Attractive, Acceptable and Affordable deep Renovation by a consumers orientated and performance evidence based approach

Contract No.: 784972

Report: Integration of existing BUILD UP Skills functionality within TripleA-reno
Type: web-based software & app for use on smartphones

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Prepared for:
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Glossary of terms

Accreditation
Accreditation is a quality assurance process under which services and operations of (educational) institutions or programs are evaluated by an external body to determine if applicable standards are met. If standards are met, accredited status is granted by the appropriate agency. (Wikipedia)

API
Application Programming Interface. This is used to query separate databases in a secure way.

BIM-Skills Matrix
A Qualification Framework developed in H2020 BIMplement, usable to connect tasks and related subtasks to Unit of Learning Outcomes, BIM-elements and RIBA project phases

BIMplement Qualification Framework
The BIMplement Qualification Framework consists of a flexible methodology that allows definition of professional activities, related skills, required competences in order to achieve a desired quality in the field of nZEB. It is setup as a set of re-usable classifications. These classifications can be used in BIM-projects to describe items in a standardized, unified way and to link them to existing classifications that describe involved technologies, project-stages and involved actors.

BUILD UP Skills
The BUILD UP Skills initiative is an initiative from the EU commission for accelerating massive upskilling of the workforce required for sustaining the Built environment

co-creator platform
A digital environment in which stakeholders and the building sector cooperate in creating successful nZEB concepts

Competence
The ability of an individual/organisation to do something effectively. It consists of a cluster of related abilities, commitments, knowledge, and skills that enable a person (or an organization) to act effectively in a job or situation.

CPD
Continuing Professional Development (CPD) is a structured way of maintaining and developing your competence as a qualified professional by engaging in regular learning activities. CPD can be either structured or informal. “Structured” CPD will often be in a classroom, though it can also be through distance learning or online learning. Structured CPD activities will have clear learning aims and outcomes which will have been given to you by a teacher, speaker or tutor. Informal CPD will usually mean quick, free and self-directed activities, such as reading. It may not always be obvious that these informal activities are CPD, but if you can learn from them, they can help you to stay up to date in a general way.

Cross-level
Interactions between persons with different EQF-levels. For example between white collars and blue collars

Cross-trade
Interactions between persons with a different occupation/trade/profession
The European Qualifications Framework (EQF) is a translation tool that helps understand and compare qualifications awarded in different countries and by different education and training systems.

Its eight levels are described in terms of learning outcomes: knowledge, skills and competences.

**Just in time and just in place learning**
Learning at the right moment and on the right place

**Learning loops**
A loop that enables learning within a project, within multiple projects and within a system. (See the GA for more information.

**Multi-layered qualification**
A multi-layered qualification is a description of tasks that have to be performed to be effective. It consists of a layer with basic tasks and one or more layers of context specific layers. For example nZEB related tasks, BIM-related tasks or Indoor air quality (IAQ) tasks.

**Occupation**
An occupation is a job or profession

**Post-initial training**
Training people receive after leaving initial training. In general, professional post-initial training is based on demand from market parties for retraining. These (short) trainings results most times in a certificate, which offers a limited validity. They do not result in the earning of a certain EQF level.

**Profession**
A profession is a specialized occupation characterized by profession specific education and training.

**Qualification**
A pass of an examination or an official completion of a course, especially one conferring status as a recognized practitioner of a profession or activity.

**Qualification schemes**
A validated scheme with Unit of Learning Outcomes usable for education and training purposes

**Self-inspection**
Inspection by the involved worker itself. The worker who applies a material or installs a measure is performing an inspection of his/her own work

**Self-instruction**
An instruction that is notified to the involved professional and then successfully digested/followed. For example a step by step installation manual

**Unit of Learning Outcome**
A Unit of Learning Outcome is an element of a Qualification Scheme describing a coherent set of a competence, skills and knowledge involved.
1. Introduction

The TripleA-reno concept involves addressing the performance gap between designed and realized performance by implementing a general approach for quality improvement enabled by Continuing Professional Development (CPD) and underlying Qualification Schemes (QS). As there is an increasingly strong body of evidence available on the ‘performance gap’ relating to energy consumption. There is also a growing interest in the measurable aspects of indoor environmental quality and personal health. Both elements will be addressed. TripleA-reno will tackle this issue by:

1. involving the occupants/consumers in the project and collect real performance data in use;
2. implementing methodologies on enhanced quality control of related projects like IEE QUALICHeCK and H2020 BIMplement.

In order to tackle the challenge a 3-level gamified platform is in development. With on Level 1 co-design in design phase, on Level 2 Quality assurance during construction phase and in Level 3 performance monitoring in the in use phase. Gamification will be implemented to nudge the users of the platform.

In work package 3 content, design, game-rules and user-stories needed to fill the TripleA-reno platform are delivered and hooked up to a voluntary certification scheme for achieved quality and performance.

Figure 1 Visualisation of the TripleA-reno platform

This deliverable will address the Integration of existing BUILD UP Skills functionality within TripleA-reno, including self-inspection, enriched by adding life-long-learning ‘missions’ defined in the TripleA-reno Game-engine and served within the BUILD UP kills advisor-app.
2. The TripleA-reno approach on Quality Assurance

TripleA-reno is focusing on:

a) Using just in time and just in place learning tools to deliver self-instruction content and to foster self-inspection of realized quality; based on open standards to make easy (future) implementation in BIM and other quality and planning systems possible.

b) Triggering and encouraging workers and professionals to take responsibility (by gamification) using the data collected to enable learning loops for ‘the solution’ providers.

With the objective to create awareness of workers and professionals about each other’s responsibilities and required skills, cross-level and cross-trade. With as a result optimized solutions, products and a renovation process that delivers quality and performance.

In order to reach these goals several elements have to be addressed.

1. A task based qualification; addressing all knowledge, skills and competences needed.
2. A process oriented workflow; enabling just in time and just in place delivery of learning content
3. Interactions / tools for learning and Quality Assurance (QA); for empowering learning and QA.
4. Links to design phase and ‘formal’ inspection; for assuring that cross-phase learning is silvered and quality assured.

The task based qualification and the process oriented workflow are introduced and described in deliverable “D3.3 Database and API functionality to facilitate implementation of quality certifications”.

D3.5 gives an overview of the integration of existing BUILD UP Skills functionality links to Interactions for learning & quality assurance and to linking those interactions to design and inspection.

Interactions for learning & Quality Assurance

Linked to Design and inspection

Figure 2 Elements in the TripleA-reno approach addressed in this deliverable
2.1 Interactions for learning and Quality Assurance

The BUILD UP Skills advisor app hosts three kind of activities. The first one is a catalogue of learning opportunities such as courses, e-learning and short question sets about ‘building errors’. The second one is the functionality to perform self-checks by workers. The third one is the possibility for a worker to be found as a recognised craftsman by potential clients.

2.1.1 Learning

Concerning learning, training and qualification schemes should ensure that worker qualifications keep pace with the technical complexity of renovation process of the buildings and building components and to make sure that workers are updated on technological development also educational seminars. TripleA-reno level 2 functionality will facilitate the workers with relevant knowledge needed to create the right performance. Awarding of using and/or contributing to inspection protocols will be strengthened by earning XP-points linked to personal professional development and/or keeping earned recognitions fresh.

Overview of the BUILD UP Skills advisor-app

The BUILD UP Skills advisor-app has several linked elements:
1. A course database with tagged online and offline learning interactions
2. A personal profile with a track record and personal notification settings
3. An LTI link to external e-learning systems, such as aNewSpring
4. A building errors interactions that enables to learn from real practice.

For communication between the different IT-elements (the TripleA-reno website and the gamification engine) a secure Application Programming Interface is used.
2.1.2 Quality Control

Concerning the quality control, and the derived (voluntary) labelling schemes, different professions and professional levels are identified for the specific crucial topics needed for deep renovation (nZEB technologies, concepts, products), as a function of the phases in the construction process.

TripleA-reno level 2 functionality facilitates:
- workers and designers with small and relevant inspection protocols & tools to enhance these protocols.
- home owners with easy to understand quality reports and means to hire affordable assistance of certified Quality Assurers / Inspectors.
- Level 2 functions can be extended to public building appliance as well as referencing public procurement as an instrument that could link / encourage certified quality assurance.

Workers and designers

For workers and designers functionality is developed that can be used for quick and easy creation of visual quality inspections/self-checks. In the following screens an overview of the functionality available at M18.

![Figure 4 Overview of available inspections/self-checks](image-url)
**Ventilatie**

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**Figure 5 Overview of an inspection**

**Figure 6 Development of an inspection by adding feedback for a wrong situation**
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Figure 7 Screenshots from the BUILD UP Skills advisor-app including inspections
2.2 Linked to design and inspection

In order to link to design and inspection mockups for both Home owners and Inspectors have been made. This functionality is currently under development. It will be tightly connected with the gamification engine.

2.2.1 Home owners

In order to find a recognised craftsman a mobile website is available.

Figure 8 Mockups for ordering and viewing the results of an inspection

Figure 9 Alpha version of the mobile website to find a recognised craftsman
2.2.2 Inspectors

Figure 10 Mockup of a screen for inspectors to give a second opinion on an inspection

Figure 11 Mockup of validation of an inspection by an inspector

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