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D 6.5 - Package of complete materials for delivery of sample qualifications

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D 6.5 – Package of complete materials for delivery of sample qualifications

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Colophon

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Revision and history chart

Version	Date	Editors	Comment Description



List of acronyms and abbreviations

BIM – Building Information Modelling

BIM-EPA – BIM Energy Performance Alliance

BEM – Building Energy Modelling

CPD – Continuous Professional Development

EE – Energy Efficiency

GSL – Guided Self Learning

ICT – Information and Communication Technologies

NZEB – Nearly Zero Energy Building

PBL – Project-Based Learning

WP-Work Package

D – Deliverable

T-Task

MS- Milestone

WIP-work in Progress

BMC- Belfast Metropolitan College

IST-Instituto Superior Técnico

LO- Learning Outcomes

OA- Ordem dos Arquitectos

ULO- Unit of Learning Outcome



Publishable executive summary

This report gives an overview summary of the package of completed materials for delivering sample qualifications. The final set of materials were selected to stimulate demand for digital tools supporting energy efficiency. It was intended to provide a sample for market implementation on how to support efficient pathways for professionals to upskill in sustainability and digital construction. These materials are connected to objectives of WP6: Build the capacity of the market drivers and actors, on both demand and supply side, to appreciate the benefits of the developed digitalisation skills and certification program, and to apply them in mutual collaboration.

They have been developed in collaboration with WP3, WP4 and WP5, following the trials and pilots, including implementation of feedback from participants. They constitute the last iterations, following a robust trial period reported in previous WP6 reports (D.6.3 and D6.4), with this report summarising the outcomes.



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1. Introduction

This deliverable reports on the Package of complete materials for delivery of sample qualifications. The materials were created and integrated within the resources and capacities of the ARISE Digital Platform - [Arise Training \(ariseplatform.eu\)](https://ariseplatform.eu), developed by WP4. The materials were developed together and in symbiosis with WP5, for delivery on the platform and moderated by WP6. This report serves as a companion to WP5 D.5.4 Report, due to the close link of WP5 and WP6 regarding to this Deliverable.

The materials are based/aligned with the ARISE Qualification Framework and are suitable to enable mapping and application towards future deployment into CPD (Continuing Professional Development) schemes.

Development background

This deliverable follows on from Tasks T6.4 and T6.5, which focused on the development, quality control, and deployment of those digital training tools and piloting upskilling schemes. These tasks set the preliminary testing groundwork towards this last iteration.

Task 6.4 concentrated on the pre-production for market readiness of the materials for digital tools. This involved a close collaboration with WPs 4 and 5 to integrate outputs, create an initial set of training tools, and assessment materials for the ARISE pilots. Materials went through several iterations, corrections, and amendments, based on internal testing, and feedback and comments from early trial testers.

Task 6.5 related to the actual deployment and testing of these digital tools. To demonstrate their environmental, economic, and energy benefits. This phase involved improvements to the platform, based on further internal testing and feedback from trial participants. Other Improvements included minor realignment of training methods, enhancement of the training materials, and further



improvements in the platform's tools. The aim was to facilitate the delivery and management of the trials, prepare for deployment of the final package and exploitation.

WP6 moderated the ARISE development and demonstration of upskilling materials (WP5), with pilot testing open to all European regions including Consortium partner specific supported targeting. WP8 supported WP6 with dissemination and publicity of the Trials across all European regions. ARISE engaged with a range of participants in direct market stimulus to increase demand for upskilling in sustainable energy skills. The trials were facilitated organically through the ARISE platform, with additional assistance from webinars, blended tutorials, and social networks. Further support in the form of international and regional events aimed to help engage the audience with training. The ARISE Trials pilot case studies demonstrated the multi-criteria benefits of the application of new digitalisation skills towards energy efficiency, as well as the proposed qualifications scheme for recognised competencies of the ARISE proposed Framework.

The uptake during trials (please refer to 6.4 report) following initial slow participation eventual built to higher numbers engaged in direct training and upskilling, as well as

Prior to the commencement of trials many users had already been contacted and engaged with ARISE via the newsletter, website, social media, and other more generic upskilling events. Refer to WP8 dissemination and reporting figures for more information and details. However, upon launch of trials there was slow uptake and engagement in direct training, despite strong dissemination and awareness raising activity. Following the project extension, the project achieved more than 3000 users participating in the trials, with more than 300 achieving completion of training modules. The findings of the feedback are detailed in D6.4 report. WP6 acted on those findings to assist the development of these complete materials.



Current iteration

The current package of complete materials is directly linked to Task 6.7, which focused on the further development, improvement, or creation of new materials following sample trails. This package of materials was developed and deployed with phased releases. It supports learners with bite-sized and stepped learning.

This report acknowledges these collaborative efforts between partners and WPs, moderated by WP6, that aimed to ensure that these digital tools were effectively developed, tested, and primed for market wide implementation. That testing guided Task 6.7 towards the final set of materials.

The materials cover several groups of the ARISE QF, including BIM Support and BIM Applications, in specialisms such as BIM Basics, BIM Modelling, and BIM coordination. They have been developed to allow bite-sized deployment to stimulate uptake and progression, with possible mapping towards a CPD based system.

2. Objectives and Scope

Regarding the scope and context of this deliverable, it follows on from what was previously reported in D6.3 and D6.4. The work carried out and reported is linked to *Task 6.7-Development of final package with selection of revised materials, ready for market delivery*, and associated with findings of *T6.6- Report on the testing package of digital training tools and pilot upskilling schemes delivery*. This in turn is linked to the outputs of *T6.5-Deployment of Trials /test and delivery of a digital training tools and pilot upskilling schemes package* and *T6.4-Development, Quality Control, and of sample digital training tools and pilot upskilling schemes package*.

These materials aim to contribute mainly towards the second Objective of WP6: Build the capacity of the market drivers and actors, on both demand and supply side, to appreciate the benefits of the developed digitalisation skills and certification program, and to apply them in mutual collaboration. They will also

indirectly keep contributing towards the objective of the validation of the proposed Qualification Framework in the wider context as professionals use them to increase their skills. Furthermore, they will contribute towards the intended impacts of ARISE.

3. Package components

3.1 Initial Thought and Approach to delivery of the Framework into a set of materials

As validated by positive responses in the trials feedback (refer to report D6.2 and consequent appendix in report D6.4), the task-based approach of the Framework continued to be the main guide and focus for the work carried out in conjunction by WP5 and WP6, leading up to this final set of materials.

The Framework defined the 4 main Group Areas of Competencies with the associated Specialism. For each Specialism the required tasks and subtasks, competencies and knowledge contained in the ULOs, associated with the sub-tasks are clearly defined.

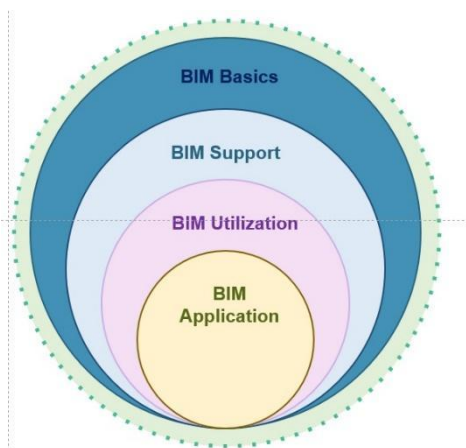


Fig 01. Diagram of the 4 Framework Grouping

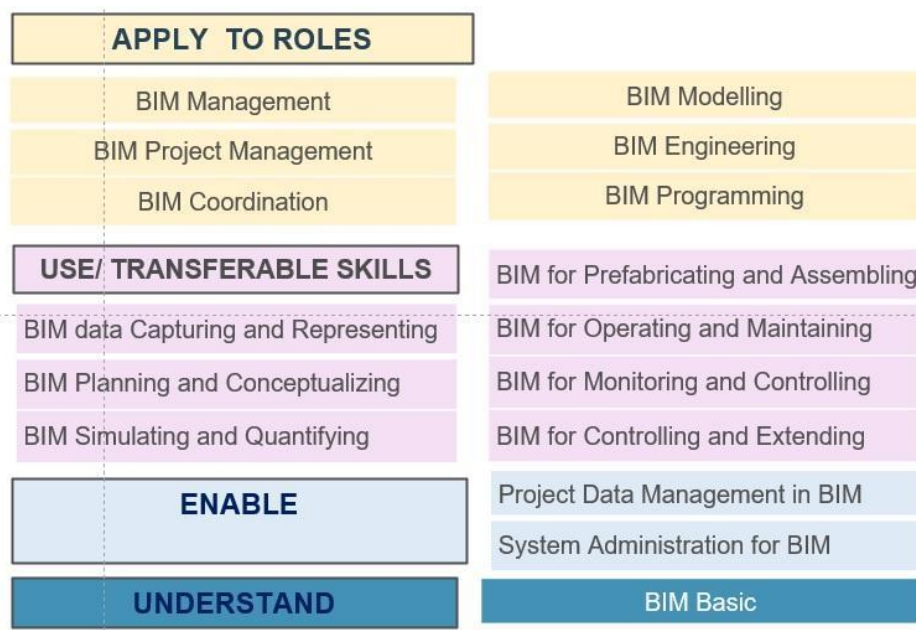


Fig 02. Diagram of Grouping Specialisms

From project inception the proposal approach for the Framework delivery materials was to have the sub-tasks at the indicative level for the training delivery micro-modules.

As we progressed into production for trial testing and iteration improvements for a final package, together with WP5 we focused on developing the approach and method for breaking down the Framework into the concept of the interchangeable micro-modules. Such modules were bite size, and could be common to different tasks, or Specialism pathways, enabling flexibility and transferability of shared knowledge or skills. However, we found that the original approach matching micro-modules to sub-tasks was limiting and required an adaptation from our initial intent.

Pre-production and further production continued to subdivide the Framework to align sub-tasks and their ULOs to correspond to micro modules enabling interchangeability through that Framework. As it became apparent that some sub-tasks shared and required a common base knowledge, to support and shorter



delivery period and interchangeability, we reduced the level of the sub-task level within the Framework scale.

3.2 Micro-Module format Deployment Validation

Having the flexibility of micro modules was at the core of the proposed delivery method and material format in ARISE. This was intended for both the sampling trials and planned final materials for future implementation and exploitation of the ARISE training framework.

Evidence from desktop studies, and positive feedback from market stakeholders, support the micro-module format, enabling flexibility and interoperability, whilst facilitate a mapping with other Qualifications, and/or towards CPD schemes. A bite sized format also aimed to facilitate uptake, addressing some of the identified barriers to learning, primarily time, professionals have. Feedback from trial testing presentations indicated that the micro module delivery of content in short-duration micro-modules with interchangeability options was positively received and welcomed. Furthermore, desktop research validated the ARISE approach of that Micro and bite-size learning. Such small, focused micro units of content, designed to convey specific ULOs and skills knowledge base or concepts are increasingly popular and effective in education and online training. Their benefits are especially relevant in the fields like BIM, where complex information needs to be learned and applied in practical contexts. ARISE followed studies that support the micro-learning format is valuable for the goals of the project, as they can contribute to:

- ***Enhanced Retention and Engagement.*** Micro-learning aligns with cognitive science findings on human attention spans and retention. By breaking down information into manageable segments, learners can focus on one topic at a time, which enhances understanding and memory retention. According to Thalheimer (2019), micro-learning, when implemented correctly, improves recall and is particularly effective for complex subjects that benefit from layered learning.



- *Application: BIM concepts, such as 3D modelling, energy modelling, and 4D scheduling, can be overwhelming. Small, focused modules allow learners to master each area before moving to the next, reducing cognitive overload.*
- **Flexibility and Accessibility.** Micro-learning modules are designed to be interchangeable and can be accessed individually or in sequence, which provides flexibility for self-paced, on-demand learning. Studies by [Hug (2005)] highlight that micro-learning is beneficial for adult learners who may require flexible access due to work or personal commitments.
 - *Application: Professionals in the construction industry often have irregular schedules, and micro-modules that can be accessed on mobile devices or between tasks make it easier for them to fit learning into their routines.*
- **Support Higher Motivation.** Micro-learning encourages learner motivation by offering quick achievements, which is especially beneficial for online and asynchronous learning settings. Research by [Skulmowski and Xu (2021)] found that learners are more likely to stay engaged with short learning segments, which contribute to overall course completion rates. The impact is stronger for digital learning platforms, where motivation tends to wane with long-form content.
 - *Application: BIM, Digital Construction and Sustainability training courses can be extensive and challenging, often covering several complex tools and workflows. Micro-learning provides learners with a clear sense of progress as they complete each module, helping them maintain momentum.*
- **Tailored and Just-in-Time Learning.** Micro-learning can be applied to specific learning needs, providing “just-in-time” support on specific topics or skills when learners encounter challenges. [Reinhardt et al. (2020)] emphasized that micro-learning modules designed for “just-in-time” use



allow learners to apply knowledge directly in their work, leading to a stronger practical understanding and skill retention.

- *Application:* BIM professionals can consult bite-sized modules on specific tasks, such as creating a 4D timeline or integrating energy analysis tools. This approach ensures that training aligns with real-world challenges.
- ***Improved Transfer of Learning in Technical and Practical Fields.*** Studies on micro-learning suggest that short modules improve the transfer of learning, helping learners apply knowledge more effectively. Studies found that bite-sized learning formats were particularly successful in technical fields where practical application of skills is essential.
 - *Application:* For complex technical subjects like Digital Construction, learners benefit from immediately applying what they've learned in small increments, bridging the gap between theoretical knowledge and practical application.

The Framework Skilled and task-based approach, and the Micro-Module format delivery, informed the foundation for the development of the final set of materials. As stated, at initial development of the QF and of pre-production, WP6 considered that the micro modules could be based at Task or sub task “level” of the QF.

However, upon further analysis of the complexity and scope of the QF, several sub-tasks were deemed to be too high in its scope, associated knowledge, and complexity, to be delivered effectively by a single micro-module. Analysis of the complexity of their associate ULOs, their competencies, and its required associated base knowledge level and scope, proved it would be challenging to coordinate consistently with the “bite size” micro module transferable approach.

Therefore, an improved approach was devised, which was delivered and tested during trial delivery, and that forms the basis for the final set of finished materials in this report. ARISE micro modules were set by default at the ULO's and associate knowledge level of the Framework. Some can be higher up, encompassing a full



sub task. But that is considered on basis by basis and depend on the complexity and scope of such task, as well as its maturity skills level (and the estimated equivalent EQF level).

3.3 Core Structure Framework

A set of “training plans” categories were devised to map and further divide the Framework into a deliverable format as previously identified. These were aimed to facilitate deployment of the micro modules, whilst mapping and structuring the progression pathways. It also allows flexibility for adaptation and expansion of the QF to other subjects and skills, as required.

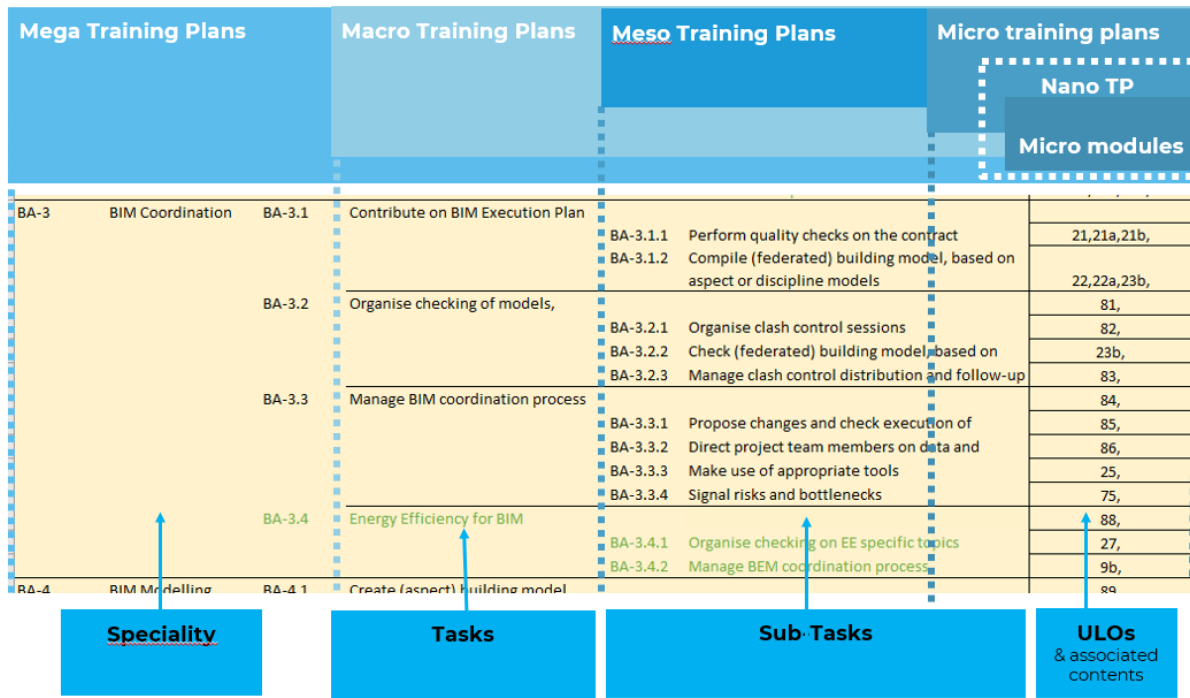


Fig3. concept delivery format of the ARISE QF – Micro-modules & Training Plans

Training Plans				
Category	Framework “Step” Elements Scope	Framework Illustrative Example		
MEGA	Usually set at the Specialism level. Containing a set of modules (and Macro, Meso, Micro, and Nano Training plans).	BIM Modelling, or BIM management, etc...		
MACRO	Mainly set at Task level. Containing a set of modules (and Meso, Micro, and Nano Training plans).	Create (aspect) building model.		
MESO	Mainly Sub-task base. Containing a set of modules (and Micro, and Nano Training plans).	Transform (production) design into building model.		
MICRO	Set mainly at complex ULO/ competence/ specific knowledge. Containing a set of modules (and Nano Training plans).	Proposing (basic solution) a BIM implementation strategy.	Required broad knowledge that bridge and is common to several Specialism, therefore covered in more than one micro module, e.g.: BIM Requirements. BIM Requirements – CDE. BIM Requirement- Software & Hardware.	
NANO	Possible agglomeration or variation of different modules to incentive progression or to signal a step change in indicative EQF level/ level of complexity. Allows a better mapping with external qualification. Containing a set of modules.	BIM requirements EIR I module - would be aimed at EQF level 2 (Understand).	Adding: A BIM requirement EIR II module - would be aimed at EQF level 3 (Explain).	Adding: A BIM requirement EIR III module - would be aimed at higher level 4 (Devise/ Demonstrate/ Apply).
Within and forming the several Trainings Plans we have the MICRO -MODULES				

Table 1. concept of level category of training plans



These categories are conceptual and for indicative purposes. They can be adopted in a flexible way, in a case-by-case approach, depending on the Specialisms and their associated task/ subtask. Some may be able to be covered in full by a “lower bracket training plan category”, or a sub-task possible by a single micro module. This scaling can be adopted to construction alternative pathways, or expansion of the framework to allow adaptability and mapping to other Qualification Systems.

For example, the BIM Basics Specialism, due to the complexity of the Specialisms and associated Task, although conceptually it should be at a higher training plan category as it is a Specialism, for practical effects, measured by number of modules it can contain, a “*Micro*” or “*Meso*” Training plan to cover it.

3.4 Implementation and High-Level Training Plans

This final set of materials is not intended to cover the entirety of the Framework scope. For implementation purposes at this stage, it was considered that that full implementation would be completed and set at the higher-level category of the training plans (*MEGA*).

At present, materials were aimed mainly towards achieving a nano and/or micro level training plan.

In terms of the platform delivery, the subdivisions below the “*MESO*” training plan level, displaying lower levels of Framework mapping in front end, were unfeasible to manage, and have a detrimental effect for current and future users. Therefore, placeholders have been set at the *MESO* (task-based) level. The future project phases of implementation and exploitation can focus on further development of these subdivisions, as per *ARISE* partners expansion intentions.



COURSE LIST | TRAINING PLANS

MODULES TRAINING PLANS SORT BY DATE SORT BY NAME Search here

<p>COMING SOON</p> <p>3</p> <p>arise</p> <p>ENERGY EFFICIENCY FOR PLANNING AND</p> <p>XP 0 ☆ 0 ⚡ 0</p>	<p>COMING SOON</p> <p>5</p> <p>arise</p> <p>USE MODEL INFORMATION FOR QUANTIFYING</p> <p>XP 0 ☆ 0 ⚡ 0</p>	<p>COMING SOON</p> <p>6</p> <p>arise</p> <p>USE MODEL INFORMATION FOR ANALYSIS PURPOSES</p> <p>XP 0 ☆ 0 ⚡ 0</p>	<p>COMING SOON</p> <p>3</p> <p>arise</p> <p>ENERGY EFFICIENCY FOR SIMULATING AND</p> <p>XP 0 ☆ 0 ⚡ 0</p>	<p>COMING SOON</p> <p>5</p> <p>arise</p> <p>USE MODEL INFORMATION FOR ON-SITE PURPOSES</p> <p>XP 0 ☆ 0 ⚡ 0</p>	<p>COMING SOON</p> <p>6</p> <p>arise</p> <p>USE MODEL INFORMATION FOR OFF-SITE PURPOSES</p> <p>XP 0 ☆ 0 ⚡ 0</p>
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Fig4. MACRO training plans Placeholders structure in platform

To guide current and future users and trainers, we have included placeholders in the platform’s training plan section. This will outline the overall pathway tasks required, serving as a guideline for future implementation across a range of options. The current setup in the Platform front end is set at the “MACRO” level-providing indication of the tasks, and then within it, an indicative placeholder of the associated MESO Training Plans. This provides a clear breakdown of subtasks, some of which may be manageable within single micro-modules.

There is flexible for future implementation, as some of those sub-task based placeholders can form as training plans. Others constitute single modules, depending on the complexity of the content. Just as the correspondent ARISE Framework, this forms a conceptual adaptable guideline, implemented within the ARISE platform structure for future training materials creation, organisation, and delivery.

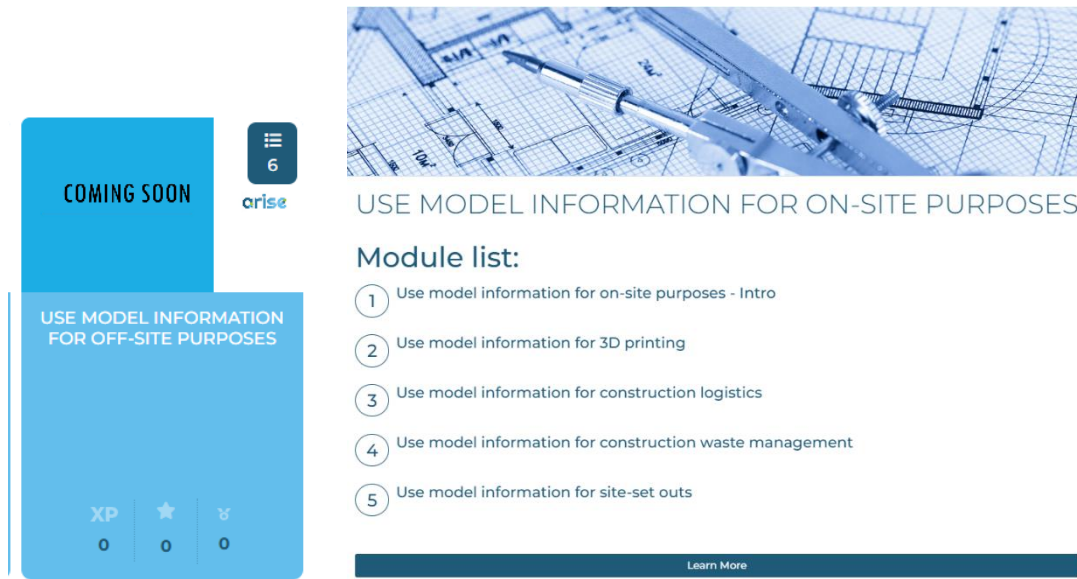


Fig5. MESO training plans Placeholders structure in platform (sub-task based)

A dedicated training Plan was created at trials launch, to provide a qualification that provides a sample of skills ranging from digital skills to BIM tools for Energy. Pathways of training have been developed for the final modules pack, including:

TRAINING PLANS	CONDITIONS & INTEGRATED MICRO-MODULES
BIM BASICS 0.1-Overview (Beginners)	<p>Completed Training Plan-BIM BASICS 0.1-Overview (Beginners) A first step in upskilling on the pathway towards achieving the ARISE Specialism: BIM BASICS. Related Task: understanding BIM Basics. Completed modules:</p> <ul style="list-style-type: none"> • What is BIM? -BIM Fundamentals • BIM Terms & Definitions – Intro <p>Indicative EQF level (guidance): 3</p>
BIM BASICS I-Overview (Beginners)	<p>Completed Training Plan-BIM BASICS I-Overview (Beginners) A first step in upskilling on the pathway towards achieving the ARISE Specialism: BIM BASICS. Related Task: understanding BIM Basics. Completed modules:</p> <ul style="list-style-type: none"> • What is BIM? -BIM Fundamentals • BIM Terms & Definitions – Intro

	<ul style="list-style-type: none"> • BIM Dimensions • Overview of BIM Benefits-intro <p>Indicative EQF level (guidance): 3</p>
<p>BIM BASICS II-Overview (Beginners)</p>	<p>Completed Training Plan-BIM BASICS II-Overview (Beginners) Achieving a first basic beginner's level of the ARISE Specialism: BIM BASICS.</p> <p>Related Tasks:</p> <ul style="list-style-type: none"> • Understanding BIM Basics. • Understand BIM and Energy Efficiency <p>Subtasks:</p> <ul style="list-style-type: none"> • Understand BIM Fundamentals • Understand BIM Dimensions • Understand BIM Benefits • Understand BIM Terms & Definitions • Understand BIM Maturity levels. • Understand BIM and Energy Efficiency <p>Completed modules:</p> <ul style="list-style-type: none"> • What is BIM? -BIM Fundamentals • BIM Terms & Definitions – Intro • BIM Dimensions • Overview of BIM Benefits-intro • BIM Tools for Energy Efficiency - Intro <p>Indicative EQF level (guidance): 3 to 4</p>
<p>BIM BASICS II B-Overview (Beginners)</p>	<p>Completed Training Plan-BIM BASICS II-Overview (Beginners) Achieving a first basic Introductory level of the of the ARISE Specialism: BIM BASICS.</p> <p>Related Tasks:</p> <ul style="list-style-type: none"> • Understanding BIM Basics. • Understand BIM and Energy Efficiency <p>Subtasks:</p> <ul style="list-style-type: none"> • Understand BIM Fundamentals • Understand BIM Dimensions

	<ul style="list-style-type: none"> ● Understand BIM Benefits ● Understand BIM Terms & Definitions ● Understand BIM Maturity levels ● Understand BIM and Energy Efficiency <p>Completed modules:</p> <ul style="list-style-type: none"> ● What is BIM? -BIM Fundamentals ● BIM Terms & Definitions – Intro ● BIM Dimensions ● Overview of BIM Benefits-intro ● BIM Benefits-EE <p>Indicative EQF level (guidance): 3 to 4</p>
<p>BIM BASICS - Digital Construction I-Overview</p>	<p>Completed Training Plan-BIM BASICS -Digital Construction I-Overview</p> <p>BIM is part of the 4.0 revolution in the AEC industry. You have completed the first steps in understanding the wider context of BIM. This is a step in upskilling on the pathway towards achieving the ARISE Specialism: BIM BASICS.</p> <p>Related Task: Understanding BIM Basics.</p> <p>Completed modules:</p> <ul style="list-style-type: none"> ● What is Digital Construction ● Digital Construction Benefits to AEC industry <p>Indicative EQF level (guidance): 3</p>
<p>BIM BASICS - Digital Construction II-Overview</p>	<p>Completed Training Plan-BIM BASICS -Digital Construction I-Overview</p> <p>BIM is part of the 4.0 revolution in the AEC industry. You have advanced further in your first steps in understand the wider context of BIM. This advances you in your upskilling on the pathway towards achieving the ARISE Specialism: BIM BASICS.</p> <p>Related Task: Understanding BIM Basics.</p> <p>Completed modules:</p> <ul style="list-style-type: none"> ● What is Digital Construction ● Digital Construction Benefits to AEC industry ● What is BIM? -BIM Fundamentals ● BIM Terms & Definitions – Intro <p>Indicative EQF level (guidance): 3</p>

<p>BIM MODELLING 0.1-BIM Authoring UI - Views Set (4 Revit)</p>	<p>Completed Training Plan-BIM MODELLING 0.1-BIM Authoring UI - Views Set (4 Revit) First step in upskilling on the pathway towards achieving the ARISE Specialism: BIM Modelling. Focusing on the knowledge of Understanding and using a BIM authoring software UI- mainly relating to navigating UI and views of the model Related Task: Create (aspect) building model Subtasks: All Completed modules:</p> <ul style="list-style-type: none"> ● ARISE_BIM Modelling_Software UI_Navigation (Revit) ● ARISE_BIM Modelling_Software UI_Views Intro(Revit) ● ARISE_BIM Modelling_Software UI_Levels & Plan views(Revit) ● ARISE_BIM Modelling_Software UI_Views: Section & Elevations (Revit) <p>Indicative EQF level (guidance): various- 3 to 6</p>
<p>BIM MODELLING I-BIM Authoring UI (4 Revit)</p>	<p>Completed Training Plan-BIM MODELLING I-BIM Authoring UI (4 Revit) A Milestone in upskilling step on the pathway towards achieving the ARISE Specialism: BIM Modelling. Focusing in the knowledge of Understanding and using a BIM authoring software UI Related Task: Create (aspect) building model Subtasks: All Completed modules:</p> <ul style="list-style-type: none"> ● ARISE_BIM Modelling_Software UI_Hierarchy & Elements (Revit) ● ARISE_BIM Modelling_Software UI_Navigation (Revit) ● ARISE_BIM Modelling_Software UI_Selection tools(Revit) ● ARISE_BIM Modelling_Software UI_Shortcuts(Revit) ● ARISE_BIM Modelling_Software UI_Views Intro(Revit) ● ARISE_BIM Modelling_Software UI_Levels & Plan views(Revit)

	<ul style="list-style-type: none"> • ARISE_BIM Modelling_Software UI_Views: Section & Elevations(Revit) • ARISE_BIM Modelling_Software UI_Visibility Controls I(Revit) • ARISE_BIM Modelling_Software UI_Plugins(Revit) <p>Indicative EQF level (guidance): 3 to 6</p>
Other training Plans were considered conceptually to continue the BIM modelling pathway	
BIM MODELLING II- Model with Standard Preloaded Elements (4 Revit)	
BIM MODELLING III- Model with Customised Elements (4 Revit)	
BIM MODELLING IV- Exporting	
BIM MODELLING V- Publishing	
BIM MODELLING VI- Customising Elements I (4 Revit)	
BIM Modelling-Arch-Residential I_Practice	
BIM Modelling-Arch-industrial or Commercial I_Practice	

Table 2. Examples of the Training plans

Each training plan has a digital badge associated (on the gamification Dashboard, within the platform), equivalent to a milestone open badge.

3.5 Selected final material- Modules Guide and Curriculum outline.

The set of final materials have been improved from the trial sample or created new, following the rigorous testing from the Trial period. At least 40 micro-modules have been created, covering content applicable and transferable (interchangeable-multi ULO coverage) across the groups of the Framework. Within these the set of developed micro modules, some can form a fully constituted qualification Specialism Pathway: BIM Basics. Another is usable to deliver a sample of another pathway, an Architectural based variant, of the BIM Application-BIM Modelling Specialism Qualification.



Other modules cover common base knowledge for ULOs, and competencies that are applicable to several tasks and subtasks within the various Areas; BIM Basics, BIM Support, BIM Utilisation, and BIM Application, especially in the Specialism of BIM Management, BIM Project management, BIM Modelling, BIM Coordination, both BIM Data and System management.

ARISE produced 40 micro-modules that cover and demonstrate multi-criteria benefits of the application of new digitalisation skills towards energy efficiency and can build the capacity of the market drivers and actors. The BIM BASICS related modules are most suitable for professionals at their inception stage of the implementation of digital tools inception phase, building towards application and further development; but also cater to inform and create awareness of benefit on the demand side (clients).

3.5.1 Package of Modules

Module Name	Description	Indicative ULOs
Introductory Group		
01 Self-assessment	An introduction module to allow you to gauge current skills and help learners choose Modules that may be useful to raise the self-awareness of your digital skills.	
0.2 Welcome Trainees	<p>Requirements: N/A (Register as Trainee)</p> <p>Summary: Introduction of ARISE platform and training for users, showcasing and allowing trainees to learn:</p> <p>about the ARISE Project and our objectives; how the training programme works; how it was developed to meet their needs, in whatever role they have in the AEC industry; about proposed</p>	N/A

	<p>Framework/ Matrix of competence, etc; how the overall curriculum is breakdown into micro-sized modules; how the e-platform works, and how to navigate training materials hosted on it; and about our different blended methods of delivery/ teaching and assessment.</p> <p>Deployments tools and links for ARISE project market surveys (Delivered the access to the Feedback surveys of the trial period)</p>	
<p>0.3 Welcome Trainers</p>	<p>Requirements: Register as trainer and be approved as a partner trainer by the ARISE management Team</p> <p>Summary: Support module to be made available to selected Trainers and partners approved by ARISE</p>	<p>N/A</p>
<p>0.4 Resources</p>	<p>Requirements: N/A(Register as Trainee)</p> <p>Summary: to support and assist learners, to access relevant software and resources for the training. Facilitating access (not grating licenses). Mostly relevant in the context of BIM Application-Modelling Training modules. It will provide some assistance in the processes of creating accounts and accessing software, among other guidance.</p> <p>Materials: Self-guided learning- Online instructions and support for users on how to access software for practical tasks on modules and other various resources.</p>	<p>N/A</p>
<p>BIM Basics Specialism</p>		

BIM Basics - Understand BIM Basics		1,2,3, 117, 118, etc
01 What is BIM? BIM Fundamentals	<p>Requirements: N/A</p> <p>Summary: This Micro module is an Introduction to BIM. A quick overview on what they mean, to help professionals, who are: beginning their BIM journey, to grasp fundamental concepts involved in the BIM methodology. This short awareness training will help the user understand the context and essentials of BIM and be able to explain what BIM involves, including why/ how it encompasses all the construction supply chain and built asset/project lifecycle, how BIM is part of a wider process of revolution in the industry. It will help the user to start to identify their role and responsibilities in the process. In addition, it introduces BIM as a powerful enabling tool to help the AEC industry reduce its waste and move towards a more energy-efficient output to help tackle climate change.</p> <p>To implement and collaborate in the BIM process, knowledge of what is BIM, goals, objectives, role in sustainability and energy efficiency. It is part of the BIM Basics overall basic knowledge.</p> <p>Learning Outcomes/Objectives</p> <p>By the end of this short training, learners will be able to: Understanding what BIM is (including some terms and goals) and Summarise/Explain it;</p>	1 and 2
01a Cos'è il BIM? BIM Fundamentals		

	<p>Understanding of the benefits & values of a BIM process</p> <p>For those who already know the subject, this offers a chance to test, prove and record your knowledge. ARISE promotes recognition of pre-acquired knowledge.</p> <p>ULO (s)</p> <p>Understand the context and essentials of BIM-Key Terms of BIM: Summarise some key terms and definitions within BIM.</p> <p>ARISE Framework associate Area(s) BIM Basics</p> <p>ARISE Framework associate Specialism BIM Basics</p> <p>Associate Task & Subtask</p> <p>T- Explain what BIM Means. Understand Bim basics</p> <p>St- Understand BIM Fundamentals</p> <p>Training indicative contents</p> <p>Introduction to BIM concepts</p> <p>Delivery Format-</p> <p>Self-guided learning- Online</p> <p>Tutorial Video Educational Information, links to other resources, and guided self-learning materials.</p> <p>Methods of assessment</p> <p>Summative assessment online test</p> <p>aimed EQF level Level 3+ (indicative benchmark)</p>	
02 Overview of BIM Benefits-Intro	Requirements: N/A	1, 6, 8&118

<p>O2a Panoramica dei vantaggi del BIM - Introduzione-Italian</p>	<p>Summary: This Micro module is an Introduction to BIM benefits. A quick overview of the benefits that BIM brings about. To implement and collaborate in the BIM process, knowledge of what is BIM, goals, objectives, role in sustainability and energy efficiency. It is part of the BIM Basics overall basic knowledge. By the end of this short training, learners will be able to: summarise BIM benefits. For those who already know the subject, this offers a chance to test, prove and record your knowledge. ARISE promotes recognition of pre-acquired knowledge.</p> <p>ULO (s)</p> <p>Understand the context and essentials of BIM- Understanding of the benefits & values of a BIM process</p> <p>ARISE Framework associate Area(s)</p> <p>BIM Basics</p> <p>ARISE Framework associate Specialism</p> <p>BIM Basics</p> <p>Associate Task & Subtask</p> <p>T- Understand Bim basics St- Understand BIM Benefits</p> <p>Training indicative contents</p> <p>Introduction to BIM concepts. Overall, industry digitalisation, specifically the use of BIM technology and processes, can improve and aid many practices within the AEC industry. The learning materials hosted in this training are intended to provide an overview/ summary presentation of such overall benefits.</p>	
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	<p>Delivery Format & materials- Educational Information, links to other resources, and guided self-learning materials. Self-guided learning- Online Methods of assessment Summative assessment online test aimed EQF level Level 3 (indicative benchmark)</p>	
<p>03 What is Digital Construction?</p>	<p>Requirements: N/A Summary: This Micro module is an Introduction to Digital Construction to understand a wider context of BIM For those who already know the subject, this offers a chance to test, prove and record your knowledge. ARISE promotes recognition of pre-acquired knowledge. ULO (s) Understand the context and essentials of BIM- What is Digital construction and role of BIM ARISE Framework associate Area(s) BIM Basics ARISE Framework associate Specialism BIM Basics Associate Task & Subtask T- Explain what BIM Means. Understand Bim basics St- Understand BIM Fundamentals Training indicative contents Introduction to BIM concepts Delivery Format- Self-guided learning- Online</p>	

	<p>Methods of assessment</p> <p>Summative assessment online test</p> <p>aimed EQF level Level 3 (indicative benchmark)</p>	
<p>04 Digital Construction-Benefits to AEC Industry</p>	<p>Requirements: N/A</p> <p>Summary: This Micro module continues the Introduction to Digital Construction to understand a wider context of BIM. But focuses more on the benefits side</p> <p>For those who already know the subject, this offers a chance to test, prove and record your knowledge. ARISE promotes recognition of pre-acquired knowledge.</p> <p>ULO (s)</p> <p>Understand the context and essentials of BIM- What is Digital construction and role of BIM</p> <p>ARISE Framework associate Area(s)</p> <p>BIM Basics</p> <p>ARISE Framework associate Specialism</p> <p>BIM Basics</p> <p>Associated Task & Subtask</p> <p>T- Explain what BIM Means. Understand Bim basics</p> <p>St- Understand BIM Fundamentals</p> <p>Training indicative contents</p> <p>Introduction to BIM concepts</p> <p>Delivery Format-</p> <p>Self-guided learning- Online</p> <p>Methods of assessment</p> <p>Summative assessment online test</p>	

	<p>aimed EQF level</p> <p>Level 3 (indicative benchmark)</p>	
05 Understand BIM Terms & Definitions	<p>Requirements: N/A</p> <p>Summary: This Micro module is an Introduction to Key fundamental BIM terminology. A quick overview on what they mean, to help professionals, who are: beginning their BIM journey, to grasp fundamental concepts involved in the BIM methodology. To implement and collaborate in the BIM process, knowledge of some essential key terms becomes essential. This short introduction covers essential basic important terms, allowing learners to navigate BIM jargon. It is part of the BIM Basics overall basic knowledge. By the end of this short training, learners will be able to: summarise/ Explain some key terms and definitions within BIM. For those who already know about BIM Terminology, this offers a chance to test, prove and record your knowledge. ARISE promotes recognition of pre-acquired knowledge.</p> <p>ULO (s)</p> <p>Understand the context and essentials of BIM-Key Terms of BIM: Summarise/ <i>Explain key terms and Definitions within BIM</i> ARISE Framework</p> <p>Associate Area(s) BIM Basics</p> <p>ARISE Framework associate Specialism</p> <p>BIM Basics</p> <p>Associate Task & Subtask</p>	1 and 2
05a Termini e definizioni BIM		

	<p>T- Understand BIM Basics</p> <p>St- Understand BIM Terms & Definitions Explain some BIM key Terms.</p> <p>Training indicative contents</p> <p>Introduction to essential BIM terms</p> <p>Delivery Format & materials-</p> <p>Educational Information, links to other resources, and guided self-learning materials.</p> <p>Self-guided learning- Online</p> <p>Methods of assessment</p> <p>Summative assessment online test</p> <p>aimed EQF level Level 3 (indicative benchmark)</p>	
<p>06 BIM Dimensions - Intro</p>	<p>Requirements. NA</p> <p>Summary: To implement the BIM process, knowledge of some essential key terms becomes required.</p>	<p>1 & 2 117</p>
<p>06a Dimensioni BIM - Introduzione</p>	<p>Following up on the BIM Terms I module, this continues the Introduction to Key fundamental BIM: overview on what are BIM Dimensions This short training will help the user understand what BIM Dimensions are. How many are usually considered? More importantly, what they entail and how they apply, and can be integral to workflows, to help professionals, who are beginning their BIM journey to grasp concepts involved in the BIM methodology. This training addresses essential concepts of BIM. It is part of the BIM Basics overall basic knowledge. Learning</p>	

	<p>Outcomes/Objectives- After completion of the module, learners will be able to:</p> <p>Explain Key terms and Definitions within BIM, specifically Summarise BIM Dimensions.</p> <p>For those who already know about BIM Terminology, this offers a chance to test, prove and record your knowledge. ARISE promotes recognition of pre-acquired knowledge.</p> <p>ULO (s)</p> <p>Understand the context and essentials of BIM-Key Terms of BIM: Explain some key terms and definitions within BIM.</p> <p>ARISE Framework associate Area(s) BIM Basics</p> <p>ARISE Framework associate Specialism</p> <p>BIM Basics</p> <p>Associate Task & Subtask</p> <p>T- Understand BIM Basics</p> <p>St- Understand BIM Dimensions</p> <p>Training indicative contents</p> <p>Introduction to concept of BIM Dimension</p> <p>Delivery Format-</p> <p>Self-guided learning- Online</p> <p>Tutorial Videos.</p> <p>Educational Information, links to other resources, guided self-learning materials</p> <p>Methods of assessment</p> <p>Summative assessment via written report.</p> <p>aimed EQF level: Level 3+ (indicative benchmark)</p>	
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<p>07 BIM Maturity Stages</p>	<p>Requirements: N/A</p> <p>Summary: This covers one of the essential concepts when trying to understand the context and essentials of BIM. This Micro module is an Introduction to BIM Maturity Stages. A quick overview on what they mean and relation to EE and sustainability, to help professionals, who are: beginning their BIM journey, to grasp fundamental concepts involved in the BIM methodology.</p> <p>Learning Outcomes/Objectives: After completion of the course, learners will be able to: Identify the BIM Maturity Levels (also referred to as BIM Stages).</p> <p>For those who already know about the subject, this offers a chance to test, prove and record your knowledge. ARISE promotes recognition of pre-acquired knowledge.</p> <p>ULO (s)</p> <p>Understand the context and essentials of BIM- Understand BIM Maturity levels</p> <p>ARISE Framework associate Area(s)</p> <p>BIM Basics</p> <p>ARISE Framework associate Specialism</p> <p>BIM Basics</p> <p>Associate Task & Subtask</p> <p>T- Understand BIM Basics St- Understand BIM Maturity levels</p> <p>Training indicative contents</p>	<p>3</p>
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	<p>Introduction to BIM Maturity stages</p> <p>Delivery Format-</p> <p>Self-guided learning- Online</p> <p>Educational Information, links to other resources, and guided self-learning materials.</p> <p>Methods of assessment</p> <p>Summative assessment online test</p> <p>aimed EQF level Level 3 (indicative benchmark)</p>	
BIM Basics - Understand BIM and Energy Efficiency		4, 119
08 BIM Tools for Energy Efficiency	<p>Requirements: N/A</p> <p>Summary: This module introduces the use of BIM tools for energy-efficient design, construction and operation of buildings.</p> <p><i>Learning /Objectives-</i>After completion of the modules, learners will be able to:</p> <p><i>Understanding of the role of BIM in achieving improved sustainable construction and energy-efficient performance.</i></p> <p><i>Understand how System thinking with regards to low-energy building construction. can be applied to deliver substantially better results.</i></p> <p><i>Illustrate how BIM can be utilized to reduce energy loss.</i></p> <p><i>Understanding how BIM tools can be used for energy efficiency</i></p> <p>ARISE Framework associate Area(s)</p> <p>BIM Basics/ BIM Energy/ BIM Application /BIM Utilisation</p>	4, 6, 8 . 9 & 119

	<p>ARISE Framework associate Specialism</p> <p>BIM Basics/ BIM Management, Blm Coordination, Blm project management/ BIM Simulating, BIM Operating and Maintaining</p> <p>Associate Task & Subtask</p> <p>various</p> <p>Delivery Format-</p> <p>Self-guided learning- Online</p> <p>Educational Information, links to other resources, and guided self-learning materials.</p> <p>Online Materials to demonstrate the key principles of System Thinking. <i>“Illustrate the use of BIM tools to reduce energy loss”..</i></p> <p>Methods of assessment</p> <p>Summative assessment online test</p> <p>aimed EQF level Level 3 (indicative benchmark)</p>	
<p>BIM Application & BIM Support</p>		
<p>BIM Support – Project Data</p> <p>BIM Application - BIM Management, BIM Project Management, BIM Coordination- BIM Support</p>		
<p>09 BIM Standards I</p>	<p>Requirements: N/A</p> <p>Summary: The following module aims to describe the standards adopted in the context of the BIM process and its relevance to the industry. Relates to: understanding the application and standards of BIM. A fundamental knowledge required in BIM Basics skills, and required for BIM Application skills, for example in the Specialism of BIM managements, BIM Project management and Coordination. Learning /Objectives: Understand,</p>	<p><i>5,5a,5b, 6,</i></p>

	<p>identify, and summarise the different BIM standards used in the industry.</p> <p>ARISE Framework associate Area(s) BIM Basics/ BIM Support/ BIM Application</p> <p>ARISE Framework associate Specialism BIM Basics/ BIM Management, BIM Coordination, BIM project management/ BIM Simulating, BIM Operating and Maintaining</p> <p>Associate Task & Subtask Various, for example T-Implement BIM strategy ST- <i>Devise BIM strategy</i></p> <p>Delivery Format- Self-guided learning- Online Educational Information, links to other resources, and guided self-learning materials. Online Materials to demonstrate the key principles.</p> <p>Methods of assessment Summative assessment online test</p> <p>aimed EQF level Level 3 (indicative benchmark)</p>	
<p>10 BIM Requirements – EIR I</p>	<p>Requirements: N/A</p> <p>Summary: This Module aims to describe the Exchange Information Requirements in the context of the BIM process and its relevance to the industry.</p> <p>Learning Outcomes/Objectives After completion of the course, learners will be able to: Understand /Summarise what is an EIR. First step towards- Proposing (basic solutions) a BIM implementation strategy for an organisation (partial completion).</p> <p>ARISE Framework associate Area(s)</p>	<p>13, 72, 73 5a</p>

	<p>Various such as: BIM Application - BIM Management, BIM Project Management, BIM Coordination- BIM Support ARISE Framework associate Specialism</p> <p>Associate Task & Subtask Various, for example T-Implement BIM strategy ST- Devise BIM strategy</p> <p>Delivery Format- Self-guided learning- Online Educational Information, links to other resources, and guided self-learning materials. Online Materials to demonstrate the key principles.</p> <p>Methods of assessment Summative assessment online test</p> <p>aimed EQF level Level 3 (indicative benchmark</p>	
<p>11 BIM Requirements - CDE</p>	<p>Requirements: N/A</p> <p>Summary: The following Module aims to describe the Common Data Environment (CDE) in the context of the BIM process and its relevance to the industry.</p> <p>Learning Objectives- <i>Proposing the implementation of BIM in an organisation (Partial Completion). Understanding of the use of cloud-based storage to access and exchange information. Understanding the use of CDE, including arrangements for collaborative working and communication. First steps towards Proposing (basic solutions) for a CDE, including arrangements for collaborative working and communication. And to Manage the project CDE and/or federated data system</i></p> <p>ARISE Framework associate Area(s)</p>	<p>2, 5a 64,65,6 6, 66a 66b, 67,</p>

	<p>Various such as: BIM Application - BIM Management, BIM Project Management, BIM Coordination- BIM Support ARISE Framework associate Specialism</p> <p>Associate Task & Subtask Various, for example T-Implement BIM strategy ST- Devise BIM strategy</p> <p>Delivery Format- Self-guided learning- Online Educational Information, links to other resources, and guided self-learning materials. Online Materials to demonstrate the key principles.</p> <p>Methods of assessment Summative assessment online test</p> <p>aimed EQF level Level 3 (indicative benchmark.</p>	
<p>12 BIM Requirement- Software & Hardware</p>	<p>Requirements: N/A</p> <p>Summary: This Module provides an understanding of the software and hardware requirements of BIM.</p> <p><i>Learning Objectives-</i> After completion of the module, learners will be able to: <i>Understanding requirements</i></p> <p>ARISE Framework associate Area(s) Various, but for example mainly BIM Support</p> <p>Associate Task & Subtask Various, for example T- Manage project data ST- Link user defined project soft- and hardware</p> <p>Delivery Format- Self-guided learning- Online</p>	<p>51</p>

	<p>Educational Information, links to other resources, and guided self-learning materials.</p> <p>Online Materials to demonstrate the key principles.</p> <p>Methods of assessment</p> <p>Summative assessment online test</p> <p>aimed EQF level Level 3 (indicative benchmark.</p>	
13 ARISE_H&S in a Digital Environment Office Base	<p>Requirements: N/A</p> <p>Summary: This module focuses on the use of digital devices in office-based settings. <i>Learning Objectives:</i> After completion of the module, learners will be able to:</p> <p><i>Understanding of the use of digital skills and devices in construction (Partial).</i></p> <p><i>Summarise health and safety considerations for the use of digital devices in an office site context</i></p> <p>ARISE Framework associate Area(s)</p> <p>Various, but for example mainly BIM Support</p> <p>Associate Task & Subtask Various, for example</p> <p>T- Manage project data</p> <p>ST- Link user defined project soft- and hardware</p> <p>Delivery Format-</p> <p>Self-guided learning- Online</p> <p>Educational Information, links to other resources, and guided self-learning materials.</p> <p>Online Materials to demonstrate the key principles.</p> <p>Methods of assessment</p> <p>Summative assessment online test</p> <p>aimed EQF level Level 3 (indicative benchmark</p>	51
14 ARISE_H&S in a Digital	<p>Requirements: N/A</p>	51

<p>Environment Site Base</p>	<p>Summary: Module focusing on the use of digital devices in office-based settings. <i>Learning Objectives:</i> After completion of the module, learners will be able to: <i>Understanding of the use of digital skills and devices in construction (Partial). Summarise health and safety considerations for the use of digital devices in a site context</i></p> <p>ARISE Framework associate Area(s) Various, but for example mainly BIM Support</p> <p>Associate Task & Subtask Various, for example</p> <p>T- Manage project data</p> <p>ST- Link user defined project soft- and hardware</p> <p>Delivery Format-</p> <p>Self-guided learning- Online</p> <p>Educational Information, links to other resources, and guided self-learning materials.</p> <p>Online Materials to demonstrate the key principles.</p> <p>Methods of assessment</p> <p>Summative assessment online test</p> <p>aimed EQF level Level 3 (indicative benchmark</p>	
<p>15 BIM Information Management & Application</p>	<p>Requirements: N/A</p> <p>Summary: This Module seeks to understand and explain information management and the application of BIM.</p> <p><i>Learning Objectives-</i>After completion of the course, learners will be able to:</p> <p><i>Proposing (basic solutions) a BIM implementation strategy for an organisation (Partial Completion).</i></p> <p><i>Proposing the implementation of BIM in an organisation (Partial Completion).</i></p>	<p>1,10, 11,12, 5a</p>

	<p>ARISE Framework associate Area(s) Various, but for example mainly BIM Application</p> <p>Associate Task & Subtask Various, for example</p> <p>Delivery Format- Self-guided learning- Online Educational Information, links to other resources, and guided self-learning materials. Online Materials to demonstrate the key principles.</p> <p>Methods of assessment Summative assessment online test</p> <p>aimed EQF level Level 3 (indicative benchmark)</p>	
<p>BIM Application - BIM Modelling-BIM Utilisation</p>		
<p><i>BIM Application- Modelling- Create (aspect) building model - Transform (production)design into building model</i></p> <p><i>BIM Utilisation-Capturing and Representation</i></p>		
<p>16 BIM Modelling - Title Blocks</p>	<p>Requirements: ideally complete all the software UI modules.</p> <p>Summary: This Module covers how to create and use template files, specifically, Create a Title block. Learning Objectives- After completion of the course, learners will be able to: <i>Understanding of the different discipline models and parametric objects used in the industry (Partial).</i></p> <p>ARISE Framework associate Area(s) BIM Application</p> <p>ARISE Framework associate Specialism BIM Basics/ BIM Management, BIM Coordination, BIM project management/ BIM Simulating, BIM Operating and Maintaining</p>	<p>28</p>

	<p>Associate Task & Subtask Various, for example T- Create (aspect) building model - ST-Transform (production)design into building model</p> <p>Delivery Format- Self-guided learning- Online Educational Information, links to other resources, and guided self-learning materials. Online Materials to demonstrate the key principles. Recommended blended delivery</p> <p>Methods of assessment Summative assessment online test, or Practical Assessment</p> <p>aimed EQF level Level 3 (indicative benchmark</p>	
17 ARISE_BIM Modelling UI- Hierarchy & Elements (Revit)	Requirements: N/A Summary: The following Modules provides an understanding of how to use BIM modelling software interface (Revit version). Learning	28 32
18 ARISE_BIM Modelling UI Selection (Revit)	Objectives- After completion of the module, learners will be able to: <i>Understand Software used to create models/ objects used in the construction</i>	
19 ARISE_BIM Modelling UI Shortcuts (Revit)	<i>Produce documentation to allow exchange within and between the project stages (Partial).</i>	
20 ARISE_BIM Modelling Views Intro (Revit)	More specifically (depending in each module): <ul style="list-style-type: none"> • Hierarchies & Elements that organise the UI 	

<p>21 ARISE_BIM Modelling UI Levels & Plans (Revit)</p>	<ul style="list-style-type: none"> • Navigating the UI- creating views • Selection Tools • Shortcuts-increasing productivity/efficiency within an authoring platform 	
<p>22 ARISE_BIM Modelling UI Elevations & Sections (Revit)</p>	<ul style="list-style-type: none"> • Views • Levels and Plans tools- process of creating and editing levels creating and editing plan views. 	
<p>23 ARISE_BIM Modelling UI Visibility Control (Revit)</p>	<ul style="list-style-type: none"> • Elevations Tools • Visibility and graphical controls • Plugins to increase productivity and efficiency 	
<p>24 ARISE_BIM Modelling UI Plugins</p>	<p>ARISE Framework associate Area(s) BIM Application</p> <p>ARISE Framework associate Specialism BIM Modelling/BIM Coordination</p> <p>Associate Task & Subtask Various, for example T- Create (aspect) building model ST-Transform (production)design into building model</p> <p>Delivery Format- Self-guided learning- Online Educational Information, links to other resources, and guided self-learning materials. Online Materials to demonstrate the key principles. Recommended blended delivery</p> <p>Methods of assessment Summative assessment online test, or Practical Assessment</p> <p>aimed EQF level Level 3 (indicative benchmark</p>	

25 ARISE_BIM Modelling Walls (Revit)	<p>Requirements: Complete UI Modules</p> <p>Summary: The following Modules provide an understanding of how to use BIM modelling (Revit version) to generate BIM models.</p>	29 30
26 ARISE_BIM Modelling Floors (Revit)	<p>Module provides instructions on how to use modification tools, such as preloaded elements and components. Learning Objectives- After completion of the module, learners will be able to:</p>	31a 32b 95
27 ARISE_BIM Modelling Doors (Revit)	<p>More specifically (depending in each module)</p> <ul style="list-style-type: none"> ● Walls ● Floors 	
28 ARISE_BIM Modelling Windows (Revit)	<ul style="list-style-type: none"> ● Windows ● doors ● Ceilings ● Etc... 	
29 ARISE_BIM Modelling Ceilings (Revit)	<p><i>Learning Objectives</i>-After completion of the modules, learners will be able to:</p> <p><i>Understanding of the different discipline models and parametric objects used in the industry (Partial).</i></p> <p><i>Create standard BIM Models (preloaded elements and customise)</i></p> <p><i>Understanding how to detail designs and models on a technical level."</i></p> <p>ARISE Framework associate Area(s)</p> <p>BIM Application, BIM Utilisation</p> <p>ARISE Framework associate Specialism</p> <p>BIM Modelling/BIM Coordination, BIM Capturing and Representation</p> <p>Associate Task & Subtask Various, for example</p> <p>T- Create (aspect) building model</p> <p>ST-Transform (production)design into building model</p> <p>Create 3D visualisations and 2D plans and -views.</p>	

	<p>Also covering(partial)</p> <ul style="list-style-type: none"> •Understanding of what Information and documentation can be produced from models. •Applying change control procedures to allow exchange within as well as between the project stages. •Producing documentation to allow exchange within as well as between the project stages. <p>Delivery Format-</p> <p>Self-guided learning- Online Educational Information, links to other resources, and guided self-learning materials. Online Materials to demonstrate the key principles. Tutorial/lesson videos Recommended blended delivery</p> <p>Methods of assessment</p> <p>Summative assessment online test, or Practical Assessment</p> <p>aimed EQF level Level 4+ (indicative benchmark</p>	
<p>BIM Application, BIM Support BIM Utilisation</p>		
<p>Support BIM Utilisation - Capturing and Representation</p>		
<p>31 ARISE_BIM Modelling & interoperability- Export IF</p>	<p>Requirements: Complete UI and modelling Modules (recommended but not mandatory)</p> <p>Summary: This Module covers how to export to IFC format from a BIM authoring software (Revit version).</p>	<p>30</p>

	<p>Learning Objectives After completion of the module, learners will be able to: Understanding of what Information and documentation can be produced from models; Applying change control procedures to allow exchange within as well as between the project stages; Producing documentation to allow exchange within as well as between the project stages.</p> <p><i>Understanding how to detail designs and models on a technical level.”</i></p> <p>ARISE Framework associate Area(s)</p> <p>BIM Application</p> <p>ARISE Framework associate Specialism</p> <p>BIM Modelling/BIM Coordination</p> <p>Associate Task & Subtask Various, for example</p> <p>Create aspect model</p> <p>Capturing and Representation</p> <p>Delivery Format-</p> <p>Self-guided learning- Online</p> <p>Educational Information, links to other resources, and guided self-learning materials.</p> <p>Online Materials to demonstrate the key principles.</p> <p>Tutorial/lesson videos</p> <p>Recommended blended delivery</p> <p>Methods of assessment</p> <p>Summative assessment online test, or</p> <p>Practical Assessment</p> <p>aimed EQF level Level 4+ (indicative benchmark</p>	
<p>BIM EE Overview</p>		

<p>32- <i>ARISE_Energy Gains-Losses-Usage-Efficiency: Key Terms</i></p>	<p>Requirements: N/A</p> <p>Summary: This covers main terms connected to EE.</p> <p>ARISE Framework associate Area(s) BIM Application</p> <p>ARISE Framework associate Specialism BIM Modelling/BIM Coordination/BIM management</p> <p>Associate Task & Subtask Various, for example Embedded in Energy Efficiency for Operating and Maintaining</p> <p>Delivery Format- Self-guided learning- Online Educational Information, links to other resources, and guided self-learning materials. Online Materials to demonstrate the key principles. Tutorial/lesson videos Recommended blended delivery</p> <p>Methods of assessment Summative assessment online test, or Practical Assessment</p> <p>aimed EQF level Level 4+ (indicative benchmark)</p>	
<p>BIM Application- Coordination & project management</p>		
<p>33 ARISE_BIM 4D I-Understand use of 4D BIM tools</p>	<p>Requirements: N/A</p> <p>Summary: Understand role and benefits of 4D</p> <p>ARISE Framework associate Area(s) BIM Application</p> <p>ARISE Framework associate Area(s)</p>	

	<p>BIM Application</p> <p>ARISE Framework associate Specialism</p> <p>BIM Coordination/ BIM project/ BIM management</p> <p>Associate Task & Subtask Various,</p> <p>Delivery Format-</p> <p>Self-guided learning- Online</p> <p>Educational Information, links to other resources, and guided self-learning materials.</p> <p>Online Materials to demonstrate the key principles.</p> <p>Tutorial/lesson videos</p> <p>Recommended blended delivery</p> <p>Methods of assessment</p> <p>Summative assessment online test, or</p> <p>Practical Assessment</p> <p>aimed EQF level Level 4+ (indicative benchmark</p>	
<p>34 ARISE_BIM 4D II-Timeliner (Navisworks)</p>	<p>Requirements: N/A</p> <p>Summary: Applying 4D scheduling and animation</p> <p>ARISE Framework associate Area(s)</p> <p>BIM Application</p> <p>ARISE Framework associate Specialism</p> <p>BIM Coordination/ BIM project/ BIM management</p> <p>Associate Task & Subtask Various,</p> <p>Delivery Format-</p> <p>Self-guided learning- Online</p> <p>Educational Information, links to other resources, and guided self-learning materials.</p> <p>Online Materials to demonstrate the key principles.</p>	

	Tutorial/lesson videos Recommended blended delivery Methods of assessment Summative assessment online test, or Practical Assessment aimed EQF level Level 4+ (indicative benchmark)	
Modules supporting Events		
35 WORKSHOPS_ implementation of sustainable energy & Digital Skills	Modules to facilitate delivery of Workshop and follow-up survey and conclusion report	
36 WORKSHOP CONFERENCE_A I Sustainability & BIM for Design and Construction		
37 Workshop- Aula virtual- BIM modelling	Module to facilitate delivery of blended class relate to full pathway of BIM Application- BIM Modelling	30 31a 32b 95

Table 3. List of modules for final package (Please for reference purpose refer to WP3, D3.3 report, Appendix A & B)

3.5.2 Multilingual contents

As indicated in the table some modules have been translated to Portuguese, and others to Italian, during trial stage to enhance uptake. The Italian translation was completed in initial trial phase and created as separate modules. However, the Portuguese content, has been embedded into the original modules, using the



multilingual tools deployed to the platform. When a user changes to Portuguese language within a module, then contents displayed will match language (if available). The flag filter icons allow users to filter the ones with other language contents.

3.5.2 Additional modules

Further modules were developed with the intention of possible short-term release, and implementation post project end date. The production of further modules was initiated during Trials and was still being carried out on end date of project lifetime, with ready for deployment in very short timeframe.

At start of the trials, and based on skills gap surveys, WP6 set an ambitious proposed intentional Plan to develop a larger number of modules, as referred in report D6.3. Due to required production times, which was underestimated at the early conception of the ARISE project, not all were able to be finalised and deployed at project end date. Whilst not including in the table 1 listing they should be released soon.

3.6 Module's learning material overview

WP5 (TU Dublin) and WP6 (BMC) collaborated to ensure that a broad selection of material was made available. This material was then deployed within the ARISE platform following training methodologies established earlier in D 5.1 and tested with the users. Details on these materials have already been covered in the companion report from WP5, D5.4. However, we have included a summary in the context of this report also, to provide clarification and overview purposes.

Materials in modules include:

1. Problem/Project-Based Learning.
2. Online platform integrated books and lessons
3. Interactive Narrative Videos.
4. Guided Self-Study.



5. Web-Based Lectures/Tutorials.
6. Case Studies.
7. Gamified formative assessments
8. Practical 3D Model Assessments.

To assist users with self-guided clear navigation, we standardised the Module's format to follow a common structure. For example all modules have the following sections:

- Introduction
- Disclaimer
- Learning Sections
- Summary (when Applicable)
- Formative assessment (when applicable)
- Summative assessment
- Bibliography

3.7 Assessment tools

3.7.1 Format Examples

Modules contain assessments to ascertain and validate the level of knowledge acquired by the user as they complete a Module. The assessments were selected based on the international best practices in collaboration between TUDublin and Belfast Met assessment content and requirements.

A different range of assessments, from formative to summative assessment, were implemented to meet the needs of the module criteria, whilst supporting and meeting user needs. The following examples of assessment methods were used throughout a range of modules:

- **Drag and drop and other gamified tests examples**

Gamified tests with interactive drag and drop content were also used as examples, e.g.: *Maturity Levels module*.



Links to other third-party gamification tools were integrated for self-learning formative assessment, e.g: *H&S in Office-Environment* Module.

- **Online tests (quiz)**

Priority was assigned to modules that covered knowledge and skills at indicative EQF level 3, as these could be assessed in a more theoretical way. This could be covered via online multiple-choice tests.

- **Guided Self-Learning Assessment**

This type of assessment requires the student to demonstrate several tasks because of their lessons from the modules.

- **Analytical assessment/ written assessment**

As we gave priority to modules that covered knowledge and skills at indicative EQF level 3, these were not a requirement. But as we move up the Qualification Framework toward more complex and higher level 8 indicative EQF 4 and above) these will become required to fulfil criteria of assessment at that high level. We avoided these during the Trial stage as they are not as engaging and take more time for users to produce and require a higher Trainer time to evaluate (not automatic process). These are more deemed to employ now towards future implementation.

- **Practical Assessment**

Based on practical tasks such as export a file, create a file, modelling operations, model checking etc.

3.7.2 Evaluation and feedback mechanisms

3.7.2.1 Evaluation

To ensure a robust evaluation and validity of results, a series of tools were employed. For example, in quizzes and online tests, tools such as shuffling questions, shuffling answer order, and random selection of questions from a pool of questions for each individual user were used. These form an example for continuous future implementation.



Also, the size and quantity of questions in the online tests required per module were adapted depending on the duration and complexity of the subject. A minimum pass mark was established to be of 60% plus. This is above and beyond some of the pass criteria other online or traditional qualification in both secondary and post-secondary Education. The benchmark was set to ensure validity of knowledge and skills acquired by learners and to assist in the mutual recognition achievement to learners, as well as to facilitate possible mapping to other qualification standards. For some of the tests of a more practical nature, for example related to software user interface the criteria were set higher.

A set of practical formative assessment were also produced for certain modules. Summative assessments were developed with a more project based, or assignment/ written assessment format too.

3.7.2.2 Evaluation

Platform caters for a series of feedback embedded tools, for example:

- Online tests feedback tools

Quizzes have feedback integrated. Upon completion of the tests, with results students will be able to see what subjects they have not fully answered. Feedback can be supplied at each question level, and/or implemented per grade brackets. Either or both options to be used as per nature and complexity of subject.

- Practical or file submission-based assessment also have feedback tools. Assigned Tutor can provide direct feedback when marking practical submission, Eg: In the Titleblock and *IFC Export* modules, when assigned a pass grade in the assessment, a feedback box can be filled by the trainer to provide relevant feedback to learners.
- For practical assessments assessment, the use of marking rubrics was also recommended.



These can be either uploaded to the platform in the assessment, or incorporated as feedback evaluation, or in the future, possibly integrated as automatic rubrics into the platform, on relevant module's assessment.

3.8 Gamification & badging setup

The gamification features were set for the modules, with XPs attributes and activity stars when applicable or suitable. These can be modified if necessary following future reviews, with updates applied proportionally to all users. Completion badges were set to both reward and stimulate gamification and further progression, whilst also to permit the recognition of acquired skills. LTI codes are set for correspondent Open badges and generated as per methods outlined in D4.8.

3.9 Adaptability and recognition

All modules were designed to be adaptable in terms of EQF Levels, thus enabling at the same time recognition of learning when mapped to other qualifications. The micro modules provide scaffolded learning to enable progress towards higher skills maturity as set high with the QF with additional of modules of learning. Furthermore, this supports the mapping the QF to EQF levels of NQF and other schemes., including CPDs.

Timescales or periods of learning have been attributed to each module to support mapping to CPD style activities. Such activities are clear within the module, including assessment criteria and method, ULOs and associated tasks. This facilitates the mapping, and transferability recognition for CPD recognition., as per developed D7.2 exchange model.

3.10 Trainer's guides & templates

As referred in D.6.5 Report, a trainer's module has been developed for deployment. This is aimed for future exploitation of the project. A set of video instructions on usage of the platform were created and can be made available to future trainers. A guide of usage of the platform for trainers was provided by WP5 and can be found in D.6.5 Report. Excerpts of that report can also be integrated into the



Trainers modules. Also, in the platform, a template module (Moodle “course”) has been created, invisible on the front end, that can be used by trainers as basis of new modules, with all the standardised sections. Trainers and then fill in the specifics of each individual module, e.g. ULOs, tasks and Subtask to which it relates, objectives, etc. These can then be populated with the relevant materials and assessments. For further related details on this please refer to D5.4 report, section 3.2.

4. Conclusion

An approach to the Framework deployment was developed by WP6, together with WP5, in consultation with WP3, to be deployed in the Platform developed by WP4. The approach had a few iterations during pre-production and then during production.

The work was informed and validated by the feedback from users and internal testing and moderation.

The initial concept of a micro-modules approach, set at a sub-task was deemed too rigid and not the most suitable. It was not practical to achieve maximum benefit of micro-module bite size format, with transferability of common knowledge/ skills.

An alternative, still based and rooted in the Framework task based approach, was devised. Micro-modules would be set primarily at the Knowledge and ULO's / competencies level, connected to subtasks. The use of training plans, supports users as them complete modules and consequently work their way up the Framework scale.

This approach also allowed us to use and maximise the management features and tools available in the platform. The platform ability to create training plans from modules was key.

This is also compatible with the digital badging, both for gamification and Open badges attribution (both individual per module as well as milestone badges



(certificates”) as users move up the qualification pathways. It enables a more flexible mapping with other qualification and adaptation to CPD schemes.

Due to the nature of the knowledge base and maturity levels (eg: indicative EQF level 4 to above), ARISE focused on the creation of modules which assessment methods that could better assist a bended delivery while providing adequate assessment to validated knowledge level required. Most modules were aimed at an indicative EQF 3 to 4. However, when grouped together they can form the knowledge base of higher maturity skills, set as EQF level 4 onwards.

A set of 40 modules has been created that covers content applicable across main groups of the Framework. Within those, some can constitute a full Specialism Pathway for BIM Basics. Other modules are usable to deliver a sample of one the variants (Architecture based) to the BIM Application-BIM Modelling, Specialism Qualification, as others cover ULOs and that are common across the framework.



Fig6. MESO training plans Placeholders structure in platform (sub-task based)



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