

Enhance

Maintenance - Production - Quality

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and MorocCan transition to industry 4.0 Era / ENHANCE**

D2.5 The Lifelong eLearning (LeL) platform

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Executive Summary

The Lifelong eLearning (LeL) platform is one of the main deliverables of the ENHANCE project. It gathers all the 42 training activities developed by the ENHANCE partners and allows to manage access for students and teachers. One LeL instance of the platform is deployed in each PC institution. The exploitation plan is proposed to maximise the use of the proposed content for training students, for upskilling lectures, for support PhD student in the exploration of new concepts, etc.

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1. Introduction

This document is developed as part of the ENHANCE project to provide some details about the exploitation capabilities of the LeL platform by the four partner country institutions.

1.1. Purpose of the document

The proposed document will help to understand how the LeL platform is organised, how and where the instances will be deployed, and the exploitation capabilities of these instances per partner country institution.

1.2. Reference documents

The LeL platform gathers the outcomes of the following deliverables: D2.2, D2.3, and D2.4.

1.3. Applicability

This document will be used by the ENHANCE partners to share information about the exploitation capabilities of the ENHANCE LeL platform.

1.4. Definitions

NA

1.5. Structure of the document

The deliverable is organised in 5 sections:

- Section 1: Introduction
- Section 2: ENHANCE project overview
- Section 3: the LeL platform organisation model
- Section 4: the LeL platform deployment
- Section 5: the LeL platform exploitation models.

1.6. List of acronyms

HEI: Higher Education Institutions

LeL: Lifelong eLearning platform

MPQ: Maintenance, Production and Quality

PC: Partner Country

2. ENHANCE project overview.

ENHANCE – strENgtHening skills and training expertise for TunisiAN and MorocCan transition to industry 4.0 Era – is an Erasmus Plus project founded under the KA2 Cooperation for innovation and the exchange of good practices (Capacity Building in the field of Higher Education) programme by the European Commission under Grant Agreement N° 619130, to be conducted in the period January 2021 until January 2024. It engages 7 partners from 5 countries with a total budget of 779k€. Further information can be found at <http://eplus-enhance.eu/>. Figure 1 gives an overview of the ENHANCE project organization.

The emergence of industry 4.0 concepts and applications brings new paradigms impacting all the industrial business domains when they need to conduct successful digital transformations or increase workshops connectivity. The evolution of Maintenance, Production and Quality Engineering (MPQ 4.0) represents the main application domains where Industry 4.0 produces effective beneficial results.

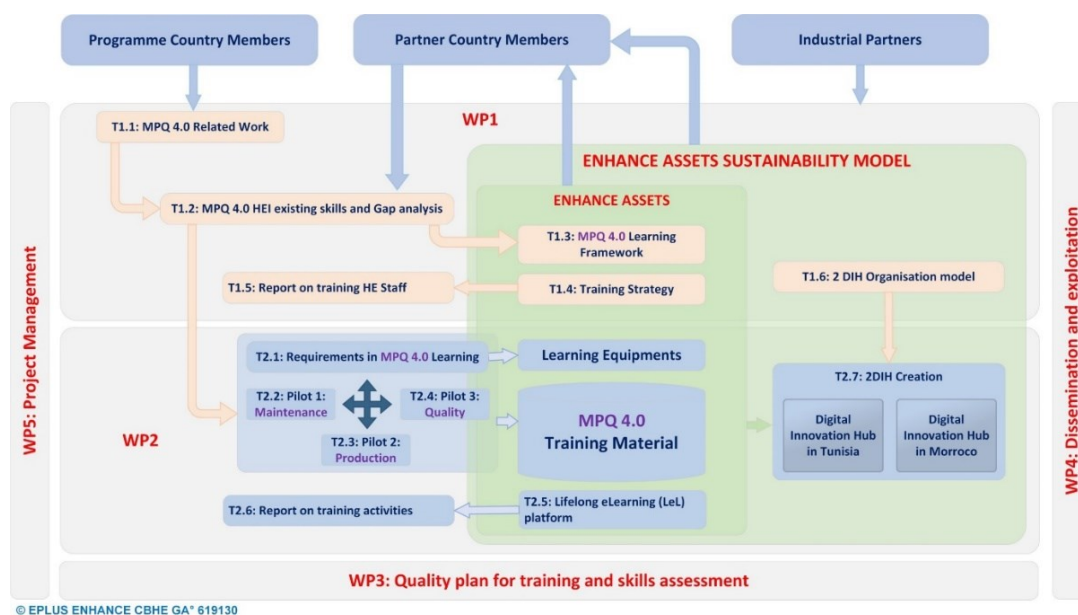


Figure 1. ENHANCE project organization.

The ENHANCE project focuses on building new MPQ training capacities at Higher Education Institutions (HEI) in Tunisia and Morocco to establish interactions between the following stakeholders:

- European universities and research institutions (from France, Germany and Portugal) confirmed MPQ 4.0 competencies, training materials, collaborative research projects, full operational Digital Innovation Hubs (DIH), technology transfer experiences, etc.
- Partner country universities (from Tunisia and Morocco) with teaching and training activities in MPQ and existing connections with their local industrial partners.

The ENHANCE project will create several outputs and two primary tangible outcomes:

- New MPQ 4.0 equipment and training materials developed in connection with the existing training programmes and consolidated through three industrial pilots. The new material will be used to train the trainers and the students in the different partner country universities.
- Three DIHs, two in Tunisia and one in Morocco to sustain the project outcomes through their reuse for training in industry.

ENHANCE aims to become the reference model for creating effective and sustainable training material for MPQ 4.0 in both partner countries with content approved by academia and industry.

3. The LeL platform organisation model

The ENHANCE consortium commits to provide a generic organisation model to be adapted according to each partner institution requirements. Figure 2 presents the connexion between the LeL organisation of the activities and a generic representation of a training department or a DIH.

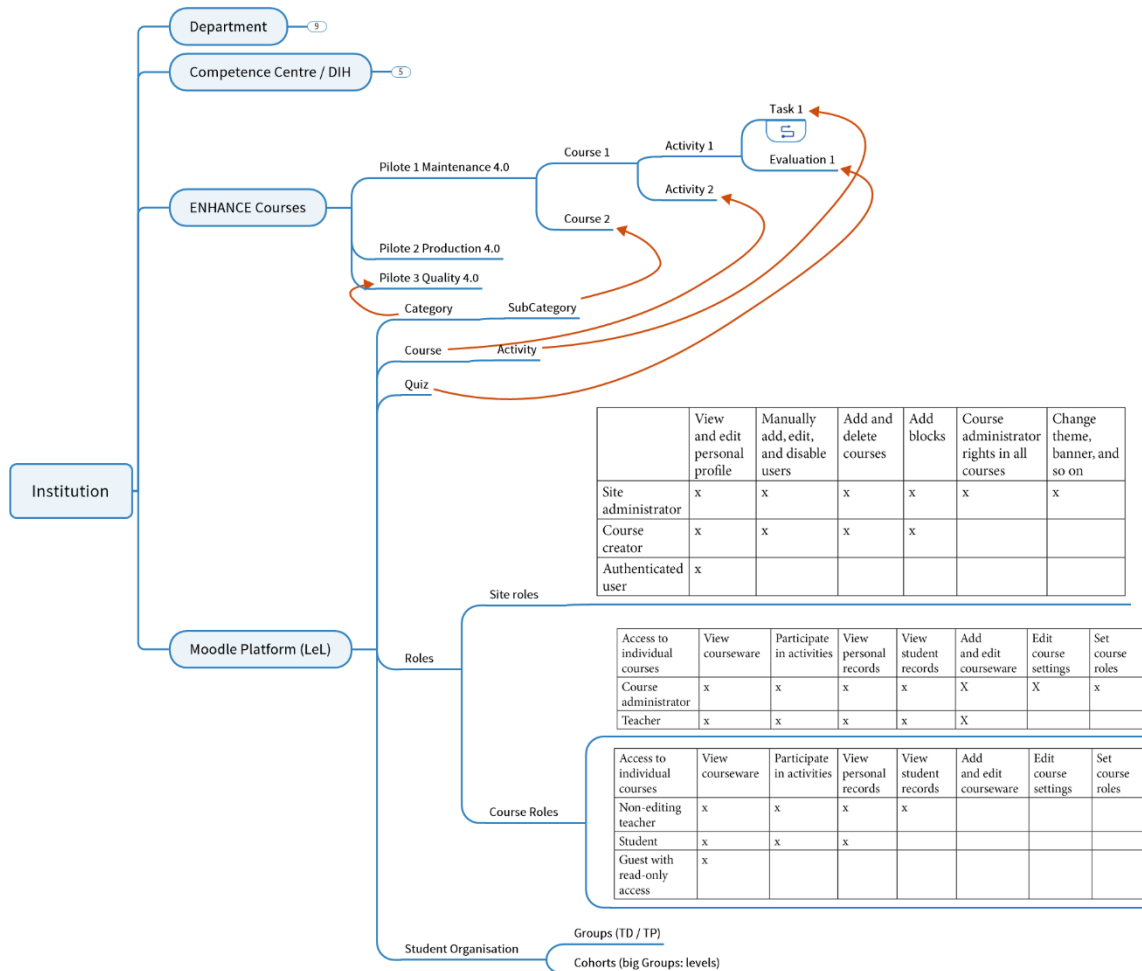


Figure 2: Organisation nodes of the ENHANCE training activities.

The concept defined in the organisation of the ENHANCE training materials can be mapped with concepts defined in the Moodle platform as defined in Table 1:

Table 1: Moodle / ENHANCE concepts mapping

ENHANCE	Moodle
Pilot	Category
Course	Sub-category
Activity	Course
Task	Activity

The organisation of the activities inside the LeL platform can be illustrated in Figure 3 and Figure 4. In figure 3, we illustrate the presentation of Moodle categories and subcategories. In figure 4, we illustrate the presentation of Moodle subcategories and courses.

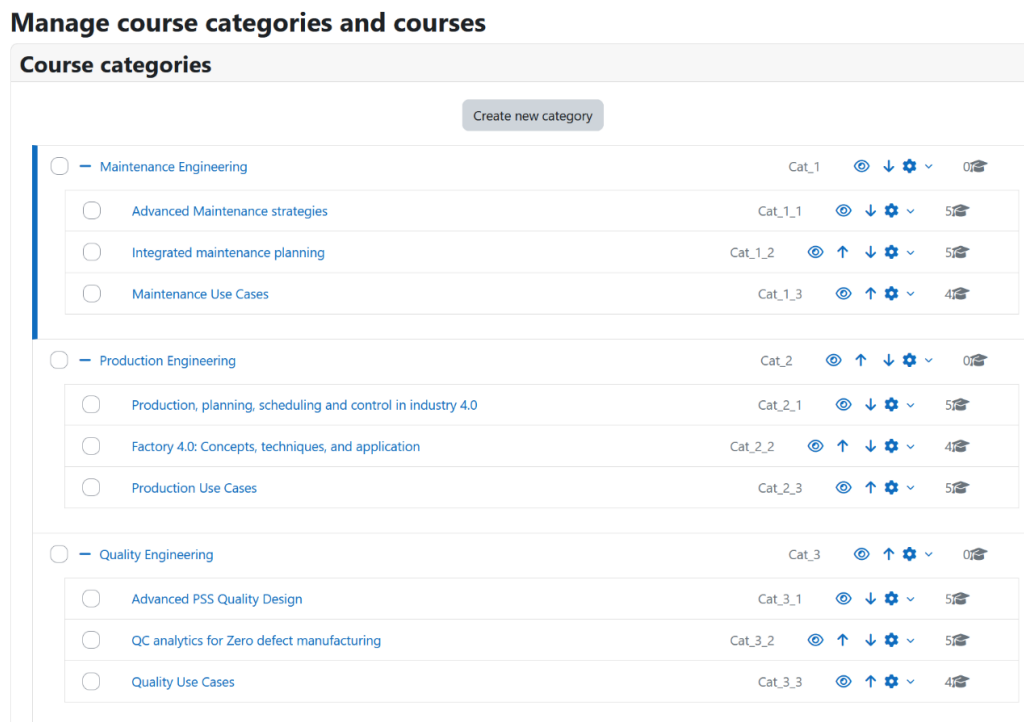


Figure 3: Organisation of training courses and uses cases in Course categories.

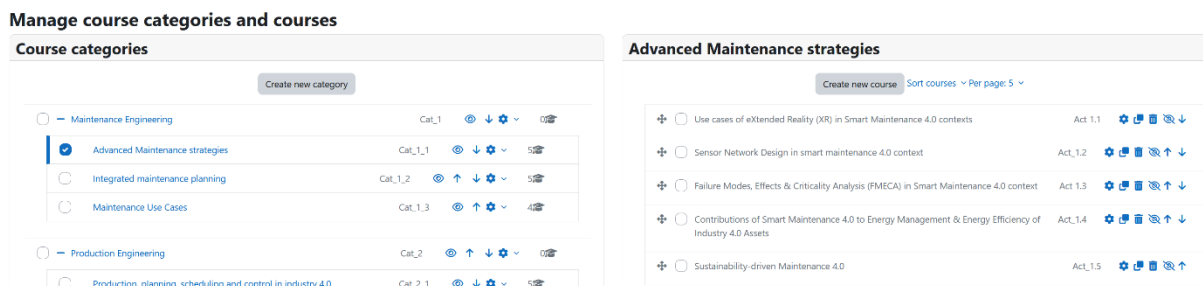


Figure 4: Organisation of training activities inside ENHANCE courses.

4. The LeL platform deployment

The LeL platform was deployed at two levels: the project Level with a master release, and the partners levels with copies to be adapted to their specific exploitation requirements.

4.1. At the ENHANCE project level

The ENHANCE project releases a main instance of the LeL platform gathering the 42 developed training activities. This platform is proposed to collect the training activities updates throughout the project lifetime and after. When needed, only the project partners are allowed to receive an export of the platform content, or a full copy of the platform. A guest account (with student access role) may be released to the Erasmus plus agency when it will be needed to control the existence of the training activities.

The main platform is accessible through the following addresses:

- <http://lel.univ-lyon2.fr>

- <http://lel.eplus-enhance.eu>

The 42 activities in the main platform are illustrated in Figure 5.

My courses

Course overview

All Search Sort by course name Card

<p>Big data and predictive inventory analytics Production, planning, scheduling ... Hidden from students</p>	<p>Contributions of Industry 4.0 technologies to ... Integrated maintenance planning Hidden from students</p>	<p>Contributions of Smart Maintenance 4.0 to ... Advanced Maintenance strategies Hidden from students</p>
<p>Data acquisition and storage in industry 4.0 Maintenance Use Cases Hidden from students</p>	<p>Data-driven for planning/scheduling models and ... Production, planning, scheduling ... Hidden from students</p>	<p>Data-driven inventory management Production Use Cases Hidden from students</p>
<p>Data-Driven Reliability for Smart Maintenance 4.0 Integrated maintenance planning Hidden from students</p>	<p>Design and development of smart Production ... Production, planning, scheduling ... Hidden from students</p>	<p>Design for X applied for Quality Advanced PSS Quality Design Hidden from students</p>
<p>Digital control systems (DCSs) Production Use Cases Hidden from students</p>	<p>Downtime forecast and optimal maintenance ... Integrated maintenance planning Hidden from students</p>	<p>Emerging uses of smart technologies for ... Production Use Cases Hidden from students</p>
<p>Failure Modes, Effects & Criticality Analysis ... Advanced Maintenance strategies Hidden from students</p>	<p>Horizontal and vertical integration & Workflow ... Production Use Cases Hidden from students</p>	<p>Industry 4.0 Asset & Maintenance Management ... Integrated maintenance planning Hidden from students</p>

Figure 5: Training activities presentation in the LeL platform

The main platform hosted at the ENHANCE project level is populated by the project consortium to upload the proposed training activities according to the Learning Framework Template. When validated, this platform is exported in Open Virtual Machine (OVA) format and shared with all the PC institutions for local deployment in their premises.

4.2. At the four partner countries levels

The LeL platform is deployed at the four partner countries to serve the eight training programmes addressed during the ENHANCE project and the three digital innovation hubs. These platforms are hosted by each university as detailed below:

Partners	Hosting details
IIT	URL: http://lel.iit.tn Details: The deployed platform is available to support the training activities related to the programme developed in the IIT institute as well as the training activities to be offered by the local digital innovation hub (Smartech).
UCAR	URL: http://lel.innotech-fsegn.org Details: The deployed platform is available to support the training activities related to both programmes developed in the FSEGN institute as well as the training activities to be offered by the local digital innovation hub (INNOTECH).
ECC	URL: https://lel.fecc.ma:8888/ Details: The deployed platform is available to support the training activities related to the programme developed in the ECC partner.
UIT	URL: https://dlc.uit.ac.ma/course/index.php?categoryid=572 Details: The deployed platform is available to support the training activities related to both programmes developed in the UIT - ENSAK institute as well as the training activities to be offered by the local digital innovation hub (COSINUS).

5. The LeL platform exploitation models

The exploitation of the LeL platform is aligned with the expectations of each partner country institution. The main objective of the ENHANCE project is to maximise the number of exploitation channels to increase the impact of the ENHANCE project.

5.1. IIT exploitation model

The LeL exploitation model at the IIT partner can be summarised in the following points:

- For trainers
 - Upskilling new lectures
- For students
 - To open access for UIT training programmes not addressed by the ENHANCE project
 - To improve the acquisition of the MPQ 4.0 concepts (related to some training activities in the programmes) in asynchronous way.
 - To support students in the acquisition of additional competences / skills for internal projects related to their tutored projects.
 - Get access to the project activities' datasets to apply the proposed concepts in their training activities.
 - To support catch-up sessions when students do not pass a training module.
- For PhD. Student
 - To share access with PhD students where the research project is related to the ENHANCE topics.
- For competence centres / DIHs

- To train industrial representatives.

5.2. UCAR exploitation model

The LeL exploitation model at the UCAR partner can be summarised in the following points:

- For trainers
 - Upskilling new lectures
- For students
 - To improve the acquisition of the MPQ 4.0 concepts (related to some training activities in the programmes) in asynchronous way
 - To support students in the acquisition of additional competences / skills for internal projects related to their tutored projects.
 - Get access to the project activities' datasets to apply the proposed concepts in their training activities.
 - To support catch-up sessions when students do not pass a training module.
- For competence centres / DIHs
 - To train industrial representatives.

5.3. ECC exploitation model

The LeL exploitation model at the ECC partner can be summarised in the following points:

- For trainers
 - Upskilling new lectures
- For students
 - To improve the acquisition of the MPQ 4.0 concepts (related to some training activities in the programmes) in asynchronous way
 - To support students in the acquisition of additional competences / skills for internal projects related to their tutored projects.
 - Get access to the project activities' datasets to apply the proposed concepts in their training activities.
 - To support catch-up sessions when students do not pass a training module.

5.4. UIT exploitation model

The LeL exploitation model at the UIT partner can be summarised in the following points:

- For trainers
 - Upskilling new lectures
- For students
 - To open access for UIT training programmes not addressed by the ENHANCE project
 - To improve the acquisition of the MPQ 4.0 concepts (related to some training activities in the programmes) in asynchronous way
 - To support students in the acquisition of additional competences / skills for internal projects related to their tutored projects.
 - Get access to the project activities' datasets to apply the proposed concepts in their training activities.
 - To support catch-up sessions when students do not pass a training module.
- For PhD. Student
 - To share access with PhD students where the research project is related to the ENHANCE topics
- For competence centres / DIHs

- To train industrial representatives.

6. Conclusion

The ENHANCE LeL platform represents the main container valorising and sustaining the outcomes of the ENHANCE project. The set of 42 training activities are uploaded and organised in the platform according to the Learning Framework reference frame. After validation, each PC deploys its own LeL platform and use it according to local exploitation model and related priorities.