeller, BIM Operator)

**Figure 2 - Comparison of BIM Role Definitions**

The BIM profiles that were identified were the following (see Figure 3):

1. **BIM Manager** who is responsible for leading the project coordination and standards compliance at the project level.
2. **BIM Coordinator** who is a senior staff and is responsible for the coordination and standards compliance at the team level.
3. **Senior BIM Author** who is a senior staff member who produces design outputs such as models, drawings, schedules and reports for his team.
4. **BIM Author** is a staff member who produces design outputs such as models, schedules and reports for his team.



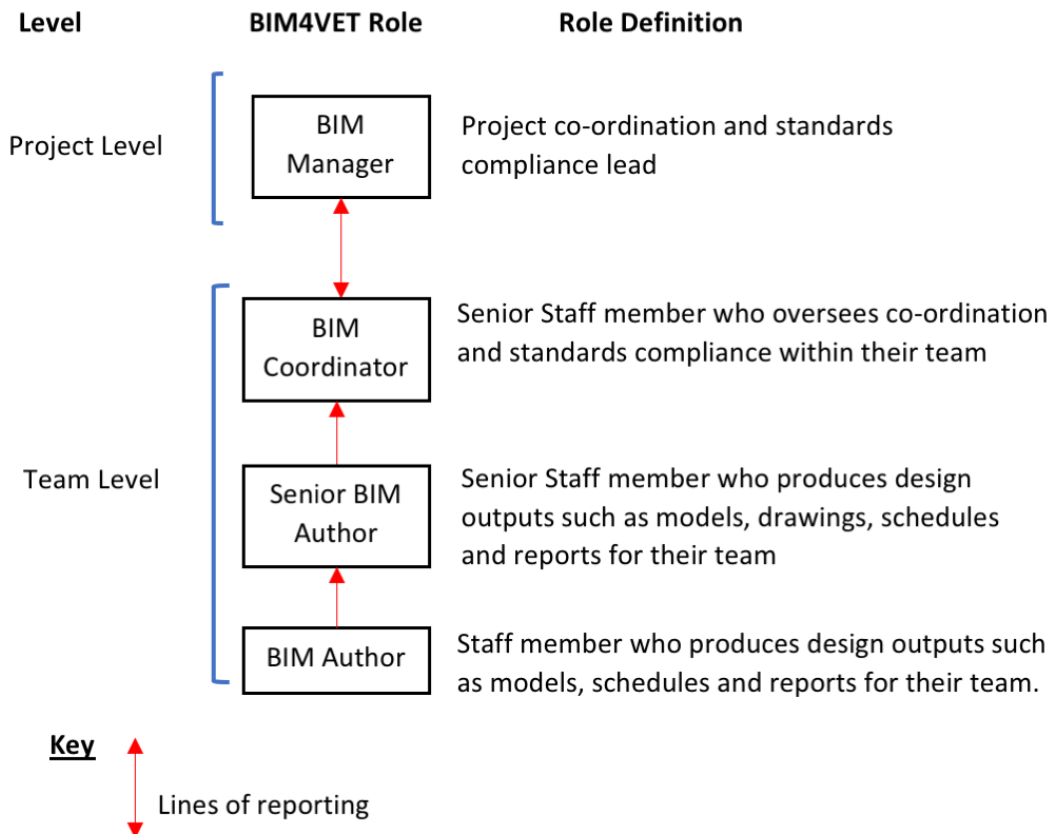


Figure 3. BIM4VET roles and relationship

### 2.5.2.2. BIM competency

The research led in the BIM4VET project uses Succar's integrated definition of a competence [21] as a foundation for developing a maturity matrix where competency is defined as a statement of a particular skill level where skill level is a position on a scale measuring knowledge, expertise or ability to conduct a defined competency. Therefore, a competency contains a defined skill.

The 201in Competency Table developed by the BIME Initiative [20] has 8 Competency sets with an accompany 55 Competency Topics, each defined within a BIM Dictionary. The BIM Dictionary [19], an online resource hosts terms specific to digital transformation in the construction industry and hundreds of terms with their descriptions, synonyms and abbreviations.

The 201in Competency Table B is organised within four primary sets of Managerial, Functional, Technical and Supportive headings. There are also four secondary competency sets of Administration, Operation, Implementation and Research & Development. The table below extracted from (Succar, 2013) presents the competency sets.

The license related to this framework is the following ([20]:

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**Table 3. 201in Competency sets**

Competency set	Competency topic (Partial)	Individual BIM Competency Item (Sample items at low-detail definition; expressed as activities)
<b>Managerial</b>	Leadership	Generate an overall mission statement covering BIM Implementation within an organisation
	Strategic planning	Define the strategic objectives to be achieved from implementing BIM software tools and model-based workflows
	Organisational management	Identify changes to organisational processes as necessary to benefit from model-based workflows
<b>Administration</b>	Administration, policies and procedures	Organize initiatives to encourage staff to adopt BIM software tools and workflows within the organization
	Finance, accounting and budgeting	Establish the necessary metrics to measure the financial performance of BIM projects
	Human resource management	Identify the responsibilities of a BIM manager, a model manager and similar BIM roles
<b>Functional</b>	Collaboration	Develop model ownership protocols with other project participants at/before the start of collaborative BIM projects
	Facilitation	Act as the project team's BIM facilitator during the delivery of collaborative BIM projects
	Team and workflow management	Use a content management system or a document management system to manage information storage and sharing
<b>Operation</b>	Designing and conceptualizing	Use a BIM software tool to generate a rough representation of a space through basic geometry and identify spatial relationships
	Analysing and simulating	Use specialized software tools to generate a thermal study from a data rich 3D model
	Quantifying and estimating	Prepare a BIModel for the purpose of linking it to a construction schedule
<b>Technical</b>	Modelling and drafting	Generate BIModels using a pre-defined set of standards and guidelines
	Documentation and detailing	Generate 2D Drawings of an accuracy suitable for construction documentation and submittal for Tender/Bid
	Model management	Maintain a BIModel according to modelling standards set by the organisation or project team
<b>Implementation</b>	Implementation fundamentals	Compare different BIM software tools and select the one most suitable for an organization
	Component development	Generate basic model components which comply with organisation's modelling standards
	Technical training	Develop a skill register, a training log or similar to track existing and newly acquired skills
<b>Supportive</b>	IT support	Conduct tests to establish whether IT systems are running at required levels of performance and stability
	Software and web development	Develop tools/extensions to improve the project deliverables of off-the-shelf BIM software tools
	Software-related troubleshooting	Manage the relationship between an organisation and its BIM software tool vendor/reseller
<b>Research and development</b>	General R&D	Generate a BIM-specific R&D plan for an organization
	Teaching and coaching	Develop a well-defined approach to identify change resistance or change saturation during the BIM implementation process
	Industry engagement and knowledge sharing	Develop non-technical educational material to assist staff in understanding the business and process requirements of BIM

The following tables details the competency sets. These tables are extracted from [20].

## Managerial Set

**“Summary:** the decision-making abilities which drive the selection/adoption of long-term strategies and initiatives. Managerial competencies include leadership, strategic planning, and organizational management.”



**Table 4. Managerial set**

Code	Competency topic	Description
M01	<i>General Management</i>	Defining and communicating overall managerial goals from adopting new systems and workflows
M02	<i>Leadership</i>	Leading and guiding others throughout the process of implementing new systems and workflows
M03	<i>Strategic Planning</i>	Identifying strategic objectives and developing implementation strategies
M04	<i>Organizational Management</i>	Identifying the organizational changes necessary for instigating, monitoring and improving BIM Adoption
M05	<i>Business Development &amp; Client Management</i>	Maximizing the value achieved by the organization and its clients from BIM tools and workflows
M06	<i>Partnership &amp; Alliances</i>	Initiating partnerships and alliances with other organizations based on BIM Deliverables and workflows

## Administration Set

**“Summary:** the day-to-day organizational activities required to meet and maintain strategic objectives. Administration competencies include tendering and procurement, contract management, and human resource management.”

**Table 5. Administration set**

Code	Competency topic	Description
A01	<i>Administration, Policies &amp; Procedures</i>	Developing managerial initiatives into policies and procedures to facilitate the adoption of BIM tools and workflows
A02	<i>Finance, Accounting &amp; Budgeting</i>	Planning, allocating and monitoring the costs associated with BIM Adoption
A03	<i>Performance Management</i>	Assessing organizational BIM capability/maturity, Individual Competency and project performance using standardized metrics
A04	<i>Human Resource Management</i>	Planning, developing and managing human resources as to align staff competencies to organizational BIM goals
A05	<i>Marketing</i>	Promoting an organization's BIM Capability to its clients and business partners
A06	<i>Tendering &amp; Procurement</i>	Developing the necessary specifications and documents to pre-qualify, recommend or procure BIM products and services
A07	<i>Contract Management</i>	Administering the contractual documentation underlying Collaborative BIM Projects and workflows
A08	<i>Risk Management</i>	Managing the risks associated with using BIM tools and collaborative workflows
A09	<i>Quality Management</i>	Establishing, managing and controlling the quality of models, documentation and other Project Deliverables

## Functional Set

**“Summary:** the non-technical, overall abilities required to initiate, manage and deliver projects. Functional competencies include collaboration, facilitation and project management.”

**Table 6. Functional set**

Code	Competency topic	Description
F01	<i>Functional Basics</i>	Identifying the basic requirements and main deliverables expected from using BIM tools and workflows
F02	<i>Collaboration</i>	Preparing the documentation necessary to enable Model-based Collaboration between Project Participants
F03	<i>Facilitation</i>	Facilitating the process of BIM collaboration between Project Participants
F04	<i>Project Management</i>	Managing projects where BIM Workflows are used, and BIM deliverables are specified

## Operation Set

**“Summary:** the daily, hands-on individual efforts required to deliver a project or part/aspect of a project. Operational competencies include designing, simulating and quantifying.”

**Table 7. Operation set**

Code	Competency topic	Description
O01	<i>General Modelling</i>	Using software tools to model project requirements and generate Model-based Deliverables across industries, information systems and knowledge domains
O02	<i>Capturing &amp; Representing</i>	Using software tools and specialized equipment to capture and represent physical spaces and environments
O03	<i>Planning &amp; Designing</i>	Using software tools for conceptualization, planning and design
O04	<i>Simulating &amp; quantifying</i>	Using software tools to conduct various types of model-based simulations and estimations
O05	<i>Constructing &amp; Fabricating</i>	Using BI Models for the specific purposes of construction and fabrication
O06	<i>Operating &amp; Maintaining</i>	Using models to operate, manage and maintain a Facility
O07	<i>Monitoring &amp; Controlling</i>	Using models to monitor Building Performance or control its spaces, systems and equipment
O08	<i>Linking &amp; Extending</i>	Linking BI Models and their components to other databases
O09	<i>Custom Modelling</i>	Using software tools to deliver a custom combination of Model-based Deliverables reflecting a variety of Model Uses

## Technical Set

**“Summary:** the abilities required to generate Project Deliverables across disciplines and specialties. Technical competencies include modelling, drafting and model management.”

**Table 8. Technical set**

Identification	Definition
T01 <i>General IT</i>	Installing, managing and maintaining general IT infrastructure
T02 <i>Software Systems</i>	Selecting, deploying and maintaining software systems in a multi-user environment
T03 <i>Hardware &amp; equipment</i>	Specifying, recommending or procuring computer hardware and equipment
T04 <i>Modelling</i>	Generating BI Models based on pre-defined Modelling Standards and protocols
T05 <i>Documentation</i>	Generating drawings and construction documents using standardized details and workflows
T06 <i>Presentation &amp; Animation</i>	Generating professional-quality renderings or 3D animations using Specialized Software Tools
T07 <i>Model Management</i>	Managing and maintaining BI Models generated using standardized processes, protocols and specifications
T08 <i>Document Management</i>	Using Document Management Systems or like store, manage and share files and BI Models

## Implementation Set

**“Summary:** the activities required to introduce BIM concepts, tools and workflows into an organization. Implementation competencies include component development, standardization and technical training.”

**Table 9. Implementation set**

Code	Competency topic	Description
I01	<i>Implementation Fundamentals</i>	Identifying and managing issues associated with BIM implementation
I02	<i>Component Development</i>	Implementing a structured approach for developing or customizing Model Components using documented Modelling Standards
I03	<i>Library Management</i>	Developing or managing component libraries as required for the standardized delivery of BIM Projects
I04	<i>Standardization &amp; Templates</i>	Generating standardized templates, item lists and workflows for initiating, checking or delivering BIM Projects
I05	<i>Technical Training</i>	Developing a BIM Training Plan or maintaining a Skill Register to track staff training and their acquired skills
I06	<i>System &amp; Process Testing</i>	Assessing the capability/compatibility of systems and the suitability of workflows and procedures
I07	<i>Guides &amp; Manuals</i>	Developing guides, manuals or educational material covering Model based Workflows

## Supportive Set

**“Summary:** the abilities needed to maintain information technology and communication systems. Supportive competencies include data and network support, equipment support and software troubleshooting.”

Code	Competency topic	Description
S01	<i>General IT Support</i>	Troubleshooting software issues and supporting staff in resolving technical problems
S02	<i>Data &amp; Network Support</i>	Managing and maintaining the storage of data, documents, 2D Drawings and BIM Models
S03	<i>Equipment Support</i>	Developing specifications for BIM Hardware and BIM Hardware Deployment Programmes
S04	<i>Software Support</i>	Addressing issues related to BIM Software Tools, fulfilling relevant Support Tasks and managing the relationship with software vendors/resellers
S05	<i>Software &amp; Web Development</i>	Developing extensions for BIM Software Tools, productivity software or web portals to improve BIM Deliverables

## Research & Development Set

**“Summary:** the abilities required to evaluate existing processes, investigate new solutions and facilitate their adoption - within the organization or by the larger industry. R&D competencies include change management, knowledge engineering and industry engagement.”

**Table 10. Research & development**

Code	Competency topic	Description
R01	<i>General Research &amp; Development</i>	Conducting general or BIM-specific research and development activities
R02	<i>Strategy Development &amp; Planning</i>	Developing a BIM Implementation Strategy or a BIM Implementation Plan to guide BIM Adoption
R03	<i>Teaching &amp; Coaching</i>	Developing BIM training material to educate staff and facilitate the BIM Adoption process
R04	<i>Knowledge Management &amp; Engineering</i>	Developing a Knowledge Management Strategy and capturing/representing the BIM-specific knowledge of staff
R05	<i>Change Management</i>	Developing a Change Management strategy that accompanies/supports the BIM Implementation process
R06	<i>Research &amp; Analysis</i>	Participating in and/or publishing academic research focused on BIM innovation or collaboration
R07	<i>Industry Engagement &amp; Knowledge Sharing</i>	Sharing BIM knowledge and experience with the wider industry through formal/informal workshops, seminars and presentations

### 2.5.2.3. First BIM competence matrix

Following the methodology described above, the first version of the BIM responsibility and the related competencies for each BIM profile have been described. These elements (see tables below) have been used for the first round of the Delphi Survey Method involving the expert panel.

**Table 11. First draft of the BIM competence matrix**

Profile A – BIM Author	
Responsibility	Competency
A.1 Refer to the 5 done by other project team members	O08: Linking & Extending
A.2 Develop & maintain Graphical and Non-graphical models against Project Standards	T04: Modelling T07: Model Management
A.3 Prepare model for sharing with internal and external stakeholders	T04: Modelling T07: Model Management
A.4 Produce project outputs from graphical and non-graphical models.	O01: General Modelling O09: Custom Modelling T05: Documentation
A.5 Revise outputs to incorporate clash resolution: - Maintain a continuous interface with the BIM Coordinator - Participate in coordination and BIM technology meetings	O01: General Modelling O02: Capturing and Representing
A.6 Reference of other shared models to ensure design co-ordination and clash avoidance.	O08: Linking & Extending
A.7 Revise Outputs regarding QA/QC protocols.	T04: Modelling A09: Quality Management

Profile B – Senior BIM Author	
Responsibility	Competency
B.1 Reference of other shared models to ensure design co-ordination and clash avoidance.	O08: Linking & Extending
B.2 Develop & maintain Graphical and Non-graphical models against Project Standards.	T04: Modelling T05: Documentation
B.3 Produce project outputs from graphical and non-graphical models.	O01: General Modelling O09: Custom Modelling T05: Documentation
B.4 Assist in Maintaining Project Standards	

		A09: Quality Management I01: Implementation Fundamentals I04: Standardization and Templates
B.5	Address immediate software issues and support the upskilling of staff	
		I05: Technical Training R03: Teaching and Coaching
B.6	Remain fully UP TO DATE with Industry good practice around the production and exchange of Information	
		R01: General Research and Development R07: Industry Engagement and Knowledge Sharing
B.7	Help maintain internal CAD standards and workflow by providing feedback to BIM coordinator	
		A09: Quality Management I01: Implementation Fundamentals I04: Standardization and Templates

Profile C - BIM Coordinator		
	Responsibility	Competency
C.1	Ensure compliance to project standards	
		A09: Quality Management I01: Implementation Fundamentals
C.2	Ensure compliance to corporate standards	
		A09: Quality Management I01: Implementation Fundamentals I04: Standardization and Templates
C.3	Ensure compliance to relevant national and international standards	
		A09: Quality Management I01: Implementation Fundamentals I04: Standardization and Templates
C.4	Coordinate the different BIM Modeller/Technicians outputs to ensure the good quality and compliance of the model according to the BIM Project Execution Plan / BIM Protocol/client's requirements	
		A09: Quality Management F02: Collaboration F03: Facilitation I01: Implementation Fundamentals
C.5	Supervise Clash detection, reporting and resolution	
		A09: Quality Management F04: Project Management I01: Implementation Fundamentals O04: Simulating and Fabricating O08: Linking and Exporting
C.6	Address immediate software issues and support the upskilling of staff	
		I05: Technical Training R03: Teaching and Coaching S04: Software Support

C.7	Ensure implementation of BIM software	T01: General IT T02: Software Systems A09: Quality Management
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Profile D – BIM Manager		
	Responsibility	Competency
D.1	Define & maintain project standards	F02: Collaboration F03: Facilitation F05: Team and Workflow Management T08: Document Management
D.2	Agree software solutions to be implemented	I06: System and Process Testing T02: Software Systems
D.3	Define project outputs, according to the client's requirement	F01: Functional Basics
D.4	Create & maintain a coordination programme for delivery	F04: Project Management I04: Standardization and Templates
D.5	Ensure the implementation of a system to share project information	F05: Team and Workflow Management T02: Software Systems T08: Document Management
D.6	Lead BIM activities at project level	F04: Project Management M02: Leadership
D.7	Assess project team capabilities to comply with project standards	A06: Tendering and Procurement

#### 2.5.2.4. Final BIM competence matrix

Then, the Delphi Survey Method was deployed. Two sets were necessary for the expert panel to reach a consensus. This part of the research work is described in detail in the IO1 deliverable. The table below presents the final BIM Competence matrix, and the level EQF resulting from the experts' consultation (See IO1 for more details).

**Table 12. Final version of the BIM competence matrix**

<b>Profile A – BIM Author – EQF Level 5</b>		
Ref:	Description: Staff member who produces design outputs such as models, drawings, schedules and reports for their team	
	<b>Responsibility</b>	<b>Competency</b>
A.1	Refer to the work done by other project team members	
		O08: Linking & Extending
A.2	Develop & maintain Graphical and Non-graphical models against Project Standards	
		T04: Modelling T07: Model Management T06: Presentation and Animation O01: General Modelling O02: Capturing and Representing
A.3	Prepare model for sharing with internal and external stakeholders	
		T04: Modelling O01: General Modelling
A.4	Produce project outputs from graphical and non-graphical models.	
		O01: General Modelling O09: Custom Modelling T05: Documentation.
A.5	Revise outputs to incorporate clash resolution: - Maintain a continuous interface with the BIM Coordinator - Participate in coordination and BIM technology meetings	
		O01: General Modelling O02: Capturing and Representing
A.6	Reference of other shared models to ensure design coordination and clash avoidance	
		O08: Linking & Extending

<b>Profile B – Senior BIM Author – EQF Level 6</b>		
Ref:	Description: Senior Staff member who produces design outputs such as models, drawings, schedules and reports for their team	
	<b>Responsibility</b>	<b>Competency</b>
B.1	Reference of other shared models to ensure design coordination and clash avoidance	
		O08: Linking & Extending
B.2	Develop & maintain Graphical and Non-graphical models against Project Standards	
		T04: Modelling T05: Documentation F02: Collaboration F05: Team and Workflow Management T07: Model Management
B.3	Produce project outputs from graphical and non-graphical models	
		O01: General Modelling

	O09: Custom Modelling T05: Documentation T06: Presentation and Animation
B.4 Assist in Maintaining Project Standards	
	A09: Quality Management I01: Implementation Fundamentals I04: Standardization and Templates F01: Functional Basics F02: Collaboration R03: Teaching and Coaching I06: System and Process Training M02: Leadership
B.5 Address immediate software issues and support the upskilling of staff	
	I05: Technical Training R03: Teaching and Coaching I07: Guides and Manuals
B.6 Remain fully UP TO DATE with Industry good practice around the production and exchange of Information	
	R01: General Research and Development R07: Industry Engagement and Knowledge Sharing
B.7 Help maintain internal CAD standards and workflow by providing feedback to BIM coordinator	
	A09: Quality Management I01: Implementation Fundamentals I04: Standardization and Templates
B.8 Prepare model for sharing with internal and external stakeholders	
	T07: Model Management
B.9 Revise Outputs regarding QA/QC protocols	
	T04: Modelling A09: Quality Management
B.10 Supervision of BIM Authors	
	M02: Leadership F04: Project Management F05: Team and Workflow Management



Profile C – BIM Coordinator – EQF Level 6		
Ref:	Description: Senior Staff member who oversees co-ordination and standards compliance within their team.	
	Responsibility	Competency
C.1	Ensure compliance to project standards	A09: Quality Management I01: Implementation Fundamentals
C.2	Ensure compliance to corporate standards	A09: Quality Management I01: Implementation Fundamentals I04: Standardization and Templates
C.3	Ensure compliance to relevant national and international standards	A09: Quality Management I01: Implementation Fundamentals I04: Standardization and Templates
C.4	Coordinate the different BIM Modeller/Technicians outputs to ensure the good quality and compliance of the model according to the BIM Project Execution Plan / BIM Protocol/client's requirements	A09: Quality Management F02: Collaboration F03: Facilitation I01: Implementation Fundamentals F04: Project management M02: Leadership
C.5	Supervise Clash detection, reporting and resolution	A09: Quality Management F04: Project Management I01: Implementation Fundamentals O04: Simulating and Fabricating O08: Linking and Exporting F05: Team and Workflow Management
C.6	Address immediate software issues and support the upskilling of staff	R03: Teaching and Coaching I07: Guides and Manuals
C.7	Ensure implementation of BIM software	T02: Software Systems A09: Quality Management R02: Strategy Development & Planning
C.8	Assist in Maintaining Project Standards	A09: Quality Management I01: Implementation Fundamentals I04: Standardization and Templates

Profile D – BIM Manager – EQF Level 7	
Ref:	Description: Project co-ordination and standards compliance lead
Responsibility	Competency
D.1 Define & maintain project standards	F02: Collaboration F03: Facilitation F05: Team and Workflow Management T08: Document Management A08: Risk Management I07: Guides and Manuals R02: Strategy Development & Planning A09: Quality Management M05: Business Development & Client Management
D.2 Agree software solutions to be implemented	I06: System and Process Testing T02: Software Systems
D.3 Define project outputs, according to the clients requirement	F01: Functional Basics
D.4 Create & maintain a coordination programme for delivery	F04: Project Management I04: Standardization and Templates
D.5 Ensure the implementation of a system to share project information	F05: Team and Workflow Management T02: Software Systems T08: Document Management M02: Leadership
D.6 Lead BIM activities at project level	F04: Project Management M02: Leadership M01: General Management M03: Strategic Planning
D.7 Assess project team capabilities to comply with project standards	A06: Tendering and Procurement A03: Performance Management A06: Tendering and Procurement A07: Contract Management
D.8 Remain fully UP TO DATE with Industry good practice around the production and exchange of Information	R01: General Research & Development R06: Research and Analysis R07: Industry Engagement and Knowledge Sharing

### 3. BIM Curriculum offer / BIM training benchmark

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#### 3.1. Method used to collect information

Various methods of collecting data were deployed in our work to identify BIM training offers and the associated structure or institution offering these courses. We first targeted the main institutions active in the BIM and construction field.

The main method used to gather BIM training offers was based on the use of the web-based survey and researches; two main researches types were deployed:

- Social networking sites (LinkedIn announcement in BIM related groups, contact with BIM expert across the Europe...),
- Websites of architectural and construction schools,
- Websites of training institutions.

Some of the courses were new and not yet figured in the website of the institutions (at the moment of the reviewing, in 2016), when this case appeared, we had to take contact with the related organisation to add these courses to the benchmark.

#### **Targeted training institutions**

In total, 10 institutions were identified in France, 9 institutions in UK, 3 institutions in Switzerland, 2 intuitions in Italy and Ireland, and 1 institution in each of Luxembourg, Belgium, Norway, Denmark and Spain. These institutions, offering BIM training course(s) identified in our database, are mainly:

1. Private training structures,
2. Research centres,
3. Universities.

#### **Data collected**

For each organization, the information collected can be grouped in two categories:

##### **Institution contact data:**

- Name of the organization
- Country
- Language
- Contact information

##### **Training offer presentation:**

- Name of the training
- BIM Level
- Training Description
- Duration
- Price
- Online / On site
- Certification / No Certification / EQF level
- Requirement
- What will you learn?
- Opens to
- Target
- Partnership

The data collected will be essential to identify the required training for each profile. Some training offers do not present all the data that we intend to collect in our benchmark, therefore, some training offers are not clear about their training programs and the outcomes in terms of what the participants should be able to do/understand by the end of the training event.

See annexed tables for more details about the training offers and the data collected for each one.

## 3.2. Analysis of data

In general, BIM training offers are few, but with the growth of BIM application in the construction industry, BIM training offers should increase. In 2016, we gathered in our database 75 training offers from 10 different European's countries:

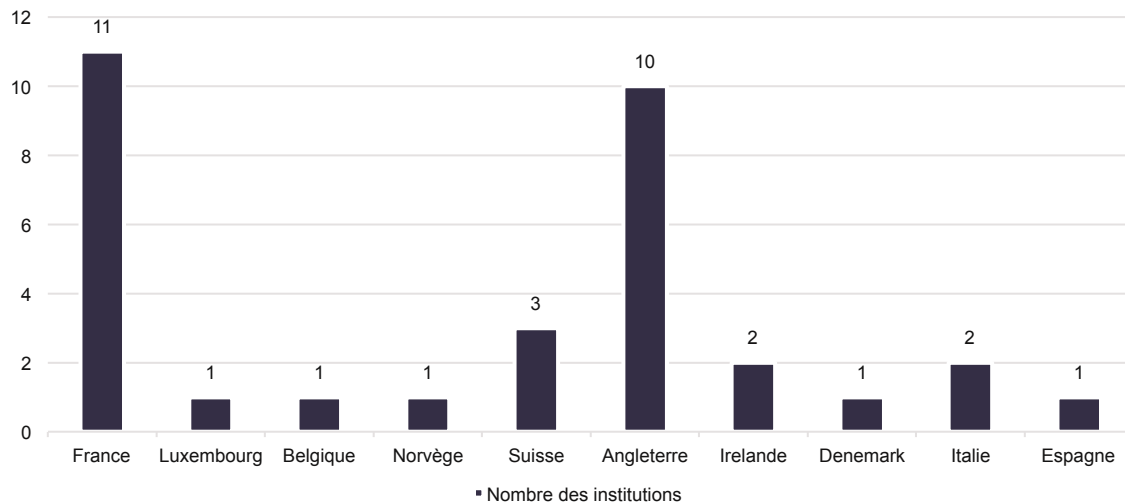
- France
- Luxembourg
- Belgium
- Switzerland
- Spain
- Italy
- Ireland
- Norway
- England
- Denmark

This is important to note that this review is not exhaustive, notably due to limitation about the language, which conducted researchers to principally limit their collection of data to the BIM training offer presented in French or English. In the database, France has the biggest number of training programs with 44 training offers.



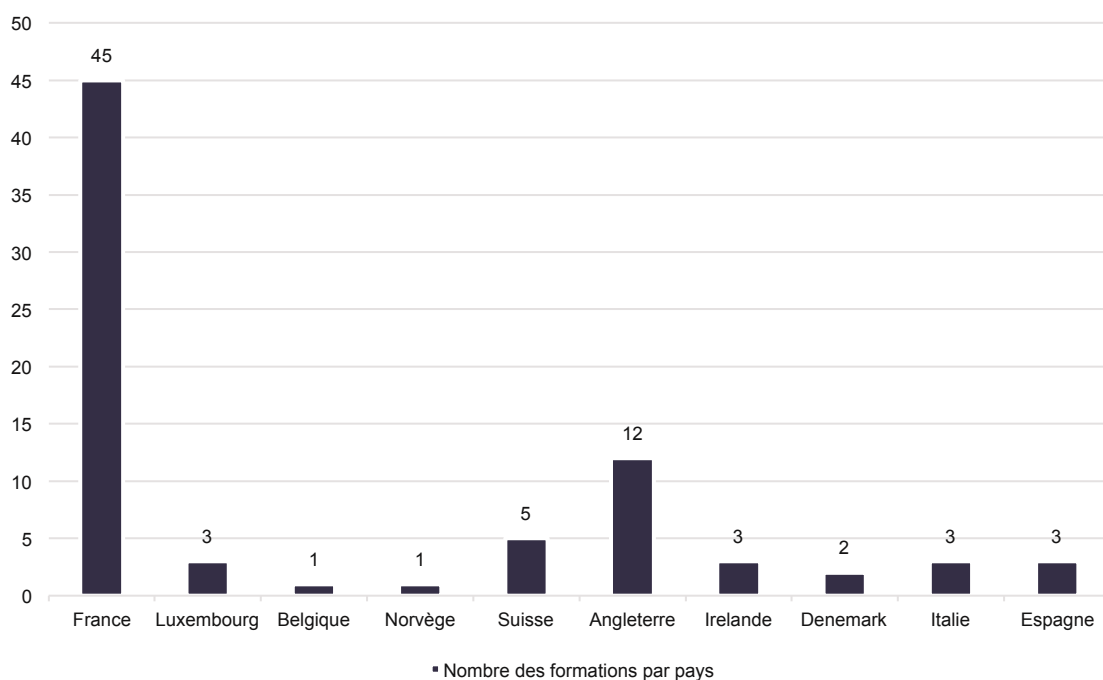
Figure 4. Localisation of the BIM offer in EU

The following graph presents the repartition of the host institutions by country within our data collection. France and UK have the higher number of institutions.



**Figure 5. Number of host institutions by country**

The following graph presents the repartition of the BIM training courses by country within our data collection.



**Figure 6. Number of training courses by country**

The following table presents the different host institutions identified in the data collection stage by country.

**Table 13. Host institution by country**

Country	Host institution
France	Oger Institut Ecole d'ingénieurs CESI CESI entreprises ESTP et ENPC ESTP CSTB Formations Le moniteur CNAM BIMway Paris Est Marne de la Vallée ENSA Toulouse
Luxembourg	House of training & LIST
Switzerland	Bec partners SA SIA Mensch und Maschine
Belgium	UCL et ECAM
Italy	Politecnico di Milano - Scuola Master Fratelli Pesenti Sapienza Università di Roma
Denmark	Technical University of Denmark
Norway	Norwegian University of Science and Technology
Spain	Universitat Internacional de Catalunya, Barcelona
United Kingdom	Middlesex University Birmingham City University University of Salford Manchester University of the West of England Northumbria University University of Liverpool The University of Wolverhampton University of Westminster University of Reading BRE Academy
Ireland	University College Cork   College of Science, Engineering and Food Science Dublin Institute of Technology

In our training benchmark, two main training types were identified, the short-term training, and the long-term training related to a master degree.

- **Short-term training:**

We had identified 46 training offers as a short-term training. This type of training is mainly informative about the BIM, giving the basics of BIM. These formations can be categorized in 3 categories:

1. **Initiation to BIM:** Most of training offering "an initiation" of BIM, are giving the basics of BIM in order to understand the origins and trends in BIM in term of usages, requirements, processes and technology (existing tools in the BIM world), and to acquire a vision on the benefit and the return on investment of BIM and the possible issues when implementing BIM.
2. **BIM intermediate training offers:** Mostly consist in offering more knowledge about BIM usages and their definitions, the advantage of BIM in the project life cycle, the collaboration and exchange between the different actors and their needs, the relation between different actors, and the software interoperability.
3. **Advanced BIM:** This category is offering a more advanced training helping in understanding BIM and its uses in different phases of the project, explaining BIM strategies and implementation, in addition to some case studies for real projects and applications. The juridical aspects in BIM are also covered.  
However, by conducting the short-term training, one can hardly claim being expert in BIM.

- **Long-term training:**

Another type of training also identified is the long-term training with a university diploma issuance. A BIM manager, BIM consultant positions are expected as an outcome of these trainings. These University Masters are mostly over 1 or 2 years offering wide BIM competencies. We had identified 18 training offers with an issuance of a university diploma. The targeted people for this kind of training are both students and professionals.

The training offers can be as well differentiated by their objects:

- **Informative training:** Mainly the short-term training, where attendees will have informative training about the BIM
- **Practice training:** Mainly the university masters offers and the modelling training offers where attendees will acquire modelling skills with BIM-software..

Finally the target is the last important element distinguishing the BIM training courses. The training offers presented in the benchmark are generally open to:

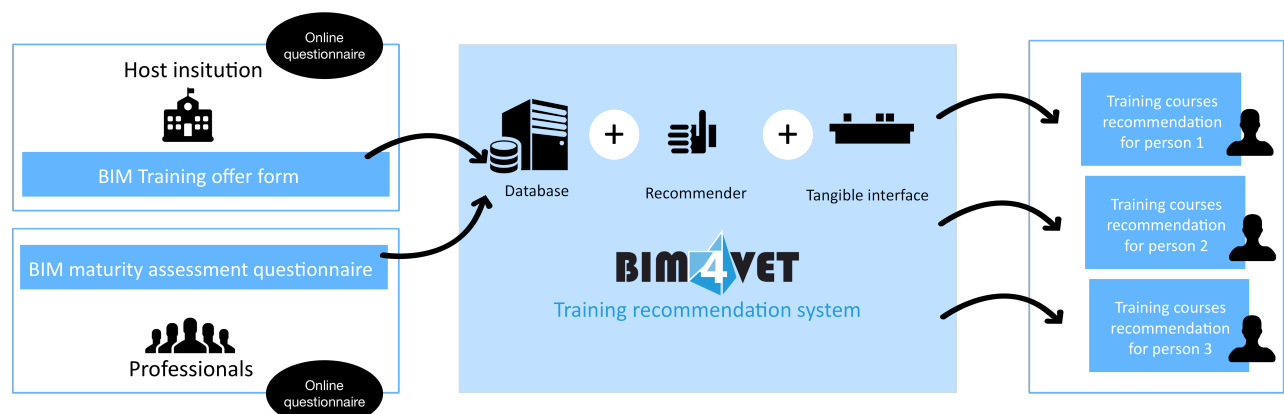
- **Professionals in the construction industry** (architects, design engineers, construction and civil engineers, mechanical, electrical and plumbing services (MEP) engineers, heating, ventilation and air-conditioning (HVAC) engineers, construction economists, surveyors, technicians, contractors, subcontractors, fabricators and manufacturers, project managers, facilities and operations managers (FM & OM), quantity surveyors, cost and legal consultants....).
- **Students and candidates in engineering, architecture and in related scientific disciplines;** mainly this targeted group is related to the training offers with university diploma issuance.

## 4. Links between BIM actor competence matrix and BIM curricula

### General principle

The schema below presents the concept of the BIM4VET application (see Figure 7).

- 1) The BIM training offer based on an online questionnaire allows feeding the BIM training course database.
- 2) The professionals can access a web-based platform to create their profile and configure the requirements related to the project or the team (see deliverable of the IO3). The data feed the database.
- 3) The BIM4VET application (including the recommender (see IO4 for more details) and a tangible table (see IO5 for more details)) is then used to configure the filters, access to the recommended training courses and select the courses that the users want to attend.



**Figure 7. Principle of the BIM4VET application**

In order to make the training courses “recommendable” by the system, the researchers propose to describe the training course by using the 25 BIM responsibilities. For each training course, the contribution to these BIM responsibilities is evaluated by using the Dreyfus scale (i.e. from novice to

expert) to qualify the training course prerequisites and the learning outcome. The level novice is associated to the value 1 until the value 5 for the level expert. The level 0 means that the BIM responsibility is not treated by the training course. The table below presents an extract of the xls file dedicated to the data collection.

	BIM responsibilities level > Prerequisite/Learning outcome (value 0-5; value 0-5)									
Title	Ensure compliance to project standards	Ensure compliance to corporate standards	Ensure compliance to relevant national and international standards	Coordinate the different BIM authors junior/ senior outputs to ensure the good quality and compliance of the model according to the BIM Project Execution Plan/ BIM Protocol/client's requirements	Supervise Clash detection, reporting and resolution	Address immediate software issues and support the upskilling of staff	Ensure Implementation of BIM software	Define & maintain project standards	Agree software solutions to be implemented	Define project outputs, according to the clients requirement
BIM Level 2 for Information Managers (formerly BIM PIM TIM)	1;2	1;2	1;2	1;2				1;2		1;2

Figure 8.View of the xls file for data collection.

The Dreyfus scale corresponds to this scale defining all the categories from novice to expert, see table below from Eraut [11].

Table 14 The 5 stages of skill acquisition (Michael Eraut, 1994)<sup>1</sup>

Stage	Definition
0 – None	No taught or earned knowledge relevant to the specified task
1 - Novice	Rigid adherence to taught rules or plans with no exercise of "discretionary judgement"
2 - Advanced Beginner	Limited "situational perception" and all aspects of work treated separately with equal importance
3 - Competent	The ability to "cope with crowdedness" (multiple activities, accumulation of information), some perception of actions in relation to goals, adopts deliberate planning of task execution and formulates routines to recursively execute task effectively
4 - Proficient	Has a holistic view of a situation, prioritizes importance of aspects, "perceives deviations from the normal pattern", employs maxims (ground rules or subjective principles of action) for guidance, with means that can adapt to the situation at hand.
5 - Expert	Ability transcends reliance on rules, guidelines, and maxims, has an "intuitive grasp of situations based on deep, tacit understanding". Has "vision of what is possible" and uses "analytical approaches" in new situations or in case of problems

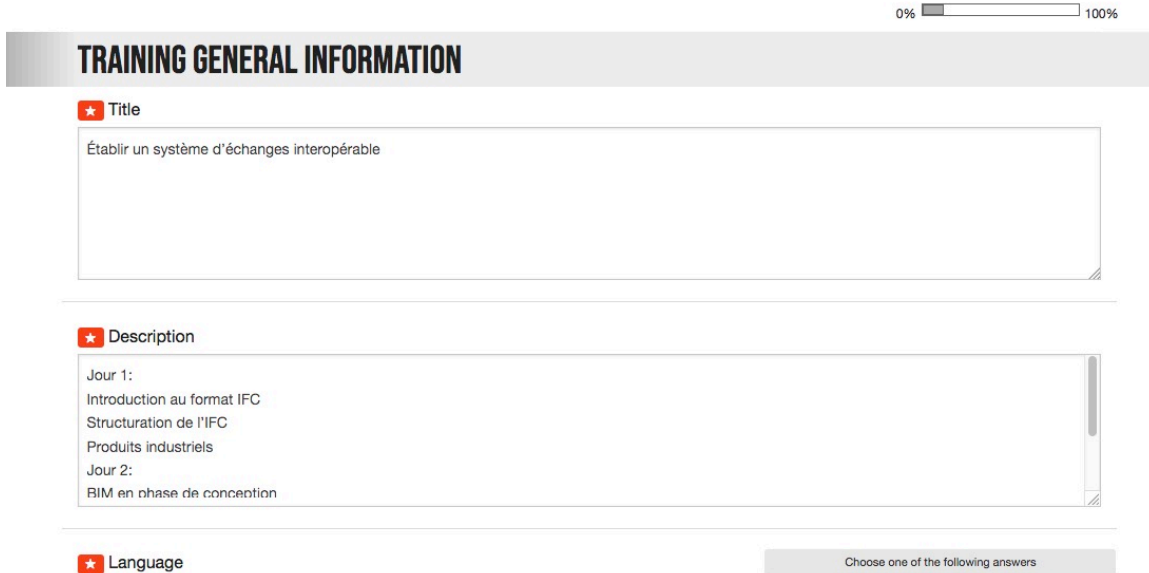
In order to affect the level of expertise to the BIM training offer, the researchers have consulted the data available on the Web presenting the course. This process is limited because the weighting is made based on the duration, and the keywords presented in the description rests at the appreciation of the reviewer who has just a few information at his disposal. In the prospect of the BIM4VET, we expect that the process will be made in collaboration with the host institutions and be improved by a third party organization that will be able to access the detailed information of the training course and ensure an homogeneity of the assessment.

<sup>1</sup> Source: [https://en.wikipedia.org/wiki/Dreyfus\\_model\\_of\\_skill\\_acquisition](https://en.wikipedia.org/wiki/Dreyfus_model_of_skill_acquisition), the level 0 has been proposed for the BIM4VET framework.



The process of weighting is complicated, principally due the fact that the training offer does not rely on the BIM4VET competence matrix. If in the future, more training are developed based on this matrix, the exercise will made in the early step of the training course development.

Finally, a survey questionnaire has been developed with LimeSurvey in order to facilitate the data collect. The screenshot below presents two sections of the questionnaire.



0% 100%

### TRAINING GENERAL INFORMATION

★ Title

Établir un système d'échanges interopérable

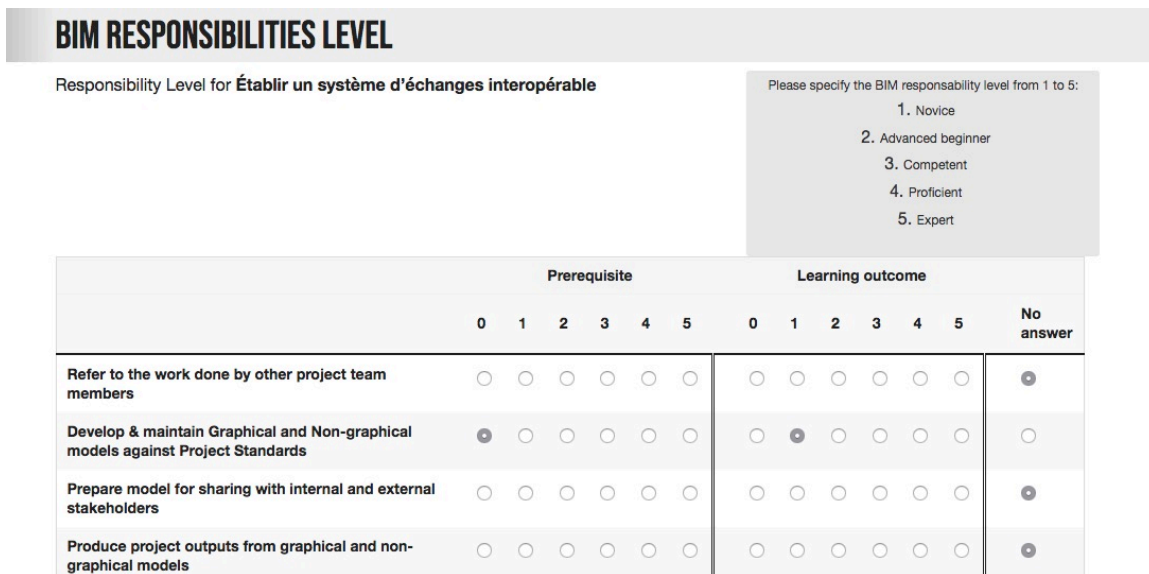
★ Description

Jour 1:  
Introduction au format IFC  
Structuration de l'IFC  
Produits industriels  
Jour 2:  
BIM en phase de conception

★ Language

Choose one of the following answers

Figure 9. Section “Training general information” of the LimeSurvey questionnaire



### BIM RESPONSIBILITIES LEVEL

Responsibility Level for **Établir un système d'échanges interopérable**

Please specify the BIM responsibility level from 1 to 5:

1. Novice
2. Advanced beginner
3. Competent
4. Proficient
5. Expert

	Prerequisite						Learning outcome						No answer
	0	1	2	3	4	5	0	1	2	3	4	5	
Refer to the work done by other project team members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Develop & maintain Graphical and Non-graphical models against Project Standards	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prepare model for sharing with internal and external stakeholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Produce project outputs from graphical and non-graphical models	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Figure 10. “BIM responsibilities” of the LimeSurvey questionnaire

## 5. Conclusion

This IO2 has contributed to three main objectives:

- 1) First draft of the BIM competence matrix that has been used during the Delphi Survey Method in collaboration with the expert panel.
- 2) Benchmark of the BIM training courses in EU.
- 3) Methodology for linking the BIM training courses with the BIM competence matrix and related data collection.

At this stage of the research work, the BIM competence matrix has been refined and validated by the expert panel during the Delphi Survey Method (see IO1). The list of BIM responsibilities and associated competencies of BIM actors should be considered as a dynamic (i.e. not fixed) list, which allows responding to major changes in the occupational field of BIM actors by adding or removing areas. Indeed the BIM roles are new roles in the AEC activity and will have to evolve in the future in order to answer to the new challenges that will be the one of the construction sector. They are currently described in such a way that they have to promote mutual understanding between stakeholders: BIM actors, VET and HE organisations, and other interested parties. This BIM competence matrix has already been used by the OAI (Ordre des Architectes et Ingénieurs-Conseils, LU) and the House of Training (LU) for the Luxembourgish BIM training offer.

Then, the BIM training courses benchmark allowed having a first view of the BIM training offer in EU. This exercise should be done regularly to be sure that all the data within the database are updated. Moreover, the offer is currently expanding and the use of the BIM4VET competence matrix should positively contribute to the development of this new offer.

Finally, the weighting process linked to the BIM training courses and the BIM responsibilities relies now on the available information on the website and on the appreciation of the reviewer. At more long term, the researchers expect that the process will be supervised by a third-party organisation, in order to ensure the homogeneity of the assessment. Discussions are currently open and go in that direction.

## 6. Bibliography

- [1] L.W. Anderson, D.R. Krathwohl, A Taxonomy for Learning, Teaching and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives: Complete Edition, Longman, New York, 2001.
- [2] M.B. Barison, E.T. Santos, "The competencies of BIM specialists: a comparative analysis of the literature review and job ad descriptions, in: , in: Y. Zhu, R.R. Issa (Eds.), Int. Work. Comput. Civ. Eng. , 2011, pp. 594–602.
- [3] B.S. Bloom, M.D. Engelhart, E.J. Furst, W.H. Hill, D.R. Krathwohl, Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain. , David McKay Company, New York, 1956.
- [4] Bouw Informatie Raad, BIR Leaflet Number 3: BIM Roles and Competences, 2015.
- [5] A. Bradley, H. Li, R. Lark, S. Dunn, BIM for infrastructure: An overall review and constructor perspective, Autom. Constr. 71 ( 2016) 139–152.
- [6] BuildingSMART, BuildingSMART, "Professional Certification - buildingSMART", Vol. 05-Apr-2018.
- [7] CIC Research Group, P. S. U. Department of Architectural Engineering, BIM Maturity Tool - BuildingSMART.
- [8] R.L. Cluster, J.A. Scarcella, B.R. Stewart, The Modified Delphi Technique - A Rotational Modification, Journal of Vocational and Technical Education 15 (2) (1999) 50–58.
- [9] Construction Industry Council, BUILDING INFORMATION CIC / BIM Protocol, (2013).
- [10] H.L. Dreyfus, S.E. Dreyfus, Mind over Machine: the power of human intuition and expertise in the age of the computer, Basil Blackwell, Oxford, 1986.
- [11] M. Eraut, Developing professional knowledge and competence, Routledge, 1994.
- [12] M. Gathercole, N. Thurairajah, The influence of BIM on the responsibilities and skills of a project delivery team, International Conference on Construction in a Changing World, Heritance Kandalama, Sri Lanka, 2014.
- [13] C.-C. Hsu, B.A. Sandford, The Delphi Technique: Making Sense of Consensus, Pract. Res. Eval. 12 (10) (2007).
- [14] W. Kymmell, Building Information Modeling: Planning and Managing Construction Projects with 4D CAD and Simulations, McGraw Hill Construction, 2008.
- [15] K. Luomi-Messerer, Using the VQTS model for mobility and permeability, 2009.
- [16] OmniClass, OmniClass Table 32 - Services.
- [17] S. Race, BIM Demystified, RIBA Publishing, 2013.
- [18] S. Sanghi, The Handbook of Competency Mapping: Understanding, Designing and Implementing Competency Models in Organizations, 3rd ed. Sage Publications Ltd, 2016.
- [19] B. Succar, BIM Dictionary.
- [20] B. Succar, BIME Initiative - 201in-Competency-Table V1.4, bimexcellence.org, 2016.
- [21] B. Succar, W. Sher, A Competency Knowledge-Base for BIM Learning, Australasian Journal of Construction Economics and Building - Conference Series 2 (2) (2014) 1-10.
- [22] B. Succar, W. Sher, A. Williams, An integrated approach to BIM competency assessment, acquisition and application, Autom. Constr. 35 (2013) (2013) 174–189.
- [23] R.A. Voorhees, "Competency-Based Learning Models: A Necessary Future," New Dir. Institutional Res. 2001 (110) (2001) 5-13.
- [24] M.I. Yousuf, Using experts' opinions through Delphi technique, Pract. Assessment, Res. Eval. 12 (4) (2007).

Additional Web sources used for determining the BIM responsibilities:

<http://objectif-bim.com/index.php/emploi-bim/le-bim-manager>  
<http://www.leguiddesmetiers.com/metiers/bim-manager-/3728>  
<https://bimftp.com/decouvrir-le-bim/le-metier-de-bim-manager/>  
<https://www.goconstruct.org/construction-jobs/career-explorer/bim-manager/>  
<http://blog.archipad.com/2016/02/04/bim-nouveaux-metiers-nouvelles-formations/>  
[http://www.opp.psu.edu/planning-construction/design\\_and\\_construction\\_standards/division-00-procurement-and-contracting-requirements/documents/opp-bim-plan-template](http://www.opp.psu.edu/planning-construction/design_and_construction_standards/division-00-procurement-and-contracting-requirements/documents/opp-bim-plan-template)

[http://www.engr.psu.edu/ae/cic/bimex/downloads/BIM%20Project%20Execution%20Planning%20Templates/05a\\_BIM\\_PXP\\_TEMPLATE\\_V1.1.doc](http://www.engr.psu.edu/ae/cic/bimex/downloads/BIM%20Project%20Execution%20Planning%20Templates/05a_BIM_PXP_TEMPLATE_V1.1.doc)  
<https://bimftp.com/decouvrir-le-bim/le-metier-de-bim-modeleur/>  
<https://www.goconstruct.org/construction-jobs/career-explorer/bim-technician/>  
[http://www.greenskillsproject.eu/images/results/en/Skills\\_Profile\\_File.pdf](http://www.greenskillsproject.eu/images/results/en/Skills_Profile_File.pdf)  
[http://www.engr.psu.edu/ae/cic/bimex/downloads/BIM%20Project%20Execution%20Planning%20Templates/05a\\_BIM\\_PXP\\_TEMPLATE\\_V1.1.doc](http://www.engr.psu.edu/ae/cic/bimex/downloads/BIM%20Project%20Execution%20Planning%20Templates/05a_BIM_PXP_TEMPLATE_V1.1.doc)  
<http://objectif-bim.com/index.php/emploi-bim/le-coordonateur-bim>  
<https://bimftp.com/decouvrir-le-bim/le-metier-de-bim-coordonateur/>  
[http://aucache.autodesk.com/au2011/sessions/4436/class\\_handouts/v1\\_DL4436\\_Joseph\\_BIM\\_Titles\\_Job\\_Descriptions\\_JJ.pdf](http://aucache.autodesk.com/au2011/sessions/4436/class_handouts/v1_DL4436_Joseph_BIM_Titles_Job_Descriptions_JJ.pdf)  
<http://www.bouwinformatieraad.nl/wp-content/uploads/2015/09/Kenniskaart-3-BIM-Roles-and-Competences-ENG.pdf>  
<http://www.bimthinkspace.com/2012/08/episode-17-individual-bim-competency.html>  
[http://www.engr.psu.edu/ae/cic/bimex/downloads/BIM%20Project%20Execution%20Planning%20Templates/05a\\_BIM\\_PXP\\_TEMPLATE\\_V1.1.doc](http://www.engr.psu.edu/ae/cic/bimex/downloads/BIM%20Project%20Execution%20Planning%20Templates/05a_BIM_PXP_TEMPLATE_V1.1.doc)

## 7. Annexes

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See below the tables related to the training benchmark.

Name of the organisation	Country	Language	Contact information	Name of the training	Bim Level	Training Description	Duration	Price	Online / On site	- Certification - No Certification - EQF Lvl	Requirement	What will you learn ?	Opens to	Target	Partnership
UCL et ECAM	Belgique	Français	Téléphone : 010/47.91.23 certificat-bim@uclouvain.be	BIM, conception et gestion intégrées		<p>un nouveau certificat d'université en « BIM (Building Information Modeling), conception et gestion intégrées ».</p> <p>Les atouts du programme :</p> <p>Obtenir une reconnaissance professionnelle grâce à la délivrance d'un certificat universitaire</p> <p>Bénéficier des compétences et des retours d'expériences d'enseignants académiques et d'intervenants issus du monde professionnel venant de Belgique et de l'étranger</p> <p>Participer à une démarche de travail collaboratif avec les différents participants à la formation</p> <p>Concevoir de façon intégrée un projet de construction, lors d'ateliers pratiques, en prenant en compte les contraintes et spécificités des différents acteurs</p>	2 semaines	2650 3500	On site	Certificat universitaire	<p>Les candidats :</p> <p>doivent être titulaires d'un des diplômes suivants :</p> <p>Master ingénieur civil des constructions</p> <p>Master ingénieur civil architecte</p> <p>Master ingénieur industriel en construction</p> <p>Master ingénieur industriel géomètre</p> <p>Master en architecture</p> <p>auront une connaissance minimum d'un logiciel métier ou s'engagent à l'acquérir en cours de formation (exemple: Revit, Archicad, Tekla,...)</p> <p>doivent également avoir une connaissance active du français et passive (lecture) de l'anglais.</p>	<p>de comprendre le processus de passage d'une organisation de travail classique à une nouvelle méthodologie de type collaboratif avec l'usage d'une maquette numérique BIM;</p> <p>d'évaluer l'intérêt et le potentiel que peut représenter le recours au BIM pour sa profession et d'évaluer les risques éventuels;</p> <p>d'appréhender les impacts du BIM sur les pratiques contractuelles (aspects juridiques);</p> <p>d'assurer la gestion au quotidien d'un projet BIM;</p> <p>de comprendre les principales technologies disponibles pour les différentes phases du projet (conception, réalisation, cycle de vie), de sélectionner la technologie adéquate pour son activité et d'utiliser les outils pour toutes les phases du projet.</p>		<p>Les personnes exerçant la profession d'architecte ou d'ingénieur de bureau d'études ;</p> <p>les maîtres d'œuvre ;</p> <p>les maîtres d'ouvrage public ou privé ;</p> <p>les gestionnaires de grands ensembles, du secteur privé ou du secteur public ;</p> <p>les entrepreneurs (ingénieurs, gestionnaires de chantier,...);</p>	Eurometropolitan e-Campus Centre Scientifique et Technique de la Construction (CSTC)

Name of the organisation	Country	Language	Contact information	Name of the training	Bim Level	Training Description	Duration	Price	Online / On site	- Certification - No Certification - EQF Lvl	Requirement	What will you learn ?	Opens to	Target	Partnership
Technical University of Denmark	Denmark	English	(+45) 4525 1658	Advanced Building Information Modeling		The general course objective is to give the participants a deeper understanding of the main factors that characterize the vision of digital building models and the integration of the overall construction process (integrated BIM/VDC). Analyze and develop 3D models and object-oriented methods for data representation, data exchange, simulation and communication in a project. The course focuses on analyzing and applying model-based methods and tools that forms the future building processes, as well as to evaluate the potentials and barriers in the implementation of BIM.	13 weeks		On site	MSc Taught under single-course student	The course is based on previous courses 11031 and 11952.	Analyse and apply tools and methods for project collaboration, data exchange and project coordination Interpret and evaluate a parametric modeling concept importance of a future 3D object-oriented workflow Apply a neutral common format as exchange format between applications and the project partners for interoperability Perform and analysis of and use construction classification and other standards, national and international, for data exchange and data reuse Develop built applications for the generation of complex parametric building structures and components using visual programming. Perform simulations of building models and building entities within a professional domain Analyse and evaluate objectoriented working methods impact on the integration in the building process Analyse building processes and specify requirements for input and output in an integrated process flow Evaluate the potentials in a BIM working method and the barriers in the implementation of BIM Produce a report of an academic issue addressed at the course		Civil Engineering Architctural students	
	Denmark	Danish	(+45) 4525 1658	Videregående BIM for bygningsdesign  Advanced BIM for architectural engineering		The overall goal is to provide building design students a variety of specialized methods and tools in Building Information Modeling (BIM), which can be used to solve more complex tasks in a design and engineering context. The subject areas are: Analysis and modeling of complex geometry and form; Parametrics in building construction; Visual programming of parametric systems and structures, 3D printing of presentation and 3D animations. Finally there is a specific design task within the area of the course.	The course is not following DTUs normal Schedule		On site	Bachelor Diplomingeniør	The course is based on previous courses 11951 and 11952	Analyzing complex geometry in different scales, building systems and building components Developing models of complex structures and elements from the construction domain Analyzing parametrien with relations and constraints in an existing and in an imaginary building construction Creating digital parametric building structures using tools for visual programming Creating physical models through 3D printing of digital models Creating animations which describes bygningsobjekters structure, form and function Developing a concrete designs project using the methods, techniques and tools that are introduced on the course Making presentation and communication of projects and solutions through models, visualizations, charts and other media		Student	

Name of the organisation	Country	Language	Contact information	Name of the training	Bim Level	Training Description	Duration	Price	Online / On site	- Certification - No Certification - EQF Lvl	Requirement	What will you learn ?	Opens to	Target	Partnership
Oger Institut	France	Français	OGER INTERNATIONAL 70 rue Saint Denis 93400 SAINT-OUEN 01 58 79 12 34	BIM 1 jour pour tout comprendre		Formation 1 journée 1/ Appréhender le BIM dans toutes ses dimensions 2/ Comprendre le changement généré par le BIM 3/ Définir sa stratégie d'intégration	1 jour	500 €	On site	Formation qualifiante	Connaître le process d'un projet de construction	1/ Comprendre ce qu'est et sera le BIM 2/ Identifier l'impact, la valeur ajoutée et les freins du passage au BIM 3/ Elaborer son plan d'action en se posant les questions adéquates pour une intégration du BIM adaptée à son métier et à son organisation		Maîtres d'ouvrage Maîtres d'œuvre BET Entreprises Exploitants	
Ecole d'ingénieurs CESI	France	Français	01 55 17 80 10	Management de projets de Construction option: BIM et maquette numérique		1 semaine en formation contre 3 semaines en entreprise (12 ou 18 mois) 1/ Former des cadres managers de projets 2/ Former des cadres dotés de qualités humaines et de communications développées leur permettant des équipes multiculturelles 3/ Identifier et maîtriser les aspects juridiques et réglementaires liés à l'urbanisme et à l'aménagement dans un projet de construction en France ou dans un contexte international 4/ Option BIM permet de piloter tous types de projets de construction sur l'ensemble du cycle de vie du projet et de développer une stratégie de gestion de projet	12 ou 18 mois	13.440 €	On site	Master spécialisé	1/ Bac +5 (Ingénieur, Master M2) ou équivalent 2/ M1 avec 3 années d'expérience professionnelle 3/ Demande de dérogation	1/ Environnement du BIM, outils et réglementations 2/ Stratégies et développemnt du BIM 3/ Management du projet (gestion de la maquette numérique et de ses données, spécificités du pilotage d'un projet BIM)	Avoir des carrières comme: Responsable ou Chef de projets BIM et maquette numérique Responsable BIM et maquette numérique BIM Project Manager BIM Manager	Ingénieurs	1/ Union des Grandes Ecoles Ingénieurs 2/ Commision des titres d'Ingénieurs 3/ European Accreditation of Engineering Programmes
CESI entreprises	France	Français	01 55 17 80 00	Coordinateur BIM		Formation	10 jours	3.300 €	On site	Formation qualifiante	Connaissances de coordination des projets	1/ Gérer une ou plusieurs cellules de modélisateurs BIM et mettre en œuvre le process BIM de l'entreprise 2/ Concatener les maquettes et vérifier les collisions et faire la synthèse et l'interface des maquettes 3/ Garantir la pérennité et la qualité de l'information dans la chaîne de production		Personnes maîtrisant la conception de projet DAO en 2D	
	France	Français	01 55 17 80 00	Modélisateur BIM		Formation essentiellement sur les logiciels Revit et Navisworks et selon demande et besoin	10 jours	2.100 €	On site	Formation qualifiante	Connaissances de modélisation des projets	1/ Modéliser les données en 3D avec une approche monodisciplinaire sur différents projets 2/ Enrichir la maquette au quotidien		Personnes maîtrisant la conception de projet DAO en 2D	
	France	Français	01 55 17 80 00	Chef de projet BIM		Formation	12 jours	3.900 €	On site	Formation qualifiante	Connaissances de gestion des projets	1/ Décliner la stratégie BIM, la synergie et la collaboration entre les acteurs internes et externes 2/ Piloter un ou plusieurs projets en s'appuyant sue le process et en intégrant la stratégie et la technologie BIM		Personnes ayant mener un pilotage de projet et conduit une opération de travaux	
L'Ecole des Grands Projets Paris (ESTP) Ecole nationale des ponts et chaussées Paris (ENPC)	France	Français	06 14 18 20 25	Mastère Spécialisé® BIM : conception intégrée et cycle de vie du bâtiment et des infrastructures		À l'heure où de nouvelles directives européennes sont adoptées pour encourager, voire rendre obligatoire l'utilisation du BIM pour les marchés publics de BTP, il apparaît que le développement de l'usage de la maquette numérique nécessite une profonde transformation des compétences et des modes de coopération des acteurs de la construction. L'Ecole des Ponts ParisTech et l'Ecole Spéciale des Travaux Publics, du bâtiment et de l'industrie, créent un Mastère Spécialisé® en association avec Arts et Métiers ParisTech, l'Ecole Nationale des Sciences Géographiques, le Centre Scientifique et Technique du Bâtiment, les écoles d'Architecture de Marseille, Toulouse et Paris Val-de-Seine et ECOTEC	400 heures	13.750 €	15% online et le reste on site	Master spécialisé	Cadres en poste et des jeunes diplômés de niveau Bac+5	1/ Former des professionnels à manager un projet dans un contexte de maquette numérique 2/ Utiliser le BIM pour concevoir de façon intégrée des projets de construction et d'exploitation de bâtiments neufs, existants, ou de rénovation 3/ Aider les différents professionnels à « travailler ensemble »	Cette formation offre des débouchés au sein d'organisations telles que des investisseurs et gestionnaires de parc immobilier, des établissements financiers, des maîtres d'ouvrage, des agences d'architecture, des bureaux d'études, des entrepreneurs du bâtiment et des travaux publics, des producteurs et négociants de matériels et matériaux, des exploitants, des utilisateurs	Architectes, Ingénieurs d'études, Maîtres d'œuvre, Conducteurs d'opération, Economistes de la construction, Géomètres, Maîtres d'ouvrage public et privé, Assistants maître d'ouvrage, Chefs de produits industriels, Exploitants, BIM managers, Directeurs de synthèse	1/ Médiacconstruct 2/ La Fédération des syndicats des métiers de la prestation intellectuelle et du Numérique (CINOV) 3/ L'Union Nationale des Syndicats Français d'Architectes (UNSA) 4/ L'Union nationale des Economistes de la construction (UNTEC), 5/ SYNTEC Ingénierie et Entreprises Générales de France BTP (EGF-BTP).
ESTP	France	Français	01 75 77 86 08	Le projet en BIM		Une formation 100% opérationnelle avec la totalité des interventions proposées sous forme d'ateliers pratiques dans la salle BIM de l'ESTP Paris. Un rythme adapté permettant d'allier l'apprentissage et l'activité professionnelle. l'expérience et la diversité des participants représentant les différents acteurs de la filière	150 heures	10.000 €	- atelier participatif appliqué à un projet - pédagogie innovante avec plateforme d'échange et cours enregistrés pour revivre l'atelier en replay	Formation qualifiante		1/ savoir échanger, maîtriser les processus BIM sur tout le cycle de vie du bâtiment 2/ savoir modéliser un projet de construction et maîtriser les différents logiciels de la maquette numérique 3/ gérer, sur la base d'une méthodologie de management un projet BIM		Dessinateurs-projeteurs, conducteurs de travaux, techniciens et cadres issus d'entreprises, de maîtrises d'œuvre et de maîtrises d'ouvrage.	SIGHTLINE GROUP
CSTB Formations	France	Français	01 40 50 28 61	Les fondamentaux du BIM dans le bâtiment		Le développement du BIM et de la maquette numérique dans le bâtiment nécessite une profonde transformation des compétences et des modes de coopération de la filière. Il est donc essentiel avant tout démarrage d'un projet d'en identifier les enjeux, techniques, économiques, organisationnels et ce à toutes les phases d'un projet de construction et pour l'exploitation d'un bâtiment dans une perspective de valorisation de patrimoine.	1 jour	755 €	On site	Formation qualifiante		Expliquer le BIM à travers ses trois concepts de base dans le cadre d'un projet de construction Identifier les caractéristiques BIM et les gains apportés par le processus dans la réalisation d'ouvrages Connaître les principes de la prescription, de la conduite des projets en BIM Définir la manière dont le DOE Numérique doit être réalisé du point de vue de la technique de la modélisation		Architecte - AMO - Ingénieur - Economiste - Maître d'ouvrage	
	France	Français	+33(0)164 688 436	Construire un e-catalogue avec le BIM		Le marché de la construction numérique est en plein essor et les acteurs industriels se mobilisent pour soutenir les concepteurs de bâtiments. Comment dématérialiser vos produits ?  Comment intégrer vos données produits dans le processus de prescription ? Comment réaliser un e-catalogue ?	2 jours	1.255 €	On site	Formation qualifiante		partager une vision claire de l'évolution des enjeux du BIM pour l'industrie comprendre le développement des échanges numériques concevoir une stratégie pour de nouveaux outils de prescription préparer son entreprise à la dématérialisation de données produits et systèmes			
	France	Français	01 40 50 28 61	Mettre en place une démarche collaborative avec le BIM		La maquette numérique (BIM) joue un rôle central dans le secteur du bâtiment. En effet, elle permet d'aborder l'acte de construire d'une façon adaptée aux enjeux complexes et pluridisciplinaires de la construction durable et ce à travers une démarche collaborative entre les acteurs depuis la conception jusqu'aux chantiers et l'exploitation.	3 jours	1.595 €	On site	Formation qualifiante	Maîtriser la gestion d'un projet de construction, avoir une connaissance des enjeux du BIM ou avoir suivi le stage «Fondamentaux du BIM dans le bâtiment » (BIM1)	de comprendre comment mettre en place ou participer à une organisation multi-acteurs autour du BIM d'expérimenter des pratiques de travail collaboratif autour du BIM de prendre conscience de l'importance de l'interopérabilité pour la fluidification des échanges d'information entre les logiciels de poser les enjeux entre standards de fait et de droit, entre standards ouverts et solutions propriétaires		Maîtres d'ouvrage : Gestionnaires de patrimoine – Bailleurs sociaux Maîtres d'œuvres : BIM manager – Architectes – Bureaux d'études et d'ingénierie - AMO - Economistes de la construction Exploitants Entreprises de construction Producteurs de logiciels Editeurs de logiciels	
	France	Français	01 40 50 28 61	Connaître les outils et logiciels interoperables avec le BIM		Le rôle du BIM est central dans le secteur du bâtiment car il permet d'aborder la construction d'une façon transverse et pluridisciplinaire. Pour parvenir à maîtriser l'offre logiciels qui se développe autour de cet axe, il est nécessaire d'en évaluer les capacités pour l'intégrer dans sa pratique.	1 jour	1.255 €	On site	Formation qualifiante	Avoir une connaissance des enjeux du BIM ou avoir suivi le stage « Fondamentaux du BIM dans le bâtiment » (BIM1)	de découvrir l'offre des outils logiciels autour du BIM d'aborder les différentes méthodologies afférentes de mettre en œuvre et d'exploiter des maquettes numériques BIM		Maîtres d'œuvre : BIM manager Architectes Ingénieurs de conception Economistes de la construction Chefs de programme Responsables de Bureaux d'études et d'ingénierie Dessinateurs	
	France	Français	01 40 50 28 61	Règles juridiques et responsabilités dans un projet BIM		Le recours au BIM (Building Information Modeling) marque une évolution dans les méthodes de travail traditionnelles d'une opération. Ces évolutions vont notamment impacter :  le contenu et les conditions d'exécution des prestations nécessaires à la conception et à la réalisation du projet telles qu'elles sont habituellement pratiquées ainsi que les interactions entre les intervenants et leurs responsabilités respectives. Quelles sont les conséquences juridiques d'une opération en BIM ? Comment les rapports contractuels entre les acteurs d'une opération menée en BIM doivent-ils évoluer ?	1 jour	1.255 €	Formation en ligne et on site	Formation qualifiante	Aucun	d'identifier les impacts de l'utilisation de la maquette numérique BIM sur le contenu et les conditions d'exécution des missions des acteurs d'une opération de construction de connaître les outils et les méthodes permettant d'adapter les pratiques contractuelles traditionnelles d'acquérir des réflexes de vigilance sur certains sujets ou domaines particuliers		Maîtres d'Ouvrage : Gestionnaires de parcs immobiliers Bailleurs sociaux Exploitants Maîtres d'Ouvre : Bureaux d'études et ingénieurs conseils Architectes Bureaux Contrôles Entreprises de batiment Industriels	
	France	Français	01 40 50 28 61	Développer les interfaces IFC dans le cadre d'un projet BIM		Au moment où le BIM et son standard IFC vont devenir obligatoires dans les marchés publics de construction, ce stage permet de se préparer au développement des interfaces réglementaires qui seront exigées par les utilisateurs des logiciels.	2 jours	1.225 €	On site	Formation qualifiante	Avoir des connaissances générales du bâtiment et maîtriser la modélisation objets, CAO et le langage C++	de comprendre les principes du BIM d'acquérir les connaissances nécessaires pour passer au « BIM IFC » et d'en connaître les principaux mécanismes : de créer et maîtriser l'interface de lecture / écriture de fichiers au format IFC de comprendre les principes de validation et de certification des interfaces IFC d'établir une stratégie de développement des interfaces IFC en relation avec les principaux autres outils BIM du marché.		Développeurs et éditeurs de logiciels	



France	Français	01 40 50 28 61	Gérer un parc immobilier en utilisant le BIM		La démarche BIM se diffuse dans des marchés privés et des marchés publics. Elle peut être un atout de croissance majeur, notamment lorsqu'elle est intégrée dans la totalité de la durée de vie du bâtiment. Aujourd'hui, après le lancement des opérations, les maîtres d'ouvrage se préparent à la réception des maquettes numériques, cela présage le développement de compétences internes et externes dans la gestion technique et patrimoniale en utilisant le BIM	2 jours	1.255 €	On site	Formation qualifiante	Maîtriser la gestion d'un projet de construction, avoir une connaissance des enjeux du BIM ou avoir suivi le stage « Fondamentaux du BIM dans le bâtiment » (BIM1)	comprendre l'utilisation du BIM pour la gestion d'un patrimoine immobilier mono ou multi site gérer le flux de production des données tout au long du projet, de la programmation à la livraison structurer les données pour la gestion de patrimoine à travers des outils numériques définir les systèmes d'information dans le long terme et mettre à jour les bases de données		Maîtres d'ouvrage : Gestionnaires de patrimoine Baillleurs sociaux Collectivités publiques : services techniques et services de gestion Gestionnaires de co-propriétés	
France	Français	01 40 50 28 61	Elaborer une maquette numérique d'un bâtiment existant		Le secteur des bâtiments existants constituant l'essentiel du parc de bâtiments, l'arrivée de nouvelles technologies, de nouveaux process et de nouveaux outils permet de numériser les bâtiments, de les modéliser puis de les intégrer à la maquette numérique et au processus BIM. Ces outils, notamment les scanners 3D, permettent une acquisition rapide et exhaustive des données géométriques de l'existant.	2 jours	1.255 €	On site	Formation qualifiante	- Notions 3D de base - Principes généraux du BIM	De découvrir les différents outils de numérisation 3D D'appréhender les étapes de la numérisation d'un bâtiment existant De découvrir comment établir la maquette numérique d'un bâtiment existant à partir de sa numérisation 3D		Maîtres d'œuvre : Bureaux d'études et d'ingénierie Architectes AMO Maîtres d'ouvrage publics et privés Entreprises	
France	Français	01 40 50 28 61	Le BIM à l'échelle de la ville		Devant la complexité des projets (sécurité, confort, performances, délais, coûts...), les méthodes traditionnelles (plans et documents) atteignent leurs limites. Partager, consolider, analyser et exploiter des données complexes dans une maquette numérique urbaine permet de centraliser et capitaliser des informations actualisées ; ce qui constitue un atout considérable pour une approche systémique des projets urbains.	1 jour	755 €	On site	Formation qualifiante	Maîtriser la gestion d'un projet de construction, avoir une connaissance des enjeux du BIM à l'échelle du Bâtiment ou avoir suivi le stage « Fondamentaux du BIM dans le bâtiment » (BIM1)	Comprendre l'utilité du BIM dans un projet d'aménagement Appréhender les étapes de mise en œuvre d'une maquette numérique urbaine		Maîtres d'ouvrage : Conseil régionaux, Sem, Gestionnaires de parc privés et publics Exploitants Maîtres d'œuvre : Urbanistes Economistes de la construction BIM manager AMO Architectes Bureaux d'études et d'ingénierie	
France	Français	01 40 50 28 61	Maîtres d'ouvrage : élaborer un cahier des charges BIM		Le BIM se déploie dans la filière du bâtiment très rapidement. Les maîtres d'ouvrages, acteurs clé de la commande, sont en première ligne, car ils doivent lancer des projets de construction sous la démarche BIM. Pour éviter les écueils de la mise en place d'un nouveau dispositif, nous proposons aux maîtres d'ouvrage de compléter leur formation d'introduction (BIM1) avec une formation d'application pour le lancement de projets en BIM.	2 jours	1.255 €	On site	Formation qualifiante	Maîtriser la gestion d'un projet de construction, avoir une connaissance des enjeux du BIM ou avoir suivi le stage « Fondamentaux du BIM dans le bâtiment » (BIM1)	de définir les objectif chiffrés nécessaires au déploiement d'une démarche BIM pour la construction d'un bâtiment d'identifier les implications du cahier de charges dans le programme technique détaillé de préciser les conditions contractuelles liées au cahier des charges BIM pour une marché de construction de rédiger la description des modèles et la charte graphique liées à la commande BIM pour la gestion du patrimoine		Maîtres d'ouvrage : Gestionnaires de patrimoine Baillleurs sociaux Collectivités publiques : services techniques et services de gestion Gestionnaires de co-propriétés	
France	Français	01 40 50 28 61	Entreprises: connaître les enjeux du BIM pour pouvoir le mettre en œuvre demain		Le développement du BIM et de la maquette numérique dans le bâtiment nécessite une profonde transformation des compétences et des modes de coopération de la filière. Il est donc essentiel avant tout démarrage d'un projet d'en identifier les enjeux, techniques, économiques, organisationnels et ce à toutes les phases d'un projet.	1 jour	755 €	On site	Formation qualifiante	Aucun	de définir le BIM : ses enjeux et ses principes d'organiser son équipe « projet » pour travailler sous une démarche BIM de mettre en place l'organisation nécessaire pour répondre à des appels d'offres BIM de choisir les outils informatiques adaptés à son activité.		Chefs d'entreprises Cadres dirigeants ou responsables des bureaux d'études internes aux entreprises	
France	Français	01 79 06 71 00	COMMENT UTILISER EFFICACEMENT LE BIM POUR VOS OPÉRATIONS DE CONSTRUCTION : Appréhender les modalités essentielles du BIM		Faire le point sur les enjeux managériaux, techniques et économiques dans l'utilisation du BIM dans vos projets de construction Maîtriser les modalités essentielles du BIM Bénéficier du retour d'expériences par la présentation des projets exemplaires	2 jours	1.794 €	On site	Formation qualifiante		Définition du BIM et échanges entre les équipes sur un projet de construction : Comment optimiser le BIM dans sa structure ? Comment constituer et enrichir sa bibliothèque ? Comment utiliser le BIM dans les relations aux autres acteurs du projet ? Les nouvelles relations à instaurer avec l'architecte et le thermicien, l'économiste ; Nouvelles répartitions des responsabilités liées au BIM Comprendre les enjeux et les outils existants du BIM Enjeux managériaux du BIM Impacts sur l'économie des projets Quelles sont les technologies utilisables : avantages et inconvénient s Quelles méthodes de production du BIM ? Comment exploiter les données Réaliser un BIM pour l'exploitation d'un ouvrage Quels sont les enjeux de l'utilisation du BIM en gestion de patrimoine immobilier ? Comment l'utiliser à l'issue des travaux ?		Maîtres d'œuvre et architectes et urbanistes ; Promoteurs immobiliers ; Maîtres d'ouvrage publics ou privés ; Directeur ; Cadres responsables des services Patrimoine, bâtiments travaux neufs au sein du secteur public (collectivités territoriales, administration centrale, établissements public de santé, etc.) ; Toute personne participant à un projet de construction	
France	Français	01 79 06 71 00	LE BIM POUR LA MAÎTRISE D'OEUVRE : Comprendre l'utilisation du BIM dans le processus de maîtrise d'œuvre		Comprendre le processus BIM appliqué aux missions des architectes Être aidé à la réflexion pour l'intégration des principes et des technologies BIM dans son métier Découvrir les relations entre les intervenants de la construction Appliquer la théorie BIM sur un exemple Devenir force de proposition sur le sujet du BIM au sein de sa structure	3 jours	2.274 €	On site	Formation qualifiante	Le stagiaire doit se munir d'un ordinateur sur lequel est installé le logiciel REVIT	Gérer l'information et la production ainsi que l'économie du projet, sur toutes ses phases Maîtriser les modifications systémiques et positives de l'acte de concevoir l'Architecture Fabriquer en BIM établir à travers les spécificités des membres de l'équipe un protocole de travail BIM, à partir d'une trame fournie par le formateur. Apporter un regard critique sur l'implémentation du protocole dans des cas différents, et transposée selon sa propre expérience concrète.	Devenir force de proposition sur le sujet du BIM au sein de sa structure	Architectes associés ; Responsables d'agence, ou responsables de projets ; BET ; Programmistes ; Economistes	
France	Français	01 79 06 71 00	MAQUETTE NUMÉRIQUE - MAÎTRISER LES ASPECTS JURIDIQUES ET PRATIQUES : Enjeux, responsabilités, perspectives dans le domaine du bâtiment et des ouvrages d'art		Comprendre les enjeux juridiques de la maquette numérique dans le domaine du BTP afin de mieux en maîtriser les risques Comprendre et définir les responsabilités des différents intervenants Acquérir les bons réflexes juridiques pour l'établissement des contrats et la protection de la propriété intellectuelle	1 jour	1.194 €	On site	Formation qualifiante		Définir la maquette numérique Identifier les différents types de responsabilités Cerner la maquette numérique à l'aune des droits de propriété intellectuelle Identifier les différents droits de propriété intellectuelle en présence Comprendre comment les protéger Comment en assurer leur transférabilité et sous quelles conditions	Acquérir les bons réflexes juridiques pour l'établissement des contrats et la protection de la propriété intellectuelle	Juristes et responsables juridiques confrontés à l'urgence de cet outil ; Ingénieurs, techniciens, architectes et responsables de projet qui souhaitent comprendre les enjeux juridiques de cet outil	
France	Français	01 79 06 71 00	DÉCOUVERTE ET PRISE EN MAIN DES LOGICIELS BIM : Maîtriser les bases garantissant la prise en main des logiciels BIM		Comprendre la différence entre les logiciels BIM et leurs applications Naviguer dans un logiciel de coordination de données BIM Connaitre les fonctionnements de base d'un logiciel de modélisation	2 jours	1.794 €	On site	Formation qualifiante	Le stagiaire doit se munir d'un ordinateur sur lequel est installé le logiciel REVIT	Présentation des outils de modélisation BIM Aperçu de ce qui fait en modélisation aujourd'hui Exploitation des nuages de points Gestion des informations Exploitation des données 4D, méthodes Prise en main de REVIT et de Navis Work (Freedom)		Conducteurs de chantiers ; Entreprises générales ; Fabricants ; Toute personne participant à un projet de construction ; Architectes associés ; responsables d'agence, ou responsables de projets ; BET ; Programmistes ; Economistes ; Maîtres d'ouvrages publics ; Directions immobilières ; Directions des Services Technique ; Promoteurs immobiliers et chargés d'opération	
France	Français	01 79 06 71 00	EXPLOITER VOS BÂTIMENTS PAR LE BIM : Comment optimiser la gestion des bâtiments grâce au BIM		Initier la mise en œuvre d'une démarche BIM au service de l'exploitation et de la maintenance du bâtiment Garantir une gestion rationnelle et optimisée des bâtiments Valoriser et faciliter l'échange entre les intervenants	1 jour	1.194 €	On site	Formation qualifiante		Comprendre les enjeux du BIM dans le bâtiment Comment utiliser le BIM en phase d'exploitation Les clés pour la mise en œuvre efficace du BIM en phase d'exploitation		Exploitants et Gestionnaires de patrimoine ; Maîtres d'ouvrage ; Maîtres d'œuvre ; Directions immobilières ; Directions des services techniques ; Directions des systèmes d'information	
France	Français	01 79 06 71 00	LES FONDAMENTAUX DU BIM : Comprendre les points clés du processus BIM		Comprendre les enjeux du BIM dans le bâtiment Définir le BIM d'un projet de bâtiment Exploiter le BIM pour un projet de bâtiment	1 jour	1.194 €	On site	Formation qualifiante		Comprendre l'intérêt du BIM Intégrer les mécanismes du BIM dans sa réalisation Identifier et cerner les différentes phases dans lesquelles s'inscrit le BIM Comment utiliser le BIM afin d'en tirer des avantages concrets		Conducteurs de chantiers et entreprises de construction ; Maîtrise d'ouvrage et gestionnaires de patrimoine ; Directions immobilières ; Directions des services techniques ; Directions des systèmes d'information	
France	Français	01 79 06 71 00	CURSUS MANAGEMENT DE PROJET EN BIM : Spécial maîtrise d'oeuvre - Niveau 2		Savoir jouer le rôle de BIM Manager Établir les cahiers des charges et protocoles d'échanges entre les partenaires Suivre et contrôler la mise en œuvre du travail collaboratif Certifier vos acquis en management de projet BIM	5 jours	4.194 €	On site	Formation qualifiante	Une première expérience sur un logiciel BIM est recommandée pour suivre cette formation. Des modélisations sur ordinateur portable sont prévues.	Gérer l'information et la production ainsi que l'économie du projet sur toutes ses phases Piloter un projet BIM : séquences, validation, suivi et communication Études de cas Organisation de la maquette numérique et gestion des données		Architectes associés ; Responsables d'agence ; Responsables de projets ; BET ; Programmistes ; Economistes ; Cette formation s'adresse à des professionnels expérimentés en BIM Management et pratiquant des logiciels BIM.	





	France	Français	01 40 27 24 21	Management de projet BIM		Maîtriser les outils de la maquette numérique et la gestion de projet BIM.			On site	Diplôme Universitaire	Licence d'architecture, Licence de génie civil, Admis en LP management de projet BIM, Professionnels du bâtiment	Moffier une maquette numérique et l'enrichir Extraire les données structurée à partir de la maquette numérique Créer des pièces graphiques 2D/3D à partir de la maquette numérique Utiliser la maquette numérique dans des logiciels professionnels		Licence d'architecture, Licence de génie civil, Admis en LP management de projet BIM, Professionnels du bâtiment	
	France	Français	01 40 27 24 21	Certificat professionnel Maquette numérique du bâtiment (BIM)		Acquérir les bases de la maquette numérique			On site	Formation qualifiante		Maîtriser le dessin assisté par ordinateur en 2D/3D. S'initier à la maquette numérique et au management de projet BIM	Technicien de bureau d'études bâtiment		
	France	Français	01 40 27 24 21	Maquette numérique		S'initier à la production et la modification de maquette numérique.			On site	Formation qualifiante	Il est recommandé de suivre également CCV113	Maîtriser les logiciels de maquette numérique ; Elaborer les méthodologies pour la modélisation et la génération des plans ; Gérer la collaboration autour de la maquette numérique ; Vérifier à la cohérence du projet.		Tous les professionnels du BTP Niveau : L1/L2	
ENSA Toulouse	France	Français	05 62 11 50 63	BIM ET NOUVELLES PRATIQUES DE COLLABORATION		<ul style="list-style-type: none"><li>• Expérimenter de nouvelles pratiques basées sur la maquette numérique : génération de documents, extraction d'informations, échanges et partage d'information sur le projet avec les autres intervenants</li><li>• S'affirmer comme le responsable naturel de la qualité du BIM d'un projet</li><li>• Créer et renforcer son réseau professionnel par de fructueuses collaboration</li><li>• Augmenter sa capacité de réponse aux nouvelles formes de commandes, pas de se perfectionner avec un outil particulier mais plutôt de découvrir certaines fonctions peu ou pas exploitées et notamment dans le contexte du travail collaboratif.</li></ul>	7 jours	1750	On site	Formation qualifiante		Le BIM pour l'architecte Le BIM et les bibliothèques d'objets Le BIM et la conception collaborative Le BIM pour l'exploitation Le BIM, territoires numériques Le BIM, nouveaux rôles, nouveaux métiers	Meilleure insertion dans la commande induite par les nouvelles méthodes de conception collaborative basées sur la maquette numérique	architectes, maîtres d'oeuvres, salariés des agences d'architecture	

Name of the organisation	Country	Language	Contact information	Name of the training	Bim Level	Training Description	Duration	Price	Online / On site	- Certification - No Certification - EQF Lvl	Requirement	What will you learn ?	Opens to	Target	Partnership
Politecnico di Milano - Scuola Master Fratelli Pesenti	Italy	English/Italian	<a href="tel:+390223994396">+39 02-2399.4396</a>	Bim Manager	Level 1 and 2	The training program is focused on BIM Training Managers and professionals in integrated projects . Starting from what is defined by the European Parliament on procurement (European Union Public Procurement Directive , EUPPD ) and the use of BIM in the design activities in the construction sector for public works made with funds from the European Union from 2016 , will make an excursus on the law , the processing of data , responsibilities , and will continue with a basic training on the use of some applications .	12 mois	6500 3500 (online)	On site / Online	Master	holding a Degree V.O. , Degree / Master N.Ö. in Engineering , Architecture and in related scientific disciplines	The basic training will allow you to have a clear idea of what may be the prospects for improvement in procurement management, project validation and control of interference, as well as the work progresses. The training program is focused on issues related to the tools for integrated BIM design. Architectural design, engineering, energy, structural, management of the sites and building management are supported by software tools compatible with each other, in logical BIM.	Employment opportunities are expected from construction companies, manufacturers of building technology, engineering and architectural design firms, public administration.	Engineers , Architectes and candidate in related scientific disciplines	Harpaceas Autodesk
	Italy	Italian	+39023994381	Building information modeling negli uffici tecnici: la modellazione e la gestione dei progetti		training program is focused on training and retraining of operators in the technical offices employed in public works. Starting with what is stipulated by the European Parliament on procurement (European Union Public Procurement Directive, EUPPD) that, from 2016, defines the obligation of the use of BIM software, in the design activities for the public works funded by the Union European, it does a excursus on the law, the processing of data, responsibilities, and will continue with a basic training on the use of some applications. Some theoretical basis and practical applications, will enable the user, you can open and manage files and projects drawn up in the field of integrated design BIM. They'll discuss some of wide use software and functionality as well as the areas of application.	4 mois	1.100 €	Online	Master professionnel	graduated wishing to specialize, and professionals or public and private employees who need professional updates that recognize CFU. The courses and educational activities, allow you to have both theoretical foundations and practical examples.	The basic training, will allow to have a clear idea of what may be the prospects for improvement in procurement management, project validation and control of interference, as well as the work progresses. Particular importance is given to project work and homework on case studies.		The course has as a training and professional development opportunities for executives, technicians, professionals, officials who work or incorporated in technical departments of public and private institutions, real estate developers and construction firms or offices.	
Sapienza Università di Roma.	Italy	Italian	(+39) 06 49919172	MASTER BIM - FACOLTÀ DI ARCHITETTURA SAPIENZA UNIVERSITÀ DI ROMA		The Master, in the training activities of the BIM Academic Forum Italy, meets the growing demand for training new professionals dedicated to the Integrated Management of the buildings related to the life cycle information, coming from public and private Clients, Designers, Developers and Managers. The training is set with a multidisciplinary approach and conducted by university lecturers and external experts in two main directions of BIM BIM Education and Training.		4.000 €		Master					Astaldi spa Associazione I Think BIM Rivista "FMI Facility Management Italia"; Ingenio – sistema integrato di informazione per l'ingegnere

Name of the organisation	Country	Language	Contact Information	Name of the training	Bim Level	Training Description	Duration	Price	Online / On site	- Certification - No Certification - EQF Lvl	Requirement	What will you learn ?	Opens to	Target	Partnership
University College Cork   College of Science, Engineering and Food Science	Ireland	English	+353 (0)21 420 5400	MEngSc Engineering Information Technology in Architecture, Engineering and Construction		The course addresses the increasing need for engineers and architects with advanced knowledge and skills in the application of information and communication technologies to support sustainable design and operation of buildings and energy systems, facilities management, virtual construction, building information modelling (BIM) and structural engineering.	1 year full time, 2 years part time	€7,000 Full time, €4,000 Part time	On site Online	MEngSc	Candidates must have a BE (Hons) or BEng (Hons) or a Second Class Honours degree in Computer Science. See also detailed entry requirements	the acquisition of new knowledge and practical skills in selected engineering disciplines - the acquisition of knowledge and skills in selected areas of computer science - the application of the newly-acquired knowledge in two projects - the development and submission of a minor research thesis. In the first teaching period students acquire knowledge of: - Smart Buildings, Facilities and Energy Management - Software Engineering - Knowledge Management or Computer Mediated Communication. In the first teaching period students acquire knowledge of: - Building Information Modelling (BIM), Data Warehousing, and E-business - Virtual Construction, Automation in Construction or Finite Element Analysis (electives)	On completion of the course, extremely attractive to employers who need engineering with a strong IT-background, working in the following areas: - civil and energy-engineering consultancy - facilities management - energy service provision (ESCO) - construction management - building operations - software engineering - project management.	professionals as well as young graduates from all computer science and engineering disciplines who want to improve their knowledge of customising information and communication technologies	
Dublin Institute of Technology	Ireland	English	01-402 4014	Applied Building Information Modelling and Management		This programme is open to building and infrastructure design- and construction-related professionals who have academic or practice-based knowledge of BIM Technologies and Collaboration. The programme recruits from the disciplines of architecture (including technology), engineering, surveying (Quantity and Geomatics), construction management, and facilities management. The programme educates those who initiate, manage, and lead collaborative, multidisciplinary construction and full lifecycle design, build, operate and maintain projects through the medium of BIM.	2.5-3 years	€ 6.900,00	On site	MSc in Applied Building Information Modelling and Management	Postgraduate Diploma in Collaborative BIM or equivalent via DIT's RPL policy.	* deep understanding of BIM's underpinning theoretical principles * the ability to source, quality-assure and distil information from the principal sources of BIM-related knowledge, research and methods for dissemination to team members and key stakeholders * innovation capability in the development and application of fit-for-purpose solutions to ill-defined and complex problems * provision of reasoned advice and consultancy in both a local and national context to BIM clients and other interested parties * evaluation of the performance of BIM projects and assessment of their compliance with specifications and standards * undertaking applied research aimed at solving outstanding BIM-related problems * eligibility to apply for membership of appropriate professional bodies	This programme aims to produce graduate who are ready to enter the market in BIM Leadership and Senior Management positions such as BIM Lead, BIM Programme Manager, or BIM Operations Manager having spent short periods in Junior management roles such as BIM Information Manager, BIM Co-ordinator, or BIM Manager.	This programme is open to building and infrastructure design- and construction-related professionals who have academic or practice-based knowledge of BIM Technologies and Collaboration.	
	Ireland	English	01-4024014	Postgraduate Diploma in Collaborative BIM		This programme is aimed at professionals with knowledge of particular BIM Technologies but without experience of the collaborative environment that makes BIM the powerful process mandated in the UK, Germany and other countries. A deep, working knowledge of these processes is required by all Irish companies engaging in international activities and this programme provides the safe, multidisciplinary context in which this experience can be gained.	2 years	5.100 €	On site	Postgraduate Diploma in Collaborative BIM	Postgraduate Certificate in BIM Technologies or equivalent through DIT's RPL policy	Evaluate how BIM is used as a whole building process, concept design to dismantle Apply key standards and protocols for BIM design and construction projects Create BIM data and data deliverables to current publicly-accessible standards Develop BIM Implementation strategies including EIR (employer information requirement) and BEP (BIM execution plan) Evaluate how data is layered within a digital model for asset / facilities management both from design-BIM and as-built BIM Assess the implications of BIM in a legal context in relation to contracts / risk / collaborative agreements Appraise BIM integration with IBIM/CIM and GIS / CityModelling for infrastructure, local, regional and national planning Evaluate the Contractor's perspective on using BIM Evaluate the potential of Dynamic Simulation tools in a BIM environment Effectively utilise collaborative communication tools. Contribute effectively to the maintenance of a pre-designed workflow programme. Appraise and communicate the interim and final outcomes of a multidisciplinary collaborative project for professional and non-professional audiences. Appraise a standards-based, collaborative BIM framework and process. Critique the use of BIM as a building/construction and business process relative to the use of only the computer-based technological aspects of BIM Recommend improvements to all processes.	provide graduates of building design and construction-related programmes with an educational setting in which to develop an ability to collaborate in the design, construction, and management of buildings and infrastructure through the use of BIM processes and associated Lean construction techniques.	This programme is aimed at professionals with knowledge of particular BIM Technologies but without experience of the collaborative environment that makes BIM the powerful process mandated in the UK, Germany and other countries.	

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House of training	Luxembourg	Français	+352 46 50 16 – 1	<b>BIM Management : théorie, protocole et pratiques</b>		Le développement de la maquette numérique dans le secteur de l'architecture et de la construction fait émerger de nouvelles missions et un nouveau métier pour gérer les maquettes numériques disciplinaires et les problèmes d'interopérabilité entre les différentes producteurs d'information.	1 jour	150 €	On site		Formation qualifiante	Comprendre les problématiques de gestion de maquettes numériques dans un projet de conception et identifier les jeux d'acteurs au travers d'exemples et de cas d'étude, Connaître les fonctionnalités des outils d'intégration de maquettes numériques disciplinaires et de détection de problèmes, D'initier la mise en place d'une méthode de contrôle de maquettes et de suivi de la résolution des problèmes		Architectes Ingénieurs Entreprises de construction (bureaux d'études) Maîtres d'ouvrage	LIST
	Luxembourg	Français	+352 46 50 16 – 1	<b>OPEN BIM : une approche collaborative entre architectes et ingénieurs</b>		SCIA présente l'échange de projets entre architectes et ingénieurs dans un environnement Open BIM avec les logiciels de dessin Allplan et calcul de structures SCIA Engineer.  En partant d'un modèle d'architecture, ce cas d'étude montre comment sont dérivés de manière transparente le modèle de structure (dessin) et le modèle d'analyse (calcul). Ce processus est basé sur l'emploi de modèles de référence avec un lien certifié IFC.  Le modèle d'analyse (SCIA Engineer) sert de base pour le calcul (efforts internes et ferraillages). Les modifications structurelles et les ferraillages sont repris et élaborés en détail d'exécution dans Allplan, où les métrés et les plans de construction sont générés.  L'approche Open BIM assure ainsi toujours une parfaite cohérence des informations entre tous les partenaires du projet.	1 jour	150 €	On site		Formation qualifiante	comprendre l'approche Open BIM* en phase de conception, réalisation et exploitation connaître le potentiel de l'approche BIM et son niveau état de l'art connaître des cas pratiques		Architectes Ingénieurs Entreprises de construction (bureaux d'études)	LIST
	Luxembourg	Français	+352 46 50 16 – 1	<b>SketchUp, utilisation avancée et workflow BIM</b>		La formation Sketch-Up "avancée" se déroule sur deux journées. Le premier jour, les participants découvriront les plug-ins essentiels pour la modélisation avancée, notamment pour créer des formes géométriques complexes, ainsi que des outils de rendu. La deuxième journée s'attachera à montrer comment Sketch-Up s'utilise de manière efficace dans un cycle de production : de la présentation professionnelle de l'avant-projet à ses usages multiples dans un flux de données basé sur des modèles BIM (usages Sketch-Up parallèles et contrôle des modèles, modélisation 4D...).	1 jour	770 €	On site		Formation qualifiante	savoir créer des modèles 3D avancés avec SketchUp présenter et mettre en page le projet avec LayOut connaître les plugins incontournables de SketchUp utiliser SketchUp dans le workflow de production global du projet		maîtres d'ouvrage, architectes, ingénieurs, designers, architectes d'intérieur, entreprises de construction etc.	LIST

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Norwegian University of Science and Technology	Norway	Norwegian	+47 73595000	BIM – Intelligent Modelling		Digital building information can more easily be coordinated and utilized in the phases of construction by using BIM. Data models follows the project from cradle to grave. Collaborators communicate through data models, this gives better quality, less errors and streamline the construction processes and management, operation and maintenance	Part time and distance over 2 years		On site Online	Master		The focus of the study is not aimed primarily at using software, and it puts a lot of emphasis on good overall understanding and how BIM can be utilized in various contexts. in the use of open, international standards, as well as coordination and optimization of all associated processes.	Increasingly imposes larger builders practitioners in the industry to use BIM in some or all parts of the construction process, and this requires many practitioners obtains good BIM expertise. It also requires that the builder can assure quality and adopt the deliveries they even book the best possible way . job opportunities both public and private .	Students engineers and architects	





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Universitat Internacional de Catalunya, Barcelona	Spain	English	+34 93 254 18 00	International Master's Degree in BIM Processes		Building Information Modelling (BIM) is a technological process that has been developed as an innovative, cutting-edge alternative for work systems in the construction industry. It is becoming increasingly more essential to the industry as an international working language with an approach based on process integration that opens up opportunities for new work environments and business activities.	11 months	13.980 €	On site	International master degree	official Spanish university degree, or a degree awarded by a foreign university recognised by the European Higher Education Area, and that can be used in the country in which it was bestowed as a form of access to postgraduate courses. Official Masters courses are open to those who hold university degrees in any field, and who meet basic admission requirements. However, admission will ultimately depend on the criteria established within each Masters programme.	You will gain further knowledge of BIM design tools and software. You will learn about the tools and software used to monitor, analyse and manage buildings. You will find out how data is exchanged between the various areas and stages of construction. You will broaden your knowledge of BIM software interoperability. You will take an in-depth look at the regulatory context and international standards. You will gain real-world work experience in BIM implementation projects. You will gain insight into the job prospects and new business models relating to BIM.	The Master's Degree in International BIM Processes is right for you if you have a link to the construction industry (architects, engineers, construction supervisors, installers, builders, developers, etc.) and are looking for training to further your professional career. It is a good opportunity if you are interested in new job or business opportunities.	In addition to meeting the legal requirements described in the access routes, the Office of Admissions will highly value:  Applications that show sufficient prior training Descriptions of relevant work experience Priority will be given to candidates who have completed studies in engineering (preferably industrial engineering) or business management.	
	Spain	English	+34 93 254 18 00	Postgraduate Degree in BIM Operations		This postgraduate programme will help you understand how to approach building information modelling (BIM) processes and technology in your projects. You'll understand the benefits of these processes and the challenges involved in using them. After analysing and understanding the history of BIM, you'll be introduced to the key processes and technologies used in each project phase. This learning experience begins with the development of design solutions and ends with an understanding of data exchange between disciplines.	4 months	4.500 €	On site	Postgraduate Programme in BIM- Ready from the UIC Barcelona School of Architecture.		Theory and History of BIM Rules and Standards Information on the Project Life Cycle Data Management BIM Content BIM Design Software	getting started in the world of BIM to understand everything about how it works.	Students engineers and architects	
	Spain	English	+34 93 254 18 00	Postgraduate Degree in BIM Management		This postgraduate degree will help further your knowledge of Building Information Modelling (BIM). You will learn how to apply the basic concepts with regards to management and organisation.	7 months	9.800 €	On site	Postgraduate Degree in BIM Management from the School of Architecture at UIC Barcelona.		Multidisciplinary information management - Design coordination - Construction - Planning - Sustainability Performance simulation and analysis Draw up protocols and guidelines for all stages of BIM projects. Develop implementation plans for offices.	onsolidate the knowledge of BIM processes and learn how to implement them in projects.		

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bec partners SA	Swisse	Français	0848 160 160	BIM Management						Formation qualifiante		Contexte environnemental Modèles générique urbain Modèles génériques architecture et construction Modélisation CVSE Modélisation Structures Modélisation systèmes constructifs coordonnés Management projet , réseaux et données	BIM managers		
SIA	Swisse	Français	044 283 15 58	processus global du bim		Le BIM est un processus global d'élaboration de tout projet immobilier, c'est un processus qui s'étend sur tout le cycle de vie du bâtiment. Ce cours permettra d'avoir une vision plus précise sur les cinq différentes phases qui constituent ce processus BIM. Nous développerons et expliquerons plus particulièrement l'implémentation du BIM au cour des phases de conception, de construction et d'exploitation du bâtiment.	1 jours	700 CHF	On site	No certification	No requirements	une vision plus précise sur les cinq différentes phases qui constituent ce processus BIM Les sujets seront présentés en se basant sur la présentation de cas de projets réels. Le BIM (Définition, Lexique, Etat d'avancement) Le Roles dans le processus BIM Le Maître d'ouvrage – Le client Conception (Intégration et Exploitation des données) Coordination du processus BIM L'entreprise (Création et récupération du model) L'exploitation des données		architectes et bureaux d'études d'ingénieries (de conception et d'exécution) cependant plusieurs sujets traités concernent directement les maitres d'ouvrages.	
Mensch und Maschine	Swisse	German	80068610000	BIM manager		The aim of the compact , consisting of two blocks BIM Manager seminar is to establish a basis for the fundamental , common understanding of BIM technologies , communications , project requirements and responsibilities and to establish the basic principles for a successful BIM implementation. You get a wide BIM - based knowledge of leading international initiatives , important technologies , standards and procedures for open and collaborative BIM .	5 days		On site	Formation qualifiante		Overview of BIM structures Strategies for introducing BIM in companies Concepts and methodological bases of BIM National and international BIM standards and developments	Following the training as BIM Manager, you can : BIM introduce in your company . effectively manage processes associated with BIM . assess and evaluate the changes in the contract structures and Honor statements by BIM .	managing , BIM coordinators and project managers .	
	Swisse	German	80068610000	BIM constructor/designer		The practical training for BIM designer teaches basic concepts , benefits and procedures of the Building Information Modeling ( BIM ) . You will learn how to plan projects using a virtual building model in the future much more productive . You learn the BIM - based method of Autodesk Revit tick and get informed insights into optimized planning processes and BIM guidelines . Training for BIM constructor consists of the modules bases , structure , families and BIM design .	10 days		On site	Formation qualifiante		Information on the impact of BIM in practice large construction projects Applying Autodesk Revit modeling rules Insight into the BIM structures Exchange format IFC Overview of software solutions for further use of the BIM model	It opens to: Optimize the communication and exchange with other trades Learn simple test methods for the BIM model . quality assurance . How you can interact with other BIM partners .	planners, draughtsmen and BIM beginners	
	Swisse	German	80068610000	BIM coordinator		To exchange information between different designers with different software environment , a clearly defined data exchange is the basic requirement . It is this process definition allows a sensible use of BIM . In this seminar you will learn how to use IFC - data and quality assurance on the basis of this data format .	5 days		On site	Formation qualifiante		Deepen exchange format IFC Additional exchange formats ( as BCF ) Use of Solibri ModelChecker Applying Autodesk Navisworks with collision check , TimeLiner and cost control	Tools to help save time , money. Improve planning quality .	BIM engineers , technical project manager and senior staff .	



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Middlesex University	United Kingdom	English	+44 (0) 20 8411 5555	Master Building Information Modelling Management		The construction sector is a major part of the UK economy. It represents some 7% of GDP or £11bn per annum of expenditure - 40% of this being in the public sector, with central Government the industry's biggest consumer. Now any centrally procured project will require Building Information Modelling (BIM) compliance.  BIM is a process involving the structured sharing and coordination of digital and non-digital information about a building project throughout its entire lifecycle, from design through procurement and construction and beyond, into the operation and management stage, all the way through to demolition. It involves the efficient coordination of processes, workflows, people, documentation, graphic/non-graphic assets and technology.	12 months	12,250	Online	Diplôme Universitaire	Degree qualification (minimum 2nd class) in an appropriate construction discipline (e.g. architecture, architectural technology, civil, mechanical, electrical engineering, surveying etc.) and 3 years relevant industrial experience. Or A corporate member of a relevant professional body including 3 years of relevant industrial experience. Or Relevant industrial experience on a case-by-case basis	Operational BIM Management Technical BIM Management Strategic BIM Management	a qualification to be employed in a Management role in BIM projects. These include technical BIM management positions, operational/administrative BIM management positions, and strategic BIM management positions.	architects, architectural technologists, construction and civil engineers, mechanical, electrical and plumbing services (MEP) engineers, heating, ventilation and air-conditioning (HVAC) engineers, technicians, contractors, subcontractors, fabricators and manufacturers, project managers, facilities and operations managers (FM & OM), quantity surveyors, cost and legal consultants.	
Birmingham City University	United Kingdom	English	+44 0 1213315389	Building Information Modelling (BIM) and Management - MSc		The construction industries around the world are moving into a new digital era to address the performance needs of clients. As a result, the use of Building Information Modelling (BIM) is increasing in the construction industry and seemingly has the capacity to impact every aspect of the built environment.  This course aims to provide you with the capability to integrate construction project delivery processes through collaborative practices and Building Information Modelling (BIM) to promote an effective, efficient, socially responsive and sustainable construction industry.	13 months 24 months	£7,500 £3,750 per year	On site	Diplôme Universitaire	A good UK honours degree at 2.2 or above / equivalent. Students who have relevant professional experience may be invited to an interview and/or to take a test, at which they will be required to demonstrate the necessary knowledge and understanding for entry onto the course.	Develop the capability to integrate construction project delivery processes through Building Information Modelling (BIM) and collaborative practices to promote an effective, efficient, socially responsive and sustainable construction industry. Develop into a construction professional for the new digital age by providing capacity required to lead and assist digital developments of the industry.	As a postgraduate, you'll have advanced skills and knowledge. You'll have the ability to identify problems within the management of design and construction projects and suggest innovative solutions. You'll also have a sound knowledge of legal implications, sustainability, economic impact and effects of social change in relation to the built environment.	Students	
University of Salford Manchester	United Kingdom	English	+44 0 161 295 5000	BIM and Integrated Design		If you are interested in the fundamental changes occurring across the construction industry, and efficient multidisciplinary collaboration in the design and construction process with the support of advanced BIM technologies, this is the course for you. It provides the skills and competences to support integrated design and delivery solutions and the coordination of roles and responsibilities for the financial, environmental and social performance of built environment assets. The course builds upon leading edge research and practice, enabling students to up-skill to undertake a leading role in the transformation of practices in work settings.	Check site	Check site	On site/Online	Diplôme Universitaire	Applications will typically be accepted from candidates who have:  a minimum second class undergraduate honours degree in architecture a minimum second class undergraduate honours degree in engineering, project management or other built environment discipline, or a recognised professional qualification in a cognate discipline.	Gain knowledge of advanced BIM technologies and lean processes Develop skills to deliver better value through integrated design and project delivery Research-based teaching, including industrial guest lectures	This course will enable architects, designers and design/project/construction/facility managers to specialise in the use of BIM and the implementation of integrated design and delivery.	Architecture Architectural technology Structural and mechanical and electrical engineering design Design Design/project/construction management Facilities management	
University of the West of England	United Kingdom	English	+44 (0)117 9656261	Building Information Modelling (BIM) in Design Construction and Operations		Building Information Modelling (BIM) in Design, Construction and Operations is fast becoming the industry standard approach to designing, analysing, and managing building lifecycle. On this course you will learn a holistic approach to everything from design and construction to maintenance, operation, and sustainability from industry and research experts using state-of-the-art BIM software. You will also benefit from regular talks from BIM experts and close links to the industry and BIM Regional Hub: South West.	One year full-time, Two to three years part-time	Check site	On site	Diplôme Universitaire	An honours degree of 2.2 or above in a built environment subject, or if in a different subject, with built environment experience.	BIM in Design Co-ordination BIM in Construction Operation BIM in Business and Practice BIM in Operation and Maintenance Low/Zero-Impact Buildings Construction Project Management Practice Construction Contract Law Dissertation	This course is designed to create the next generation of BIM leaders ready to work with technical professionals on project teams. It's highly relevant to architects, project managers, and construction professionals. Professionals with BIM expertise and knowledge are increasingly sought after in industry, academia, training and consultancy, and this course can lead to a variety of career options, including BIM Designers, BIM Managers and Digital Engineers.	Students	
Northumbria University	United Kingdom	English	00 44 191 227 4274 0191 227 4453	Building Design Management and Building Information Modelling (BIM) MSc		Following the rise of importance in the use of Building Information Modelling (BIM) within the Built Environment professions Northumbria University established the BIM Academy with Ryder Architecture – one of the leading Architecture firms in the country. BIM will transform the Built Environment. By sharing information between Design Team (architects, surveyors, consulting engineers), Contractors and Subcontractors, and Owners, it can add additional discipline-specific knowledge to one single model, meaning significant reduction in information loss, and a more efficient, accurate construction process and improved maintenance and repair of buildings. This programme is unique in that it is responding directly to industry demand to provide students with enhanced knowledge of BIM software and its strategic integration into everyday projects.	Check site	Check site	Online	Diplôme Universitaire	Degree (2.2 or above) in a relevant subject.	To provide a better understanding of the future of construction and how the industry will develop in a BIM-enabled future To provide an understanding of the complexity of working in interdisciplinary teams and managing collaborative design and production To allow students to develop new skills which will enhance their ability to plan and execute design for construction, producing more efficient, sustainable and buildable projects To allow construction industry professionals to enhance their existing skills in order to improve project delivery through the use of Building Information Modelling and Management. To foster leadership, decision making, strategic thinking and communication	This programme is unique in that it is responding directly to industry demand to provide students with enhanced knowledge of BIM software and its strategic integration into everyday projects.	Construction professionals Students coming from a design or construction background	
University of Liverpool	United Kingdom	English	+44 (0)151 794 2622	Building Information Modelling (BIM) MSc		In today's tough economic climate the construction industry faces ever more challenges to become more efficient and integrated. At the forefront of the response to such challenges is the increasing use of Building Information Modelling (BIM). Building Information Modelling is a comprehensive, integrated and efficient approach to design and construction that builds on both architectural knowledge and technological progress. By the drafting, analysis and use of intelligent models, BIM drives the production of more accurate and effective building plans.	12 months 24 months	£5,500	On site	Diplôme Universitaire	Check site <a href="https://www.liverpool.ac.uk/study/postgraduate/taught/bim-msc/entry-requirements/">https://www.liverpool.ac.uk/study/postgraduate/taught/bim-msc/entry-requirements/</a>	Theory of BIM and Integrated Project Delivery Critiques and Communications in Architecture and the Visual Arts Managing Collaborative Workflows for BIM nD Modelling and Interoperability in BIM environment BIM-Enabled Sustainable Design	Students who successfully complete a Higher Degree go on to interesting and rewarding careers in architecture, the wider construction industry, management, higher education, the arts and conservation and many other specialisms to be found in the arts, architecture and the built environment	students or practitioners from architecture, engineering or construction professions	
The University of Wolverhampton	United Kingdom	English	01902 32 22 22	Postgraduate Certificate Building Information Modelling		The 2011 Government Construction Strategy has stated that Building Information Modelling (BIM) has to be adopted and utilised on all public projects by 2016. The aim of this course is to develop students with high-level knowledge and understanding of BIM. This new approach is strategically important for the UK and International Construction Industry and throughout the course students will not only develop a comprehension of how the tools operate, but also how these can be implemented within the business context of the Architecture and Construction sectors.	Full-time (6 months) Part-Time (1 year)	£1,967 1,915	On site	Diplôme Universitaire	Check site	Demonstrate a systematic understanding and critical awareness of current and emerging CAD technologies in relation to the construction industry  Select and effectively implement an appropriate range of advanced software tools in order to produce architectural design and construction documentation including drawings, visualisations and presentations  Demonstrate high level skills and abilities to make use of generic and bespoke software tools, solving complex design problems and developing appropriate solutions for presentation to a range of audiences  Evaluate current research and scholarship within the general area of ICT for construction, critique current research methodologies and apply this knowledge to solve original problems	Potential employment opportunities for graduates include: architectural and interior design practices; civil engineering practices; local authorities; environmental management agencies; space-planning and office furniture companies; and design consultancies.	Students	
University of Westminster	United Kingdom	English	+ 44 (0) 20 7911 5000	Building Information Management MSc		The unique nature of Westminster's Building Information Management MSc is the focus on 'Management', which will create professionals who are able to manage the whole construction process and the information associated with this. The course is accredited by the Royal Institution of Chartered Surveyors (RICS) and the Chartered Institute of Building (CIOB).	One year full-time; two years part-time			Diplôme Universitaire				The Building Information Management MSc is mainly aimed at graduates who are already in construction-related employment and who aspire to senior positions in their field	
	United Kingdom	English	+ 44 (0) 20 7911 5001	BIM AND DIGITAL CONSTRUCTION – FREE ONLINE COURSE		What does Digital Construction and BIM mean to you? Do you want to know what impact BIM (Building Information Modelling) is having on the construction industry and how digital technology will affect the way you work?  The digital revolution is starting to impact the construction industry and there are already organisations that are benefitting from embracing what BIM has to offer.	4 weeks	Free	Online	No formal academic credit	None, but some basic familiarity with construction industry practices will be helpful. You should be enthusiastic about construction and have a desire to improve the industry.	Explain what digital construction is Describe the benefits, enablers and drivers of a digital working environment Identify situations in which digital construction could improve current practice Identify challenges to adopting digital practices in construction Recognise how you can equip yourself to participate in digital construction	All	The B1M.	
University of Reading	United Kingdom	English	+44 (0) 118 378 8201	Information Management for Design, Construction and Operation		The distinctive focus is on the implementation and use of digital technologies in the construction sector. The programme combines internationally-renowned academic and industry expertise with intensive practical learning using state of the art technologies within the university's dedicated BIM laboratories and virtual reality facilities.	Full-time one year, or two year/flexible part-time	Check site	On site	Diplôme Universitaire	Applicants are normally required to have a good undergraduate honours degree in any subject. Candidates with a lesser degree and relevant professional qualifications (e.g. MRICS, MCIOB, MICE) will also be considered.	Collaboration, practice and innovation Information Systems in Construction Building Information Modelling Advanced Visualisation and Interactive Tech. New Technology, Management and Change Analysing Construction Processes	The programme provides an opportunity to develop expertise in the developing field of information management for built environment and infrastructure.	Project managers concerned with project information management; Construction professionals responsible for the implementation of new technologies in projects and/or construction enterprises; Business leaders with an interest in digitally-enabled construction; Client representatives seeking to maximise the quality and value of asset information.	
BRE Academy	United Kingdom	English	+44 (0) 333 321 88 11	BIM level 2 Fundamentals	Level 2	This course provides foundation training on BIM processes, procedures, information models, management and collaboration. We will support you to achieve an understanding of the Government's approach to BIM, how the benefits of BIM can enable step change and can be realised in your organisation.	2 days	£785	On site	Formation qualifiante	Global and Industry Challenges which BIM addresses UK Government Construction Strategy and 'BIM' Level 2 requirements National and Industry Standards related to BIM The role of Project and Asset Information Models Information Management Roles in the standard (PAS1192-2:2013) Managing Project Information – creating processes and procedures The Information Delivery Cycle and how it works in practice (PAS1192-2:2013) The Collaborative Production of Information - creating processes and procedures Overview of the Common Data Environment (BS1192:2007) The commercial impact for your contracts and insurance	Help save you and your company money and time in the design, construction and operation of buildings and infrastructure. Foundation training on BIM processes, procedures, information models, management and collaboration.	Design, construction and project management professionals seeking a solid and practical foundation in BIM from the leaders in BIM standards and BIM Information Management - BRE, BuildingSMART and Avanti Partnership.		
BRE Academy	United Kingdom	English	+44 (0) 333 321 88 11	BIM Level 2 BS1192/2 Project Information Manager (PIM) & Task Information Management (TIM) training	Level 2	The Project Information Management (PIM) and Task Information Management (TIM) roles are aimed at the delivery of the content of information against the Employers Information Requirement (EIR), using standards, methods and procedures that have been agreed across the design and construction teams.	2 days	£700	On site	Formation qualifiante	This course is available to anyone who has successfully completed the first stage BIM Fundamentals course.	What are the benefits of BIM? What are the blockers to collaborative working? An overview of BS1192:2007 Common Data Environment Standards, Methods and Procedures CDE demonstration What is the clash avoidance process? Digital Plan of Work Who owns the data? What is the Volume Strategy? Employers Information Requirements Data development, collection and delivery Project Information Management Process Project Information Management Task/work sheets	This course is available to anyone who has successfully completed the first stage BIM Fundamentals course.		

## BIM4VET Partners

LIST / Luxembourg Institute of Science and Technology	 
Cardiff University	
LIST / CEA tech / Commissariat à l'Energie atomique et aux énergies alternatives	

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