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Building Skills 4.0 through University and Enterprise Collaboration

SHYFTE 4.0

WP5: WP Management

D5.3: Project periodic reports

vs:2.0.0

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This document is the summary of the periodic reports (for each reporting period) comprising a summary of the progress of work towards the objectives of the project, including achievements and attainment of any milestones and deliverables identified in the project plan. This report includes the differences between work expected to be carried out and that actually done, as well as explanation of the use of the resources and a financial statement from each partner.

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Further Information

http://www.shyfte.eu/

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Project Partners:

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1. Executive Summary

This document is the summary of the periodic reports (for each reporting period) comprising a summary of the progress of work towards the objectives of the project, including achievements and attainment of any milestones and deliverables identified in the project plan.

This report includes the differences between work expected to be carried out and that done, as well as explanation of the use of the resources and a Financial Statement from each partner

2. First periodic report

The project started in November 2018, after 18 months of the project, on July 22, 2020, the mid-term report was finalized and validated by the EACEA. In this report, the progress of the tasks, the first deliverables and the main key performance indicators were presented.

2.1 Project Organization

We organized the Shyfte 4.0 management structure in three mains pillars:

1. Project Coordinator, University Lumière Lyon 2 (ULL), for monitoring and centralizing the project progress by ensuring administrative and contractual ties to both consortium members and EC.

2. Project Management Board (PMB): The main role of the PMB is to control the management of the project (work plan, timetable, activities outcomes) and to verify that dissemination activities are performed well and via a documented process.

To monitor the project, we defined in the quality assurance system a QA Matrix and QA Performance Indicators table (see. Deliverable D5.1 section 9). For all the WPs, every task and activity have QA Indicators which are filled out by the tasks leaders: 28 indicators for WP1, 32 for WP2, 23 for WP3, 32 for WP4 and 11 for WP5.

The following are examples of specific project management indicators (WP5):

- WP5-T5.1: The assigned tasks start and finish on time
- WP5-T5.1: Number of deliverables finished on time
- WP5-T5.2: Number of QA procedures defined
- WP5-T5.2: Number of travel reports
- WP5-T5.2: Number of publications in international conferences
- ...

3. The Advisory Board is composed by the associated partners: Linde Home Care, KnowledgeBiz, Malaysians Communications and Multimedia Commission (MCMC), and Centre of Artificial Intelligence and Robotics (CAIRO). It is consulted for the validation of activities concerning the industrial sector. It will also help providing advice on how to enhance the impact of the project. A further aim of the project is to increase the number of associated partners (to include more industrial SMEs).

Regular consortium meetings (PMB) are scheduled every 2 or 3 months. In addition to the physical meetings of the consortium (Jan. 19, March 19, May 19, Oct. 19, Dec. 19, and Feb. 20) remote meetings are also regularly scheduled (July 19, March 20, Apr. 20, May 20, June 20)

The collaboration within the Shyfte consortium is implemented through a dedicated platform (OwnCloud), to share projects documents, including grant agreement, reporting, meeting minutes, training materials... and to facilitate the coordination of the project members. The structure of the collaboration platform is described in the D5.1 Project Handbook, Section 11.

So far we have not had to change the project management organization. We finalized on time the Partnership Agreements (PA) and the Grant Agreement between the partners:

- During the Kick-off-meeting in Lyon (Jan. 2019), ULL presented the PA to all partners. Following these exchanges, we decided to transfer the budgets to each partner, except for travel budget, because we had a rather reactive market in place in our university. All partners validated these rules and signed the PA on time
- The project monitoring was built around a common cloud space where all documents are made available to the partners. A mailing list has been created gathering all the participants as well as a mailing for the PMB and for the WP leaders
- An Excel file is available on the platform in which each partner can find:Gantt Chart, efforts, deliverables by tasks, work plan as well as future meetings and travel plan
- Meetings are planned several months in advance. At the end of each physical meeting, we decide the exact date of next meeting in agreement with all partners. This is to facilitate visa applications and internal organization. The agenda is sent 1 to 2 months in advance. We have also provided a template to harmonize the presentations, the agenda and minutes, as well as the different logos to be used

The partnership is stable, and the role of each partner were clearly defined during the project first phase, and have not changed since

2.2 Relevance to the objectives

In comparison to the original proposal, no change has affected the project relevance and added value for the partner countries involved. On the contrary, the widespread COVID-19 crisis that we are experiencing has reinforced the critical importance of the digitalization of society. Since the beginning of this crisis, both companies and individuals have been forced to make greater use of digital tools for communication and managing relations with their customers and suppliers. The rapid proliferation of the use of digital technologies is generating more and more data that are very useful for companies. However, companies will have to learn how to manage and exploit massive-scale data. More specifically, SMEs should be able to leverage the power of AI and big data techniques, to review their production management approaches, improve their products and services, strategic decisions making, gain competitive advantage, etc.

The targeted partner countries are faced with rapid radical changes in their industrial ecosystem, due to the high demand for upgrading their skills and competences. They need better learning and teaching methodologies to provide clear guidance on how to prepare the workforce for the industry of the future.

For all these reasons, the objectives of the project are all the more topical:

- To support academic and administrative staff in Asian HEIs to design and implement the new methodology and learning materials to enhance the competences and skills.
- To build and strengthen links between HEIs and Industry and promote the job market by minimizing the skill gap.

- To build Skills 4.0 Learning centers of excellence in Asian partner's HEI to enable them to become the reference center in their country and disseminate the results of the project nationally and regionally.
- In the first phase of the Shyfte project (months 1-18), several activities have been finalized and the first set of expected results have been achieved:
- Analysis of gap between the skills acquired in HEIs and the skills required by the industry of the future (D1.1) - Proposal of new Skills emerging model (D1.2)
- Development of Skills learning framework (D1.3)
- Design of teaching programs and learning materials for four domains of expertise (D1.4) - Organisation of Training of Trainers & Training of Students sessions (D1.4)
- Strategy for exploitation and dissemination mechanism (D4.1 & D4.2)

The other key tasks are in progress:

- Development of the four pilots is ongoing in the HEIs of the Asian partners (WP2 T2.1 to T2.4)
- Definition of quality assurance plan for the learning programs (quality audits) to ensure sustainability (WP3 T3.2 to T3.4)
- Implementation of exploitation and dissemination strategy (WP4 T4.2 to T4.4)
- Development of Skills 4.0 based Learning Center in each PC (WP2 T2.5)

These centers will enable the participants to gain an adequate level of expertise required to work in real-world industrial projects. The key objective is to build a new generation of experts who could successfully tackle the technological disruption fostered by the fourth industrial revolution. To that end, we aim not only to train regular students but also the corporate professionals to enhance their skills.

It is worth noting that we designed advanced approaches and materials for the participants of the learning. We are developing “out of the box” learning mechanisms to engineer the learning process in the most advanced manner so that the participants gain hard skills that fit the practical needs of companies, the soft skills, and meta- skills to demonstrate working ability.

All these activities aim to strengthen the relationship between HEIs and the wider economic environment by improving the quality of education.

2.3 EU Education, Cooperation & Development policies

To improve the employment opportunities for graduates and to meet the expectations of the industry of the future, the project is to provide a strategy for the development of emerging skills focusing on a number of areas: Industrial Engineering and Business Management, Software Engineering and Bigdata analysis, Wireless networks Analysis, and Artificial Intelligence.

New technological advances underline the need to challenge the higher education system. In order to meet the requirements of Industry 4.0, the project is being carried out jointly by HEIs and SMEs. During the first phase of the Shyfte project, we have increased interactions and exchanges with companies and academia in order of magnitude to subtly analyse the needs in terms of skills 4.0.

In order to promote the university-enterprise collaboration and the employment opportunities for graduates, we organised a number of workshops and seminars during the first phase of the project:

- A special session in the “The annual meeting of SME4.0 project”, Chiang Mai, 30-31 January 2019
- An industrial workshop in Northern Science and Technology Park, Chiang Mai (10 researchers from EU, 15 local researchers and 10 students, 3 start-ups and 1 company), 26 march 2019.
- Industrial visit, Hexa Ceram Co. Ltd., Chiang Mai, 27 march 2019
- International cultural week, Chengdu University, October 2019
- Industrial workshop “Industry 4.0 & Skills Development in Erasmus+ Projects”, Lisbon, 30 May 2019
- Special Session speaker, Int. conference on Industrial Engineering and Operations Management, Bangkok, 5-7 march 2019
- Industrial visit in Chengdu Dabo electric co. LTD, Chengdu, 29 October 2019
- Winter Meeting of Industrial Systems Engineering Professors, Lisbon, February 2020

Furthermore, we have analysed the Skills requirements and the gap between the existing curricula and the company’s needs:

- A survey of more than 300 companies was carried out.
- more than 40 companies were interviewed
- 67 papers literature referenced
- 26 curricula and programs studied
- 19 teaching/learning methods analysed
- 19 skill sets identified in the four domains
- 8 papers published in international conferences

We will increase the number of events, both at the local level (each partner university) and at the national level (each partner country), as soon as the training sessions start and the learning centres are set up (in particular, when they are inaugurated) and when traveling ban due to COVID-19 is lifted. The main objective is to ensure the sustainability of the Learning Center so that they continue to develop and offer new services after the end of the project. Another critical objective is to increase the involvement of the companies in developing innovative learning services and training their employees. The connected and collaborative effort would add huge value in terms of developing a new spectrum of knowledge required in real-world workspaces.

European HEIs have experience in setting up research and training projects on the theme of Industry 4.0; they will share the results of the Shyfte project by promoting new opportunities for collaboration with other HEIs and companies at national and international levels.

The staff, students, and employees trained in Skills 4.0 in the framework of the Learning Centers of excellence will be vectors of skills development at their respective universities and other universities in their country as well as in enterprises, especially SMEs. Dissemination of project

results will take place through the SMEs and will increase employability of graduates and in turn help transformation and digitalisation process for the enterprises.

2.4 Description of the implemented activities

In the first phase of the Shyfte project, the activities implemented are in line with the work programme and timetable defined at the beginning of the project. We have defined for each WP the tasks and sub-activities with specific deadlines. This timeline specifies the deliverable tasks execution and review phases. Partners are assigned to each WP and task. This allows each partner to be directly involved in the development of the project in collaboration with the others.

A number of activities have been completed and the first expected results have been produced (8 deliverables completed on time):

- WP1-T1.1: Literature review of Industry4.0 (D1.1, July 2019): 67 literature referred, 92% between 2016 & 2020, 26 curricula studied, 19 learning methods analysed...
- WP1-T1.2: Identify the skills requested by Industry (D1.1, July 2019): nearly 300 companies surveyed, 3 industrial workshops, 2 visits in industrial companies...
- WP1-T1.3: Analyse the skill gap (D1.2 , Nov. 2019): a “High” quality gap analysis is completed, 35 topics offered by PC HEIs curricula studied, an emerging skills model is proposed...
- WP1-T1.4: Develop the Skills 4.0 learning framework (D1.3, Nov. 2019): 19 skill sets are identified for the 4 domains, 80 modules defined...
- WP1-T1.5: Design teaching programmes and learning materials (D1.4, June 2020): A learning strategy defined per domain (4 pilots), 40 detailed syllabus, 30 trainers sessions scheduled, 34 students sessions scheduled (>300 students targeted), 33 potential trainers identified...
- WP3-T3.1: Strategic Quality Plan (D3.1, Nov. 2019): D3.1 provides criteria, tools and procedures for analysing the effectiveness of the teaching and learning model
- WP4-T4.1: Dissemination and exploitation strategy (D4.1, Feb. 2019): D4.1 defines the dissemination strategic plan for the three years of the project (internal and external communication).
- WP4-T4.2: Dissemination and exploitation - website (D4.2, March 2019): The first version of website was online in March 2019. We encountered a technical problem from May to July 2019, period during which it was not accessible (the server was hosted by our CDU partner). We solved the problem at the beginning of July 2019 by relocating the server to Lyon (ULL)
- WP5-T5.1: Project management coordination & Quality management (D5.1, March 2019): D5.1 relates to the project handbook and the quality assurance plan which was completed
- WP5-T5.2: Quality, Risk and Innovation management (D5.1, March 2019): D5.1 provides the quality assurance plan and the risks analysis and management.

For the continuation of the project, the following main activities will be accomplished (13 tasks):

- Implementation and development of the 4 pilots (31 modules are under development).

- Define a quality assurance plan for the learning programs (quality audits) to ensure the sustainability - Develop a Skills 4.0 based Learning Centre of Excellence in each PC
- Disseminate and communicate the results of the project to other HEIs and companies.

Due to the COVID-19 crisis, the project has been disrupted since Dec. 2019/Jan. 2020 with the closure of universities in China and subsequent containment orders affecting all partners in Europe and Asia. Two physical meetings had to be cancelled but were proceeded virtually. Due to the pandemic circumstances, some project tasks have been delayed:

- Finalization of the acquisition and installation of the equipment
- The development of the modules with the support of EU experts

The tentative training of trainers sessions are scheduled in Oct. 2020 (first sessions in Chengdu) and in Dec. 2020 in Malaysia. Due to the pandemic travel restrictions, we are in the process of organizing a remote implementation of these trainings

2.5 Quality Assurance

In the first months of the project, a Quality Assurance System was elaborated. Its objectives are to guarantee the quality of the project and to ensure that the expected results can be achieved. The QA System is described in the deliverable **D5.1 Handbook and Quality Plan**, section 9.

QA Committee is composed of the PMB and by the WP leaders. The committee periodically checks and analyses time and activities gaps. Periodic virtual or physical meetings are organised (at least one in a month) to monitor project activities. During the physical meetings (6 in 2019-20) a more complete and thorough control of project advancements (time, budget, etc) was carried out.

QA procedures are part of the QA System. They demonstrate the overall compliance of the project with the rules and regulations of the EACEA and the partners countries; and evaluate the effectiveness of project tasks, focusing on project results, outcomes and impact. They are based on qualitative data (meeting the specified deadlines, achievement of targets) and quantitative data (answers to questionnaires and reports). Data are gathered from project partners and key stakeholders (trainers, staffs, students, SME's...). QA Procedures are based on four pillars:

1. QA Matrix Table: description of the QA standards and the related documentation foreach WP

2. QA Performance Indicators Table: Main indicators are detailed in a table of KPI. Every task and activity has indicators which are filled out by the tasks leaders:

- **WP1: 28** indicators (7 for T1.1, 7 for T1.2, 4 for T1.3, 5 for T1.4, 5 for T1.5)
- **WP2: 32** indicators (8 for T2.1, 7 for T2.2, 7 for T2.3, 7 for T2.4, 3 for T2.5)
- **WP3: 23** indicators (7 for T3.1, 5 for T3.2, 8 for T3.3, 3 for T3.4)
- **WP4: 26** indicators (8 for T4.1, 7 for T4.2, 8 for T4.3, 3 for T4.4)
- **WP5: 11** indicators (4 for T5.1, 7 for T5.2)

These indicators are measured in the "Table of Achieved/Planned results"

3. QA Internal & External Evaluations: the project includes an internal and external evaluation approach to ensure: the correct achievement of project indicators, the quality of project activities

and events and the relevance of project results. The external evaluation is performed with the Associated Partners (Linde Home Care, KnowledgeBiz, Malaysians Comm. and Multimedia Commission, and Centre of Artificial Intelligence and Robotics. The evaluators were chosen based on their experience in the industry digitalisation. They have a role of adviser to the consortium on the strategic orientations of the project. They will make an overall assessment of the project as well as provide recommendations for continuance and sustainability, identify key lessons and propose suggestions for possible follow-up actions.

4. Quality Assurance - Risk Mgt Plan: The Risk Mgt plan describes the events and parameters that may generate potential risks in the implementation of the project. It also identifies the potential impact of risks and ways to mitigate them. The structure of this plan consists of a global overview on the risk management (10 major risks identified) and a more detailed description of the risks per WP/Task (4 Risks for WP1, 6 for WP2, 3 for WP3, 2 for WP2 and 1 for WP5)

During the first part of the project, we did not encounter any particular problems leading to the activation of the quality procedures. Unfortunately, the unforeseen COVID-19 crisis generates a major risk to the project. For the time being, we have been able to continue our activities remotely (two physical meetings have been cancelled and substituted by virtual ones). If the crisis continues, and possibility of travel restrictions imposed, we will have to be agile and adapt our procedures in order to manage remote training for the trainers and students.

2.6 Visibility

From the first months of the project, a website was developed to allow active communication around the project: www.shyfte.eu The website structure is detailed in the deliverable D4.2.

The homepage provides information and the latest project news; the menus provide access to the following pages:

- Project: Aims, Objectives, Organization, Schedule
- Partners
- Results: Deliverables & Publications • Learning Center (4 Pilots)
- News & events
- Contacts

Links to social networks are also provided on the website.

We encountered a technical problem from May 19 to July 19, period during which the website was not accessible (the server was hosted by our partner in China). We solved the problem in July 2019 by relocating the server to Lyon (ULL).

Today, all the partners communicate on the project through the common website. Thereafter, specific websites will be developed by the 6 partner universities (in English & in the local language) in order to present the Learning Centres, Skills emerging model and the modules developed for each domain. These websites will be aimed at universities and students in the PC as well as companies. Specific pages will present the impact of digitisation for companies, why a rise in skills is necessary and how this can promote the development of industrial SMEs

The communication of the project is based on 2 levels:

Internal Communication: a project information management tool has been set-up: https://disp-ds.univ- lyon2.fr/owncloud for team collaboration. All documents are stored on this cloud. It's an important tool to share also the outcomes and deliverables between the partners. Specific mailing lists, used only by subscribers, are used to ease communication (eg. the main mailing shyfte@shyfte.eu is used for all the members). Communication platforms (Teams/Zoom) are also used to provide a digital workspace to support the virtual communication between project members.

External Communication: Since the start of the project, the partners worked on a dissemination and exploitation plan with the following main objectives:

- Visibility: identify a set of entities where to make a presentation of the project
- Dissemination: identify the events where to communicate the results
- Make a dissemination map with locations and dates
- Exploitation: identify the industries where to present the Skills Learning centers.

This dissemination plan is detailed in the deliverable D4.1. It describes the dissemination opportunities identified through traditional communication channels such as events (conferences, seminars...), project publications (leaflets, press releases, conference papers, scientific journals...). Banners has been edited by some partners as China, Thailand and France, complemented also by online activities based around the website, and through the main social networks (Facebook, Linkedin...).

So far, we have organized 3 industrial workshops involving academics and companies, 2 visits to industrial companies and 4 seminars to present the project objectives and analyse the companies' needs. And we have presented 8 papers in Int. conf. to present the first results.

We will increase the number of events, both at the local level (each partner university) and at the national level (each partner country), as soon as the training sessions start and the Learning Centres are set up (for their inauguration). The main objective is to ensure that the Learning Centres continues to develop new services after the end of the project. And that companies become more and more involved in the development of these services and in the training of their employees.

2.7 Involvement of partners and stakeholders

The organization put in place allows each partner to play a specific role in the management and the development of the project. The local coordinators are involved in the Project Management Board, and one staff from each partner institution is leading the WPs and the Tasks.

The Work package Leaders manage their WP, in cooperation with Task Leaders within them. They may arrange technical meetings for their WP.

The WP and Tasks leaders have been designated at the project start as follows:

• WP1 is led by CMU-COGNITUS

. Task T1.1 is led by ULL

. Task T1.2 is led by UNS

. Task T1.3 is led by UNL

. Task T1.4 is led by UNL

. Task T1.5 is led by ULL

• WP2 is led by ULL-UPM

. Task T2.1 is led by CMU-KU

. Task T2.2 is led by CDU-CUIT
. Task T2.3 is led by UPM
. Task T2.4 is led by UTM
. Task T2.5 is led by UNL

• WP3 is led by CUIT-UNS

. Task T3.1 is led by UNS
. Task T3.2 is led by UNL
. Task T3.3 is led by CUIT
. Task T3.4 is led by CMU

• WP4 is led by UNL-CDU

. Task T4.1 is led by UNS
. Task T4.2 is led by CDU
. Task T4.3 is led by UNL
. Task T4.4 is led by ULL

• WP5 is led by ULL

. Task T5.1 is led by ULL
. Task T5.2 is led by UNS

The main objective of the Shyfte project is to develop 6 Learning Centers of Excellence in the PCs HEIs. These Learning Centers concern four main domains of skills for the industry of the future:

- The domain 1: Industrial Engineering and Management is leaded by CMU and KU.
- The domain 2: Software Engineering and Big Data Analysis is leaded by CDU and CUIT.
- The domain 3: Wireless Networks Analytics is leaded by UPM.
- The domain 4: Artificial Intelligence is leaded by UTM.

At this stage of the project, we have not yet strongly involved the public authorities of the partner countries, outside the governing bodies of our institutions. But we have started to work and communicate with companies and socio-economic organizations. For the analysis of skills needs and the gap with existing curricula, SMEs and industrial companies were involved in the development of the project (WP1). We organized three workshops and 2 visits in industrial companies in Thailand and China and nearly 300 companies have been surveyed in the Asian countries.

As example, one of the workshops in Chiang Mai addressed two different European projects:

- "**SME 4.0** – Smart Manufacturing and Logistics for SMEs in an X-to-order and Mass Customization Environment" (EU Horizon 2020 R&I programme) By Assoc.Prof.Dr. Sakgasem Ramingwong, CMU SME 4.0 representative
- "**MISE** - Curriculum Development of Master's Degree Program in Industrial Engineering for Thailand Sustainable Smart Industry (MSIE4.0)" (Erasmus+ KA2 project) By Assoc.Prof.Dr. Wichai Chattinawat, CMU MSIE Project Manager.

Another industrial workshop was organized in Northern Science and Technology Park in Chiang Mai (1 industrial SME, 3 start-ups and around 15 researchers from industrial & computer engineering joined the meeting). The main topic was: "Roles of Science and Technology Park to Promote University/Industry Collaboration" By Dr. Tanyanuparb Anantana

The objective of these workshops and industrial visits were to discuss different solutions and try to get new ideas or approaches to our Shyfte project.

All partners have made the necessary efforts to ensure the success of the first phase of the project and to prepare the next phase as well as possible.

As soon as the training of trainers sessions begin, we will increase our communication with our institutions and with other universities in partner countries.In the same way, we will start to disseminate information on the skills training modules to the partner companies of our institutions and to the local authorities.

2.8 First results

The training sessions was supposed to start in October 2020 for the trainers and in July 2021 for the students.

In the first phase of the Shyfte project, after a literature review on skills for Industry 4.0, we defined a conceptual learning framework and a Skill 4.0 model. Based on these results we designed the learning programs material for the four domains, and we proposed a learning strategy to deploy the four pilots in each of the partner countries' universities.

The design of the learning materials was primarily based on the two following concepts:

1. The learning framework: describing the "Skills Sets" and the "Modules" identified according to the level of the trainees

The number of **Skills set** defined per domain:

- Industrial Engineering Management: **7**
- Software Engineering and Big Data Analytics: **4**
- Wireless and Networks Analytics: **5**
- Artificial Intelligence: **3**

The number of **Modules** defined per domain **(79)**:

- **22** modules syllabus for IE domain
- **7** modules syllabus for Business Mgt domain
- **18** modules syllabus for SE& Bigdata domain
- **17** modules syllabus for Wireless domain - **15** modules syllabus for AI domain

2. The program of the modules integrating the main following concepts (40 syllabus described):

- Domain, Modules: title, description, keywords, outcomes, prerequisites; Teaching plan; Delivery method; Teaching materials; Equipment; Duration; Target group & level; Skill sets; Type of skills: hard, soft and meta skills; Assessment method

40 module syllabus were defined:

- **9** modules syllabus for IE domain
- **7** modules syllabus for Business Mgt domain
- **5** modules syllabus for SE& Bigdata domain
- **6** modules syllabus for Wireless domain
- **13** modules syllabus for AI domain

In the Learning Strategy to deploy the 4 pilots we have scheduled the Training of the Trainers (ToT) sessions & the Training of the Students (ToS) students. Below are the sessions that were scheduled for the mid-term report:

Training of the Trainers (ToT): From Oct. 2020 to April 2021

- **14** ToT sessions scheduled for domain 1
- **4** ToT sessions scheduled for domain 2
- **6** ToT sessions scheduled for domain 3
- **6** ToT sessions scheduled for domain 4
- **12** trainers identified for the domain 1 in Thailand (CMU & KU)
- **5** trainers identified for domain 2 in China (CDU & CUIT)
- **6** trainers identified for domain 3 in Malaysia (UTM & UPM)
- **10** trainers identified for domain 4 in Malaysia (UPM & UTM)

Training of the Students (ToS): From July 2021 to October 2021

- **14** ToS sessions scheduled for domain 1
- **4** ToS sessions scheduled for domain 2
- **6** ToS sessions scheduled for domain 3
- **10** ToS sessions scheduled for domain 4

The number of potential students trained:

- **100 to 120** students from CMU & KU
- **100 to 120** students from CDU& CUIT - 40 to 50 students from UPM& UTM
- **40 to 50** students from UTM& UPM

Due to the COVID-19 crisis, the project has been disrupted since Dec. 2019/Jan. 2020 with the closure of universities in China and subsequent containment orders affecting all partners in Europe and Asia. The tentative training of trainers' sessions was scheduled in Oct. 2020 (first sessions in Chengdu) and in Dec. 2020 in Malaysia. Due to the pandemic travel restrictions, we decided to organize a remote implementation of these trainings' sessions.

2.9 Impact and sustainability

The project was still ongoing; however, it was possible to affirm that this first part of the project development has been of considerable interest, involving many staffs and companies during the workshops and information seminars and raising awareness on the issues of developing Skills 4.0 Learning Centers in the PC universities.

The dissemination plan describes the opportunities identified through traditional communication channels such as event attendance (conferences, seminars, workshops), project publications (leaflets, press releases, conference papers), and project presentations to local stakeholders; complemented also by online activities through the main social platforms (Facebook, Linkedin...).

The dissemination activities have been designed to target the key audiences and stakeholders and to maximize awareness of Shyfte objectives and training activities. The dissemination and exploitation strategy are defined in the deliverable D4.1 completed on time (Feb. 2019). From the start of the project, dissemination was one of the important topics on project meetings (ideas,

suggestions and contributions). We have prepared templates, drafts of documents for external communication and project logo.

The main dissemination actions are as follows:

- ULL (France) developed a Kakemono and project banner for the project kick-off meeting in January 2019. CMU (Thailand), CDU & CUIT (China), UNS (Italy) and UNL (Portugal) did the same for publicity and communication on the project during the physical meetings in their countries
- Each partner prepared dissemination plan (min 3 activities on local and national level, and at least 2 on Int. level. These partners' dissemination plans were discussed and merged in the global Shyfte dissemination and exploitation plan (deliverable D4.1).
- We have developed the project web site since the start of the project: http://www.shyfte.eu, project Facebook profile: https://www.facebook.com/shyfteproject/ and Linkedin account. These website and social networks will be used more as soon as we start the training sessions. They will be useful to advertise the training sessions, make the learning centre known and to collect feedback and assessment from the trainees.
- From the first months of the project, a website was developed to allow active communication around the Shyfte project: www.shyfte.eu For the continuation of the project, specific websites will be developed by the 6 partner universities (in English and in the local language) in order to present the Learning Centers and the training sessions for students and companies.
- Each partner has dissemination table for monitoring and reporting about dissemination activities (type of event, participants etc.). This list is forwarded regularly to the WP4 Tasks leaders and this shows that the dissemination activities are very diverse, and are conducted on various levels (Deliverable D4.4)
- So far, we have organized 3 industrial workshops involving academics and industrialists, 2 visits to industrial companies and 4 seminars to present the project objectives and analyse the companies' needs in terms of skills, and we have published and presented 8 papers in Int. conferences to present the first results of the project.

We will increase the number of events, both at the local level (each partner university) and at the national level (each partner country), as soon as the training sessions start and the learning centres are set up (in particular, when they are inaugurated). The main objective is to ensure that the Learning Centres continue to develop and offer new services after the end of the project. And that companies become more and more involved in the development of these services and in the training of their employees.

3. Final Periodic Report

Horizontal Issues:

- The international pandemic did not allow us to continue in the same way the work initiated during the first part of the project (from Nov. 2018 to Jan. 2020). Physical meetings were no longer possible, which impacted and modified the way of managing the project (WP5), the organization of training sessions (WP2), the organization of dissemination events (WP4) ...
  - 7 physical meetings (out of 17) were cancelled due to the Covid-19 crisis.
  - A period of 2 months has been granted to fill the mid-term progress report due to Covid-19.
  - An extension of 10 months of the project was accepted by the EACEA, the new official end date of the project was 14 September 2022
- One of the partner's, the company Cognitus, contributed to all the WPs and tasks assigned to it. The collaboration was fruitful because of Cognitus' expertise in computer technologies, and in particular, artificial intelligence, deep learning, machine learning, big data... This was a bit more difficult during the containment period related to the Covid-19 crisis. Cognitus continued to work and collaborate with the project members. But the company was affected by the health crisis and was forced to stop its activity in the project in July 2021 and could not continue to collaborate during the 10-month extension period of the project. We informed our PO about the situation, and we explained that the absence of this partner during the end of the project would not have an impact on the efficiency of the project.

Previous recommendations/follow-up: The main recommendations of the mid-report were:

1. Concerning the table of planned/achieved results, it is expected a **clear indication of the status of the achievements compared to what was planned**.
   - The Quality Assurance Matrix (see Deliverables D5.2 and D5.3) presents the results and outcomes of the project, with the comparison with what was planned.
   - The Table of Achieved Results illustrates also the detailed results of the project
2. Therefore, the mid-term report should have not only mentioned the specific indicators of achievement, but also clearly specify if – and to what extent - they were actually met (or otherwise justify the impediment cause). This was not always clear in your current reporting formulation, e.g. concerning the Pilots or other ongoing (or even future) activities.
   - All the indicators of achievement are described in the Table of Achieved Results, most of them are fully achieved on the basis of what was planned.
   - Concerning the pilots, they are completed, the training sessions have been well done, both with the trainers and with the students. We trained 400 students (300 initially planned), and 214 trainers (60 initially planned). The Learning Centers have been developed and are operational. They could not be tested in the last student training sessions, due to the delay in the development due to the Covid-19 pandemic. Partners have been trained in the use and administration of the LCs and will be able to use them in future training sessions.

Relevance

3. In consideration of the current Covid-19 situation, we consider your project to be even more relevant compared to the original proposal. If successful implemented, the project will provide – with a Human-centered approach - skills and competencies to enable critical

thinking, creative problem solving and rapid innovation, by intervening on the educational system.

Quality of the project design and implementation

4. So far, the achieved results seem to lay on a solid basis, with a Gap Analysis having involved the Industry – and a consequent curricula coverage (skills model and framework) and creation of syllabus modules. On this point, **you are requested to specify the rate between new/refreshed modules vs. existing modules** – for each of the 4 finally proposed "domains" (study programmes) - and **to deliver a list of them with your Final Report**. In fact, **you are requested the make available to the Agency the deliverables of WP1 and 2**.
   - All the deliverables are available on the EACEA platform and on the Shyfte 4.0 project website (www.shyfte.eu)

5. The Quality assurance strategy, including the Risk Management provisions, contains relevant and measurable performance indicators, as well as adequate tools for monitoring the quality of the project implementation. In the original proposal an external evaluation was planned, while the **current implementation uses as external evaluators only the associated partners. This might hinder their independency, so you are expected to clarify this point.**

   - For the Quality Assessment of the outputs of the project we organized the evaluation at four levels:
   - Internal review: made by members of the project partners and the associated partners of the project (CAIRO…)
   - External review (1): was done by experts outside the project: professors from other faculties of the partners universities, professors from other universities, experts from companies.
   - External review (2): the training and learning materials developed during the project were evaluated by external reviewers (academic and corporate) through surveys
   - External review (3): we organized industrial workshops & seminars to share the results of the project with companies or academics, and we collect their evaluation and recommendations (discussion, surveys…)

6. Concerning the next phases of the implementation in these dire pandemic times, we praise your efforts of continuing and switching the activities to the online environment. Should the situation hinder the implementation of the project, please contact the Agency in due time with an updated Work plan offering alternative solutions for implementing the activities affected by Covid-19.

   - Because of the Covid-19 pandemic, we switched rapidly from face-to-face regular meetings to virtual meetings. We organized 44 virtual PMB or Plenary meetings from February 2020 to September 2022

Impact and dissemination

7. Concerning the impact of this project so far, we regret that little information was provided. We invite you to contact the Agency to better assess this criterion. Skills 4.0 Learning

centres would definitely prove the impact as concrete realizations, but the project is expected to have a wider impact on individuals, institutions and at the national level.

8. We noticed your strategy and efforts in disseminating the results by means of website and social media. To make them even more effective, we suggest you **to publish on the website the deliverables as soon as they are achieved** – and **to keep the website updated**: the latest news is dated February 2020

   - The website is updated, and all the deliverables are published online.

9. We remind you that the contribution of the project to the Partner Countries Universities and their participation shall **be visible on all Universities' website** – and we urge you to take action in this sense. This, in addition to the recognition of the support of the Programme on the Learning Centres websites.

   - All the partner's universities published articles related to the project on their websites. See the links on the Shyfte 4.0 website, in the section "Disemination/Shyfte in the Media": http://shyfte.eu/index.php/shyfte-in-media/

10. In addition, it seems that the **LinkedIn profile of the project is not properly working**. A good strategy could be to use Social media (Communication) to raise awareness on a specific event (e.g. a conference or a seminar – even if online); then the results (Dissemination) of it will well fit on the website.

    - Concerning the communication, we focused on the websites of the project, on the social network Facebook and the Youtube channels of the partners universities (to facilitate the dissemination in the partner's universities):

      - Facebook to communicate about the different events organized during the project: industrial workshops, seminars, training of the trainers, training of the students, meetings… we created a real dynamic around these events with more than 100 followers: https://www.facebook.com/shyfteproject/

      - We created recently a Youtube channel to disseminate the outcomes of the project: Learning Center Teaser, 4 Pilots teasers…

        https://www.youtube.com/channel/UCobTTukuj-qE-8uIHYM4NOg

      - Youtube channels of the partners universities to present videos of some events:

        See the links on the Shyfte 4.0 website, in the section "Disemination/Shyfte in the Media": http://shyfte.eu/index.php/shyfte-in-media/

11. In terms of Sustainability, the Skills 4.0 Learning centres of excellence will be useful, not only as "temporary" centres for results' dissemination – but also as permanent structures enabling continuous reflection and innovation. **At the Final Report stage, the project should be able to demonstrate how these Centres will be integrated in the Partners Universities structure, what will be their organization and the provisions (also**

financial) taken to ensure their future activities, and how they will continue ensuring the links with the industry.

- All the partners defined a Sustainability Assurance Plan to sustain the results of the project. For each Learning Center (Pilots), specific actions are organized to make the learning center continue to ensure the link with industry after the end of the project.

  The sustainability Assurance plan is described in the deliverable D3.3, and in the deliverable D5.2 (final report)

12. The Centres, and the other realisations of the project, **should be therefore able to attract support at the national/Institutional level, also beyond the life span of the project**.
    - The sustainability Assurance plan is described in the deliverable D3.3, and in the deliverable D5.2 (final report)

Transversal issues: The project proceeded in good conditions, the collaboration was perfect between the partners, each one having carried out the tasks and the coordination for which it was responsible. All tasks have been completed on time overall (considering the 10 months extension of the project).

The international pandemic did not allow us to continue in the same way the work initiated during the first part of the project (from Nov. 2018 to Jan. 2020). Physical meetings were no longer possible, which impacted and modified the way of managing the project (WP5), the organization of training sessions (WP2), the organization of dissemination events (WP4) ...

- 7 physical meetings (out of 17) were cancelled due to the Covid-19 crisis.

- A period of 2 months has been granted to fill the mid-term progress report due to Covid-19.

- An extension of 10 months of the project was accepted by the EACEA, the new official end date of the project was 14 September 2022

- One of the partner's, the company Cognitus, contributed to all the WPs and tasks assigned to it. The collaboration was fruitful because of Cognitus' expertise in computer technologies, and in particular, artificial intelligence, deep learning, machine learning, big data... This was a bit more difficult during the containment period related to the Covid-19 crisis. Cognitus continued to work and collaborate with the project members. But the company was affected by the health crisis and was forced to stop its activity in the project in July 2021 and could not continue to collaborate during the 10-month extension period of the project. We informed our PO about the situation, and we explained that the absence of this partner during the end of the project would not have an impact on the efficiency of the project.

3.1 Relevance of the results

In comparison to the original proposal, no change has affected the project relevance and added value for the partner countries involved. On the contrary, the widespread COVID-19 crisis that we experienced has reinforced the critical importance of the digitalization of society. Since the beginning of this crisis, both companies and individuals have been forced to make greater use of digital tools for communication and managing relations with their customers and suppliers. The rapid proliferation of the use of digital technologies is generating more and more data that are very useful for companies. However, companies will have to learn on how to manage and exploit massive-scale data. More specifically, SMEs should be able to leverage the power of AI and big

data techniques, to review their production management approaches, improve their products and services, strategic decisions making, gain competitive advantage, etc.

The targeted partner countries are still facing with rapid radical changes in their industrial ecosystem, due to the high demand for upgrading their skills and competences. They need better learning and teaching methodologies to provide clear guidance on how to prepare the workforce for the industry of the future.

For all these reasons, the objectives of the project are all the more topical:

- To support academic and administrative staff in Asian HEIs to design and implement the new methodology and learning materials to enhance the competences and skills.
- To build and strengthen links between HEIs and Industry and promote the job market by minimizing the skill gap.
- To build Skills 4.0 Learning centers of excellence in Asian partner's HEI to enable them to become the reference center in their country and disseminate the results of the project regionally and nationally.

In the first phase of the Shyfte project (months 1-18), several activities have been finalized and the first set of expected results have been achieved:

- Analysis of gap between the skills acquired in HEIs and the skills required by the industry of the future (D1.1) - Proposal of new Skills emerging model (D1.2)
- Development of Skills learning framework (D1.3)
- Design of teaching programs and learning materials for four domains of expertise (D1.4) - Organisation of Training of Trainers & Training of Students sessions (D1.4)
- Strategy for exploitation and dissemination mechanism (D4.1 & D4.2)

Since July 2020, and the validation of the mid-report by the EACEA, we continued the work on the different tasks, especially the development of the Pilots (WP2):

- Development of the four pilots is finished in the HEIs of the Asian partners (WP2 T2.1 to T2.4)
- Definition of quality assurance plan for the learning programs (quality audits) to ensure sustainability (WP3 T3.2 to T3.4)
- Implementation of exploitation and dissemination strategy (WP4 T4.2 to T4.4)
- Development of Skills 4.0 based Learning Center in each PC (WP2 T2.5)

All objectives have been met, but because of the Covid-19 pandemic, we needed an extension of 10 months to finalize the training of the trainers and the training of the students. We started the training of the trainers remotely, but we needed more time to organize face-to-face training sessions and use the equipment’s during the hands-on.

The development of the learning centers has also taken longer than originally planned, and we have had delays due to containment and remote work (which does not support collaborative work, although it does not prevent it).

Today the training centers are operational and can be used by partner universities. We just regret not having been able to finalize them early enough to test them during the last training sessions with the students.

Each partner university has already planned to use the Learning Centers in future training sessions, both with their students and in training sessions with companies. For this, dissemination campaigns will continue after the end of the project.

To sustain the Learning Centers and the learning materials (modules) developed during the project, the partners will make the link between the LC and the Lifelong platforms of their universities.

These Learning centers will enable the participants to gain an adequate level of expertise required to work in real-world industrial projects. The key objective is to build a new generation of experts who could successfully tackle the technological disruption fostered by the fourth industrial revolution. To that end, we aim not only to train regular students but also the corporate professionals to enhance their skills.

It is worth noting that we designed advanced approaches and materials for the participants of the learning. We are developing “out of the box” learning mechanisms to engineer the learning process in the most advanced manner so that the participants gain hard skills that fit the practical needs of companies, the soft skills, and meta- skills to demonstrate working ability.

All these activities aim to strengthen the relationship between HEIs and the wider economic environment by improving the quality of education.

3.2 Regional Cooperation

To improve the employment opportunities for graduates and to meet the expectations of the industry of the future, the project is to provide a strategy for the development of emerging skills focusing on four main areas: Industrial Engineering and Business Management, Software Engineering and Bigdata analysis, Wireless networks Analysis, and Artificial Intelligence.

New technological advances underline the need to challenge the higher education system. In order to meet the requirements of Industry 4.0, the project was carried out jointly by HEIs and SMEs. During the Shyfte project (mainly in the first phase), we have increased interactions and exchanges with companies and academia in order of magnitude to subtly analyse the needs in terms of skills 4.0.

In order to promote the university-enterprise collaboration and the employment opportunities for graduates, we organised a number of workshops and seminars during the project:

- A special session in the “The annual meeting of SME4.0 project”, Chiang Mai, 30-31 January 2019
- An industrial workshop in Northern Science and Technology Park, Chiang Mai (10 researchers from EU, 15 local researchers and 10 students, 3 start-ups and 1 company), 26 March 2019.
- Industrial visit, Hexa Ceram Co. Ltd., Chiang Mai, 27 March 2019
- International cultural week, Chengdu University, October 2019
- Industrial workshop “Industry 4.0 & Skills Development in Erasmus+ Projects”, Lisbon, 30 May 2019

- Special Session speaker, Int. conference on Industrial Engineering and Operations Management, Bangkok, 5-7 March 2019
- Industrial visit in Chengdu Dabo electric co. LTD, Chengdu, 29 October 2019
- Seminar GDR MACS (CNRS), Artificial Intelligence, the aim is to bring academics and industry practitioners and share research results and industry solutions, INSA Strasbourg, Nov. 2019
- Winter Meeting of Industrial Systems Engineering Professors, Lisbon, February 2020
- Seminar UTM Erasmus Day, Erasmus+ CBHE Projects Sharing Marathon, Kuala Lumpur, Malaysia, October 2020
- Seminar International Putra InnoCreative Carnival in Teaching and Learning, Putra, Malaysia, October 2020
- Shyfte Industrial Workshop: « Skills for the Industry of the future », webinar, Lyon, France, 03 March 2022
- Shyfte Industrial Workshop: « Skills for the Industry of the future », Lisbon, Portugal, 28 April 2022
- Shyfte Webinar: « Skill Development for Industry 4.0: An Innovation Perspective », Bangkok, Thailand, 06 May 2022
- Shyfte Industrial Workshop: « Learning Center: Skills for Industry 4.0 », Chiang Mai, Thailand, 31 August 2022

Furthermore, we have analysed the Skills requirements and the gap between the existing curricula and the company's needs:

- A survey of more than **300** companies was carried out.
- more than **40** companies were interviewed
- **67** papers literature referenced
- **26** curricula and programs studied
- **19** teaching/learning methods analysed
- **19** skill sets identified in the four domains
- **20** papers published in international conferences
- **7** papers published in international journals

Because of the pandemic situation, it was difficult for the consortium to increase the number of events, both at the local level (each partner university) and at the national level (each partner country), as soon as the training sessions started, and the learning centres were set up and when traveling ban due to COVID-19 was lifted. The main objective was to ensure the sustainability of the Learning Center so that they continue to develop and offer new services after the end of the project. Another critical objective is to increase the involvement of the companies in developing innovative learning services and training their employees. The connected and collaborative effort would add huge value in terms of developing a new spectrum of knowledge required in real-world workspaces.

The staff, students, and employees trained in Skills 4.0 (**214 trainers**, from universities and companies, and **400 students**) will be the first vectors of skills development at their respective universities and other universities in their country as well as in enterprises, especially SMEs. Dissemination of project results will take place through the SMEs and will increase employability of graduates and in turn help transformation and digitalisation process for the enterprises.

European HEIs have experience in setting up research and training projects on the theme of Industry 4.0; they will share the results of the Shyfte project by promoting new opportunities for collaboration with other HEIs and companies at national and international levels.

We started the collaboration with other universities involved in other European projects: H2020 SME4.0, Erasmus+ ETAT (https://etat-erasmus.com/) and ENHANCE (https://eplus-enhance.eu/). These projects are in the same thematic as the Shyfte project, and our ambition is to mutualize the results obtained in our different projects in order to promote the development of educational resources for universities and companies. For that, we organized working meetings with the teams of these projects.

3.3 Description of the implemented activities

At the end of the Shyfte project, we can say that the activities implemented are totally in line with the work program defined at the beginning of the project. The schedule was not fully respected, due to the Covid-19 pandemic, and the need to extend the project by 10 months to finalize the implementation of some tasks (training of students, visit of companies...). We have redefined the tasks and sub-activities with specific deadlines for each WP. This new timeline specifies the deliverable development and review phases. Partners have been assigned to each WP and to each task. This allowed each partner to be directly involved in the development of the project in collaboration with the others.

For the mid-report, a number of activities were completed, and the first expected results produced (**10 tasks, 8 deliverables completed on time**):

- WP1-T1.1: Literature review of Industry4.0 (D1.1, July 2019): **67** literature referred, **92%** between 2016 & 2020, **26** curricula studied, **19** learning methods analysed...
- WP1-T1.2: Identify the skills requested by Industry (D1.1, July 2019): nearly **300** companies surveyed, **3** industrial workshops, **2** visits in industrial companies...
- WP1-T1.3: Analyse the skill gap (D1.2 Nov. 2019): a “High” quality gap analysis is completed, 35 topics offered by PC HEIs curricula studied, an emerging skills model is proposed...
- WP1-T1.4: Develop the Skills 4.0 learning framework (D1.3, Nov. 2019): **19** skill sets are identified for the 4 domains, **80** modules defined...
- WP1-T1.5: Design teaching programmes and learning materials (D1.4, June 2020): A learning strategy defined per domain (4 pilots), **40** detailed syllabus, **30** trainers sessions scheduled, **34** students sessions scheduled (>300 students targeted), **33** potential trainers identified...
- WP3-T3.1: Strategic Quality Plan (D3.1, Nov. 2019): the deliverable D3.1 provides criteria, tools and procedures for analysing the effectiveness of the teaching and learning model

- WP4-T4.1: Dissemination and exploitation strategy (D4.1, Feb. 2019): the deliverable D4.1 defines the dissemination strategic plan for the three years of the project (internal and external communication).
- WP4-T4.2: Dissemination and exploitation - website (D4.2, March 2019): a first version of website was online in March 2019. We encountered a technical problem from May to July 2019, period during which it was not accessible (the server was hosted by our CDU partner). We solved the problem at the beginning of July 2019 by relocating the server to Lyon (ULL).
- WP5-T5.1: Project management coordination & Quality management (D5.1, March 2019): the deliverable D5.1 was completed, it relates to the project handbook and the quality assurance plan of the project.
- WP5-T5.2: Quality, Risk and Innovation management (D5.1, March 2019): the deliverable D5.1 provides the quality assurance plan and the risks analysis and management.

For the continuation of the project (from **July 2020** to **September 2022**), the following main activities were accomplished (**14 Tasks, 16 Deliverables completed on time**):

- WP2- T2.1 to T2.4 Implementation and development of the 4 pilots (D2.1 to D2.4)
- WP2- T2.5 Design and develop a Skills 4.0 Learning Centre in each PC (D2.5 to D2.7)
- WP3- T3.2 & T3.3 Define a Training Quality Plan (FQP) and a quality assurance plan for the learning programs (quality audits) (D3.2 & D3.3)
- WP3- T3.4 Define a Sustainability Assurance Plan (D3.3)
- WP4- T4.2 and T4.3 Insure awareness dissemination and acceptance of emerging skills4.0 and publicity around the project (D4.3 to D4.5)
- WP4- T4.4 and T4.5 Disseminate and communicate the results of the project to other HEIs and companies. Formal & informal meetings, Industrial workshops, seminars… and scientific dissemination (conferences and journal papers). (D4.6 & D4.7)
- WP5-T5.1 & T5.2: Project management coordination and reporting (D5.2) and Quality, Risk and Innovation Management (D5.3)

Due to the COVID-19 crisis, the project has been disrupted since January 2020 with the closure of universities in China and subsequent containment orders affecting all partners in Europe and Asia. Two physical meetings had to be cancelled but were proceeded virtually. Due to the pandemic circumstances, some project tasks have been delayed:

- Finalization of the acquisition and installation of the equipment
- The development of the modules with the support of EU experts

The tentative training of trainer's sessions was scheduled in Oct. 2020 (first sessions in Chengdu) and in Dec. 2020 in Malaysia. Due to the pandemic travel restrictions, we organized a remote implementation of these trainings. A new schedule of tasks was redefined and a request for a one-year extension was validated with the EACEA in 2021:

Co-funded by the Erasmus+ Programme of the European Union	Progress Report - Task Status	ID	RD-09
		Version:	Version 1.0
		Date:	09/12/2021
		Date of Report:	

Work Packages	Tasks	Title	Progress (%)	End Date (new)
Work Package 1	**WP1**		**100,00%**	
Work Package 1	T1.1	Literature review of Industry4.0 in Europe, Asia and over the world	100%	
Work Package 1	T1.2	Identify the skills requested by Industry4.0- Questionaries; workshop with Industry; relevant reports from EU commission	100%	
Work Package 1	T1.3	Analyse the gap by overlapping the skills4.0 with the existing skills in HEIs	100%	
Work Package 1	T1.4	Develop the Skills 4.0 learning framework - Identify the relationship between the skill4.0 and the SHYFTE 4 domains	100%	
Work Package 1	T1.5	Design teaching programs and learning materials for the 4 domains.	100%	
Work Package 2	**WP2**		**66,00%**	
Work Package 2	T2.1	Pilot in Domain1- Industrial engineering and management (Training materials)	70,00%	14/06/2022
		Improvement of the learning material with more hands-on (using the equipment) with industrial partners		30/04/2022
		Training sessions with the students (physically or on-line)		30/06/2022
Work Package 2	T2.2	Pilot in domain2 - Software Engineering and big data analysis (Training materials)	70,00%	14/06/2022
		Improvement of the learning material with more hands-on (using the equipment) with industrial partners		30/04/2022
		Training sessions with the students (physically or on-line)		30/07/2022
Work Package 2	T2.3.	Pilot in domain3 Wireless networks analytics (Training materials)	70,00%	14/06/2022
		Improvement of the learning material with more hands-on (using the equipment) with industrial partners		30/04/2022
		Training sessions with the students (physically or on-line)		30/07/2022
Work Package 2	T2.4	Pilot in Domain4 - Artifcial Intelligence (Training materials)	70,00%	14/06/2022
		Improvement of the learning material with more hands-on (using the equipment) with industrial partners		30/04/2022
		Training sessions with the students (physically or on-line)		30/07/2022
Work Package 2	T2.5	Develop the skills4.0 training and learning center	50,00%	14/09/2022
		Finalize the development of the Learning Center digital platform		30/03/2022
		Validation and testing with target audiences (students, industrial partners, etc.)		30/04/2022
Work Package 3	**WP3**		**45,00%**	
Work Package 3	T3.1	Strategic Quality Plan Quality plan to verify the effectiveness of the learning program	100,00%	
Work Package 3	T3.2	Formation Quality Plan (FQP)	40,00%	14/06/2022
		Train the Trainers on the Quality Management System according to ISO 9001		30/03/2022
Work Package 3	T3.3	Quality audits to analyse and evaluate the transfer of skills4.0 Measuring the impact of these skills in SME	20,00%	14/09/2022
		Audit of the learning materials and the training sessions		30/08/2022
Work Package 3	T3.4	Sustainability assurance plan	20,00%	14/09/2022
		Sustainability assurance Plan - Design the survey		30/03/2022
		Finalize the Sustainability Assurance plan(assess the KPI through the survey for the SME's)		30/08/2022
Work Package 4	**WP4**		**76,25%**	
Work Package 4	T4.1	Dissemination and exploitation strategy (Create strategic plan)	100,00%	
Work Package 4	T4.2	Awarness dissimination and acceptance of emerging skills4.0	80,00%	14/09/2022
		Organize one Industrial Workshop (On-line) - Skills for Industry 4.0		30/01/2022
		Organize one Industrial Workshop (On-line) - AI & Industry of the futur		30/03/2022
		Organize three Industrial Workshops (Physically or On-line) in each partner country		30/07/2022
Work Package 4	T4.3	Exploitation and dissemination for action (Web site, meetings, ...)	75,00%	14/10/2022
		Prepare communication videos on the project and its results, for each pilot		30/01/2022
		Inauguration of the Learning Centers in each partner country		30/04/2022
Work Package 4	T4.4	Scientific and technical dissemination (Conferences, workshops, seminars...)	50,00%	14/09/2022
		Organizing an International Conference in August 2022: SKIMA'22		30/08/2022
Work Package 5	**WP5**		**80,00%**	
Work Package 5	T5.1	Project management coordination and reporting	80,00%	14/09/2022
Work Package 5	T5.2	Quality, Risk and Innovation management	80,00%	14/09/2022

The results of the implemented activities are summarized in the following 5 categories (corresponding to the 5 WPs). The details of the activities are described in the corresponding deliverables; the details of the KPI's are described in the table of results achieved.

a. Gap Analysis

WP1. T1.1 - T1.3. Gap Analysis

- The number of literatures referenced: **67**
- The quality of the literature referenced is “High”:
  - 92% of the referenced articles have been published in recent years
  - referenced articles selected from tier-1 and tier-2 conferences & journals
  - referenced articles are taken from indexed and well-reputed research databases
  - mean value of total citations of literature referenced is: **78%**
  - number of curricula and programs studied: **26**
  - number of teaching/learning methods analyzed for the four domains: **14**
  - …

b. Learning Materials

WP2. T2.1 – T2.4 Learning Materials

For the four domains defined in the project, a total of **35 modules** have been developed.

Domain 1: Industrial Engineering and Business Management

- **6** modules developed for Industrial Engineering
- **5** modules developed for Business Management

Domain 2: Software Engineering and Big data analysis

- **5** Modules developed for SE & Bigdata analysis

Domain 3: Wireless networks analytics

- **7** Modules developed for wireless networks analytics

Domain 4: Artificial Intelligence

- **12** Modules developed for Artificial Intelligence

c. Training of Trainers Sessions

WP2. T2.1 – T2.4 Pilots development (1/2)

During the project, for the four domains, **37 Training of Trainers sessions** were organized.

They allowed the training of **214 trainers**.

- **Domain 1:** CMU 49 trainers; KU 25 trainers
- **Domain 2:** 31 trainers from CDU and CUIT
- **Domain 3:** UPM 56 trainers
- **Domain 4:** UTM 53 trainers

Among these trainers, **24 trainers from partner universities** have been trained.

Among these trainers, **20 persons from different companies** have been trained.

d. Training of Students Sessions

WP2. T2.1 – T2.4 Pilots development (2/2)

During the project, for the four domains, **28 Training of Students sessions** were organized. They allowed the training of **400** students.

. **Domain 1: 137** students from CMU and KU attended the different courses (94 CMU & 43 KU)

. **Domain 2: 144** students from CDU and CUIT attended the courses (120 CUIT & 24 CDU)

. Domain 3: 69 students from UPM attended the different courses

. **Domain 4: 50** students from UTM attended the different courses

e. Scientific events and publications

WP4. T4.4 Scientific Dissemination

During the 3 years of the project, 2019 to 2022, we presented our work in **20 international conferences.**

We organized a **special session in the international conference "IEEE – 15th China-Europe International Symposium on Software Engineering Education"** which was held in 2019 in Lisbon-Caparica, Portugal. This session focused on "Skills for Industry 4.0" and presented 5 papers.

We also published **7 papers in international scientific journals** to present the research work conducted in the Shyfte project.

f. Dissemination

WP4. T4.2 to T4.4 Dissemination

The main KPI's related to this dissemination are the following:

- Industrial workshops (face-to-face & virtual): **10** industrial & academics workshops
- Seminars (face-to-face & virtual): **5** dissemination seminars
- Industrial visits: **4** visits in companies in the 3 partners countries (Thailand, China & Malaysia)
- International Conferences (face-to-face & virtual): **20** papers presented in int. conferences
- Special session (face-to-face): **1** special session in an international conference
- Keynote Speaker (face-to-face): **1** keynote speaker invited
- Formal meetings (face-to-face): **10** Plenary and/or PMB meeting
- Informal meetings (virtual): **44** Plenary and/or PMB meeting

Through Shyfte's publicity channels, it was possible to disseminate the project to the target groups in the different partner countries in Asia and Europe. Publicity for the Shyfte project followed a specific dissemination strategy, including media outreach, website extension, promotional materials and launch ceremonies (during plenary meetings).

Concerning the communication, we focused on the websites of the project, on the social network Facebook and Youtube channels of the partners universities (to facilitate the dissemination in the partner's universities):

- Facebook to communicate about the different events organized during the project: industrial workshops, seminars, training of the trainers, training of the students, meetings… we created a real dynamic around these events with more than 100 followers: https://www.facebook.com/shyfteproject/
- We created recently a Youtube channel to disseminate the outcomes of the project: Learning Center Teaser, 4 Pilots teasers…

  https://www.youtube.com/channel/UCobTTukuj-qE-8uIHYM4NOg
- Youtube channels of the partners universities to present videos of some events:

  See the links on the Shyfte 4.0 website, in the section "Disemination/Shyfte in the Media": http://shyfte.eu/index.php/shyfte-in-media/

Promotional materials (e.g. kakemono, flyers...) have been created to promote the project and its results to target audiences.

In the same way as for the industrial & academic diffusion, the period of confinement linked to Covid-19 did not allow the multiplication of communication events, but we used all the communication channels to continue to communicate about the project.

The main KPI's are as follows:

- **13** publications in Shyfte in institutional websites
- **9** articles in medias (journal online and magazines, research exposition, news portals…)
- **5** promotional videos (youtube)
- **19** participations in seminars, workshops, exhibitions, fairs… (online or face-to-face)

Details of general dissemination are presented in ***deliverable D4.3 to D47*** *and on the Shyfte website:* ***www.shyfte.eu*** in the section ***Dissemination***

The final timeline of the tasks and deliverables is as following:

WP1	CMU & COGNITUS	DELIVERABLES	PREPARATION	Due date	New Due date (extension 10 months)	End date
T1.1	ULL	D1.1 v1	Literature review of Industry4.0 in Europe, Asia and over the world	14 May 2019		14 May 2019
			Literature review: Definition of Industry 4.0 + Analysis of existing concepts & models + Analyze of the current teaching and learning methods in EU & Asia (per domain)			
T1.2	UNS	D1.1 v2	Identify the skills requested by Industry4.0	14 May 2019		14 July 2019
			Define the maturity model and the framework of the questionnaire + validation + deployment + Summarize the survey			
T1.3	UNL	D1.2	Analyse the gap by overlapping the skills4.0 with the existing skills in HEIs. Develop an emerging model (emerging skills; disparate skills, shift skills,...)	14 November 2019		14 November 2019
			Analyse the gap by overlapping the skills4.0 with the existing skills in HEIs.+ Develop an emerging model: Refinement of Skill Model 4.0			
T1.4	UNL	D1.3	Develop the Skills 4.0 learning framework - Identify the relationship between the Skills & the SHYFTE 4 domains	14 November 2019		14 November 2019
			Develop the Skills 4.0 learning framework + Identify the relationship between the skill4.0 and the SHYFTE 4 domains			
T1.5	ULL	D1.4	Design teaching programs and learning materials for the 4 domains.	14 April 2020		14 June 2020
			Define the learning programs + the Syllabus of the modules to develop			

WP2	ULL & UPM		DEVELOPMENT (implementation of shyfte4.0 framework - Learning and training	Due date	New Due date (extension 10 months)	End date
T2.1	KU-CMU	D2.1	Pilot in Domain1- Industrial engineering and management (Training materials)	14 March 2021	14 September 2022	14 September 2022
			Learning Materials development: theoritical part, industrial use case, equipment used, infrastructure, material preparation... + Validation by the group of expert: Internal (1 or more expert per university partner) + External + Training of the trainer's sessions + earning Materials assessment & update + Student's maturity level assesment + Training of the students + Learning Materials assesment			
T2.2	CUIT-CDU	D2.2	Pilot in domain2 - Software Engineering and big data analysis (Training materials)	14 March 2021	14 September 2022	14 September 2022
			Learning Materials development: theoritical part, industrial use case, equipment used, infrastructure, material preparation... + Validation by the group of expert: Internal (1 or more expert per university partner) + External + Training of the trainer's sessions + earning Materials assessment & update + Student's maturity level assesment + Training of the students + Learning Materials assesment			
T2.3	UPM	D2.3	Pilot in domain3 Wireless networks analytics (Training materials)	14 March 2021	14 September 2022	14 September 2022
			Learning Materials development: theoritical part, industrial use case, equipment used, infrastructure, material preparation... + Validation by the group of expert: Internal (1 or more expert per university partner) + External + Training of the trainer's sessions + earning Materials assessment & update + Student's maturity level assesment + Training of the students + Learning Materials assesment			
T2.4	UTM-CUIT	D2.4	Pilot in Domain4 - Artifcial Intelligence (Training materials)	14 March 2021	14 September 2022	14 September 2022
			Learning Materials development: theoritical part, industrial use case, equipment used, infrastructure, material preparation... + Validation by the group of expert: Internal (1 or more expert per university partner) + External + Training of the trainer's sessions + earning Materials assessment & update + Student's maturity level assesment + Training of the students + Learning Materials assesment			
T2.5	UNL	D2.5	Develop the skills4.0 training and learning center	14 November 2021	14 September 2022	14 September 2022
			Define the protocol of operation and internal articulation of the Learning Center of Excellence,			
	UNL	D2.6	Learning Center as Innovation Lab.	14 June 2021	14 September 2022	14 September 2022
			Report the Lab set-up for applications developments and devices use and testing in prototypes.			
	UNL	D2.7	Develop the skills4.0 training and learning center	14 June 2021	14 September 2022	14 September 2022
			Report the methodology for the technical and business evaluation of innovative technological solutions			

WP3	CUIT &UNS		QUALITY PLAN	Due date	New Due date (extension 10 months)	End date
T3.1	UNS	D3.1 v1	Strategic Quality Plan Quality plan to verify the effectiveness of the learning program	14 November 2019		14 November 2019
			Validation of the learning program by the companies (advisory board) + Validation of the learning program by the academics + Define an evaluation questionnaire for the trainers & for the students			
T3.2	UNL	D3.1 v2	Formation Quality Plan (FQP)	14 June 2021	14 September 2022	14 September 2022
			Define the Formation Quality Plan and the quality indicators to evaluate the transfer of skills			
T3.3	CUIT	D3.2	Quality audits to analyse and evaluate the transfer of skills4.0 Measuring the impact of these skills in SME	14 July 2021	14 September 2022	14 September 2022
			Design a set of indicators to measure the potential impact of these skills in the SMEs			
T3.4	CMU	D3.3	Sustainability assurance plan	14 October 2021	14 September 2022	14 September 2022
			Design a sustainability plan to ensure the continuation beyond the end of the project.			

WP4	UNL & CDU		DISSEMINATION AND EXPLOITATION	Due date	New Due date (extension 10 months)	End date
T4.1	UNS	D4.1	Dissemination and exploitation strategy (Create strategic plan)	14 February 2019		14 February 2019
			Visibility: identify a set of public/private entities where to make a presentation of the project + Dissemination: identify the events where to communicate the results; dissemination meetings + Dissemination: identify the external universities where to propose the results of the project + Exploitation: identify the industries where to present the new professionals formed			
T4.3	UNL	D4.2	Project Website	29 March 2019		29 March 2019
			Develop Website prototype, first version, test, final version of the website			
T4.3	UNL	D4.3	Publicity	14 November 2020		14 November 2020
			Report on leaflets, press releases, etc. Participation in social networks			
T4.3	UNL	D4.4	Formal & informal meetings, conference days...	14 November 2021	14 October 2022	14 October 2022
			Report on formal and informal meetings, coffee type, workshops, days, etc.			
T4.2	CDU	D4.5 v1	Awarness dissimination and acceptance of emerging skills4.0	14 November 2019		14 November 2019
			Report on dissemination activities for action.			
T4.2	CDU	D4.5 vf	Awarness dissimination and acceptance of emerging skills4.0	14 November 2021	14 October 2022	14 October 2022
			Report on dissemination activities for action.			
T4.4	ULL	D4.6	Learning Centres and observatory exploitation.	14 June 2021	14 October 2022	14 October 2022
			Design and create what will be the network of centres and the Industry 4.0 observatory for the region.			
T4.4	ULL	D4.7	Scientific and technical dissemination (Conferences, workshops, seminars, ...)	14 November 2021	14 October 2022	14 October 2022
			Report on scientific dissemination: publication in indexed journals, participation in national and international conferences			

WP5	ULL		MANAGEMENT	Due date	New Due date (extension 10 months)	End date
T5.1 T5.2	ULL	D5.1	Project management coordination and reporting & Quality, Risk and Innovation management	29 March 2019		29 March 2019
			Project Handbook & Quality Plan			
T5.1	UNS	D5.3 v1-v3	Project management coordination and reporting	14 November 2021	14 October 2022	14 October 2022
			SHYFTE Periodic Reports			
T5.1	ULL	D5.2	Project management coordination and reporting	14 November 2021	14 October 2022	14 October 2022
			SHYFTE Final Report			

3.4 Quality Assurance Measures

In the first months of the project, a Quality Assurance (QA) System was elaborated. Its objectives were to guarantee the quality of the project and to ensure that the expected results can be achieved. The QA System is described in the deliverable **D5.1 Handbook and Quality Plan**, section 9.

The QA Committee is composed of the PMB and by the WP leaders. The committee periodically checks and analyses time and activities gaps. Periodic virtual or physical meetings are organised (at least one in a month) to monitor project activities. During the physical meetings **(10 from January 2019 to September 2022)** a more complete and thorough control of project advancements (time, budget, etc) was carried out.

QA procedures are part of the QA System. They demonstrate the overall compliance of the project with the rules and regulations of the EACEA and the partners countries; and evaluate the effectiveness of project tasks, focusing on project results, outcomes, and impact. They are based on qualitative data (meeting the specified deadlines, achievement of targets) and quantitative data (answers to questionnaires and reports). Data are gathered from project partners and key stakeholders (trainers, staffs, students, SME's...). QA Procedures are based on four pillars:

1. QA Matrix Table: description of the QA standards and the related documentation foreach WP

2. QA Performance Indicators Table: Main indicators are detailed in a table of KPI. Every task and activity have indicators which are filled out by the task's leaders:

- **WP1: 28** indicators (7 for T1.1, 7 for T1.2, 4 for T1.3, 5 for T1.4, 5 for T1.5)
- **WP2: 32** indicators (8 for T2.1, 7 for T2.2, 7 for T2.3, 7 for T2.4, 3 for T2.5)
- **WP3: 23** indicators (7 for T3.1, 5 for T3.2, 8 for T3.3, 3 for T3.4)
- **WP4: 26** indicators (8 for T4.1, 7 for T4.2, 8 for T4.3, 3 for T4.4)
- **WP5: 11** indicators (4 for T5.1, 7 for T5.2)

These indicators are measured in the "Table of Achieved results", they are summarized in the following table:

WP1/Task	Quality Assurance Indicator	Evaluation	Measurable Indicators
WP1 – T1.1	The quality of the literature review referenced • High relevance between the subject of the literature and project topic. • The referenced articles are peer reviewed • The referenced articles have been selected from tier-1 and tier-2 conferences and journals. • The referenced articles are taken from well reputed research databases - The curricula analyzed in the literature review - The teaching methods analyzed for the four domains in EU and in Asia - The learning method analyzed for the four domains - A study of knowledge and skill requirements	- Internal - Internal - External	1. Number of literatures referenced: **67** 2. **92%** of the referenced articles have been published in recent years 3. Mean value of total citations of literature referenced: **78%** 4. **26** curricula and programs studied 5. Number of teaching methods analyzed for the four domains in EU: **14** 6. Number of teaching methods analyzed for the four domains in Asia: **19** 7. Number of learning method analyzed for the four domains: **14**
WP1 – T1.2	- A questionnaire is developed in collaboration with industry - The number of SMEs surveyed in partners countries - The sectors and size of the SME's - The number of replies returned - Number of workshops - Quality of the reports studied/investigated - Maturity model defined successfully in collaboration between the industry and academic partners - A quality analysis is completed successfully - Quality of the recommendations based on this analysis	- External - External - Internal	8. Number of SMEs surveyed in partners countries: **295** 9. Number of small companies surveyed: **47** 10. Number of medium and big size companies surveyed: **218** 11. The global number of replies: **265** 12. Number of replies per partner country: • China: **87** • Malaysia: **86** • Thailand: **92** 13. Number of relevant reports studied/investigated: **8** 14. Number of workshops organized in PC country: **4**
WP1 – T1.3	- A quality gap analysis is completed successfully - Quality of the recommendations based on this analysis	- Internal - External	15. Number of topics offered by HEIs Asian curricula that correspond to Industry 4.0 required skills studied: **35** • **6** are vital for companies • **9** are of very high importance for companies

	- The curricula coverage according to the importance of the topics for companies - A high-quality skill model is developed. - The new skill model allows to quantify and qualify knowledge transference based on KPIs associated to the maturity in the 4 Shyfte domains.	- Internal - Internal - Internal	• **8** are of high importance for companies • **4** are not very important for companies • **7** are not important for companies • **1** has not yet been considered by companies 16. Curricula coverage according to the importance of the topics for companies: **12** • On 6 which are vital, **4** are covered • On 9 which are of very high importance, **3** are covered • On 8 which are of high importance, **3** are covered • On 4 which are not very important, **1** is covered • On the 8 last (not important, not yet been considered) **1** is covered 17. Number of recommendations based on the gap analysis: **12** 18. Number of publications: **7** publications in conferences for the WP1-T1 to T3
WP1 – T1.4	- The relationships between the skills and the Shyfte four domains are defined - The "required" skill set are identified - The "required" maturity levels of the trainees are identified - An efficient learning framework is defined - The modules' syllabus are defined	- Internal - External - Internal - Internal	19. Number of skills set per domain: • Industrial Engineering Management: **7** • Software Engineering and Big Data Analytics: **4** • Wireless and Networks Analytics: **5** • Artificial Intelligence: **3** 20. Number of modules defined per domain: • Industrial Engineering Management: **29** • Software Engineering and Big Data Analytics: **18** • Wireless and Networks Analytics: **17** • Artificial Intelligence: **15** 21. Numbers of generic/per sector modules 22. Number of modules' syllabus: • **9** modules syllabus defined for IE domain • **7** modules syllabus defined for Business Mgt domain • **5** modules syllabus defined for SE& Bigdata domain • **6** modules syllabus defined for Wireless domain • **13** modules syllabus defined for AI domain 23. Number of publications: **2** publications in conferences for the WP1-T4
WP1 – T1.5	- A learning strategy per domain is defined - The sessions for training of the trainers are scheduled - The sessions for training of the students are scheduled	- Internal - Internal - Internal	24. Number of detailed syllabus defined per domain • **16** detailed syllabus defined for domain 1 • **5** detailed syllabus defined for domain 2 • **6** detailed syllabus defined for domain 3 • **13** detailed syllabus defined for domain 4 25. Number of training sessions of the trainers scheduled

			• **14** ToT sessions scheduled for domain 1 • **4** ToT sessions scheduled for domain 2 • **6** ToT sessions scheduled for domain 3 • **6** ToT sessions scheduled for domain 4 26. Number of training sessions for the students are scheduled • **12** ToS sessions scheduled for domain 1 • **4** ToS sessions scheduled for domain 2 • **6** ToS sessions scheduled for domain 3 • **10** ToS sessions scheduled for domain 4 27. Number of potential trainers projected • **12** trainers identified for domain 1 • **5** trainers identified for domain 2 • **6** trainers identified for domain 3 • **10** trainers identified for domain 4 28. Number of potential students projected: **>300** • **100 to 120** students trained from CMU & KU (domain1) • **100 to 120** students trained from CDU& CUIT (domain2) • **40 to 50** students trained from UPM& UTM (domain3) • **40 to 50** students trained from UTM& UPM (domain4)

WP2/Task	Quality Assurance Indicator	Evaluation	Measurable Indicators
WP2 – T2.1	- The modules identified for the Industrial Engineering domain (based on the skills set and level of the trainees) - The modules identified for the Business Mgt domain (based on the skills set and level of the trainees) - The training session for the trainers occurred - The maturity level is defined for each category of students - The training session for the students occurred - Quality assessment of the training session - Analysis of the training quality questionnaire - One improvement plan per module is defined	- Internal - External - Internal - External - Internal - Internal	1. Number of modules developed for IE domain: **6** 2. Number of modules developed for Business Management domain: **5** 3. Number of trainers trained from CMU & KU: **111** 4. Number of staff per partner trained: **8** 5. Number of staff completing quality assessment: **75** 6. Number of students trained from CMU and from KU: **137** 7. Number of students completing quality assessment: **82** 8. Number of students satisfied: **93.45%** of the students are globally satisfied

	- All the modules are updated		
WP2 – T2.2	- The modules identified for Software Engineering and bigdata analytics domain (based on the skills set and level of the trainees) - The training session for the trainers occurred - The maturity level is defined for each category of students - The training session for the students occurred - Quality assessment of the training session - Analysis of the training quality questionnaire - One improvement plan per module is defined - All the modules are updated	- Internal - External - Internal - External - Internal - Internal	9. Number of modules developed for Software Engineering and bigdata analytics domain: **5** 10. Number of trainers trained from CDU & CUIT: **31** 11. Number of staff per partner trained: **5** 12. Number of staff completing quality assessment: **28** 13. Number of students trained from CDU and from CUIT: **142** 14. Number of students completing quality assessment: **92%** 15. Number of students satisfied: **91%** of the students are globally satisfied
WP2 – T2.3	- The modules identified for wireless and network analytics domain (based on the skills set and level of the trainees) - The training session for the trainers occurred - The maturity level is defined for each category of students - The training session for the students occurred - Quality assessment of the training session - Analysis of the training quality questionnaire - One improvement plan per module is defined - All the modules are updated	- Internal - External - Internal - External - Internal - Internal	16. Number of modules developed for wireless and network analytics domain: **7** 17. Number of trainers trained from UPM: **56** 18. Number of staff per partner trained: **3** 19. Number of staff completing quality assessment: **31** 20. Number of students trained from UPM: **69** 21. Number of students completing quality assessment: **72%** 22. Number of students satisfied: **92,5%**
WP2 – T2.4	- The modules identified for Artificial Intelligence domain (based on the skills set and level of the trainees) - The training session for the trainers occurred - The maturity level is defined for each category of students - The training session for the students occurred - Quality assessment of the training session - Analysis of the training quality questionnaire	- Internal - External - Internal - External - Internal	23. Number of modules identified for Artificial Intelligence domain: **12** 24. Number of trainers trained from UTM: **53** 25. Number of staff per partner trained: **13** 26. Number of staff completing quality assessment: **31** 27. Number of students trained from UTM: **50** 28. Number of students completing quality assessment: **73%** 29. Number of students satisfied: **95%** of the students are globally satisfied

	- One improvement plan per module is defined - All the modules are updated	- Internal	
WP2 – T2.5	- The architecture of the 4 learning centers is defined - the functionalities and main services are described (communication, identification, selection, registration, evaluation…). - The interactions between the global website and the local ones are identified - A dissemination strategy is proposed - A methodology for creation and testing is defined for the 4 Learning centers - A Business plan is defined for each Learning Center - A Knowledge-based framework is defined for each learning center - A methodology for technical and business evaluation is defined for the Learning centers	- Internal - Internal - Internal - Internal - External - External	30. Number of Skills 4.0 learning center implemented:**4** 31. Number of guidelines for teachers are defined (one per domain): **1** 32. Number of guidelines for students are defined (one per domain): **1**

WP3/Task	Quality Assurance Indicator	Evaluation	Measurable Indicators
WP3 – T3.1	- Validation of the learning program by the companies (advisory board, experts…) - Define an evaluation quality questionnaire for the trainers (per domain) - Define an evaluation quality questionnaire for the students (per domain)	- External - Internal - Internal	1. Number of professional experts per domain • Domain 1: **6** • Domain 2: **5** • Domain 3: **7** • Domain 4: **2** 2. Number of external academic experts per domain/HEIs: • Domain 1: **4** • Domain 2: **5** • Domain 3: **5** • Domain 4: **2** 3. Number of quality indicators defined: **14** 4. Number of questions per questionnaire: **22**

			5. Number of trainers filling the evaluation questionnaire: **165** 6. Number of students filling the evaluation questionnaire: **70%** (out of 400) 7. % of the students that are globally satisfied: **80%**
WP3 – T3.2	- Define a Training Quality Plan - Develop a Quality Management System (QMS) training session for trainers - Organize and Schedule quality audits to evaluate the skills 4.0 transfer and measuring the impact of these skills in SME's	- Internal - Internal - External	8. Number of indicators defined in the TQP per domain (pilot): • **22** questions to evaluate the training • **5** specific questions per domain (Pilot) • **4** specific questions for the trainers • **14** indicators of Skills 4.0 transfer 9. Number of trainers trained on QMS: **12** 10. Number of trainers satisfied by the QMS training: **88%** globally satisfied 11. Number of potential quality managers per Learning Centers: **4** in domain 1; **2** in domain 2; **3** in domain 3 and **3** in domain 4 12. Number of training quality audits scheduled per Learning Centers: **132** trainers trained during the ToT filled the quality questionnaires.
WP3 – T3.3	- Implementation of the Learning Centers audits - Evaluation of the Impact indicators - Assessment of the QMS system and continuous Improvement - Audits of SMEs in the Partners Countries with impact indicators conducted.	- Internal - External - External - External	13. Number of trainings of the trainer's quality audits carried out: **37** Training sessions were audited 14. Number of indicators of Skills 4.0 transfer: **14** 15. Number of Trainers certified: **214** 16. Number of non-conformities: **NA** (the audits did not reveal any real non-conformity) 17. Number of improvement actions defined: **1** improvement plan per module 18. Number of improvement actions implemented: **1** improvement plan implemented per module 19. Numbers of SME's involved **13** 20. Number of companies salaries audited: **7** trainees from companies filled the quality questionnaires
WP3 – T3.4	- A sustainability assurance plan is designed with the HEIs partners and SMEs. - A SME's survey is done to assess the Learning Centers indicators	- Internal - External - Internal	21. Number of companies globally satisfied by the Learning materials (per domain, per country): **82%** 22. Number of companies globally satisfied by the Learning Centers services (per domain, per country): **82%** 23. Number of SMEs that would recommend learning centers (per domain, per countries): **84%**

	- The sustainability plan ensures that the activities of the Learning Centers will continue beyond the end of the project.		

WP4/Task	Quality Assurance Indicator	Evaluation	Measurable Indicators
WP4 – T4.1	- Shyfte project dissemination to other universities - Shyfte project dissemination to companies	- External - External	1. Number of entities where the project was spread: • Domain 1: **22 entities in Thailand** • Domain 2: **12 entities in China** • Domain 3: **11 entities in Malaysia** • Domain 4: **8 entities in Malaysia** • 2. Number of external universities identified to disseminate the project • Domain 1: **18 universities in Thailand** • Domain 2: **6 universities in China** • Domain 3: **7 universities in Malaysia** • Domain 4: **6 universities in Malaysia** 3. Number of external industries identified to disseminate the project: • ToT sessions: **9** • Seminars & Workshops: **20** • Visits: **4** 4. Number of Shyfte proposed activities in universities: **5** seminars & exhibitions 5. Number of Shyfte proposed activities in industry: • **10** industrial workshops 6. Number of events where the project was spread: • **1** Keynote speaker in Int. conference • **1** Special session in Int. conference • **5** academic seminars • **10** industrial workshops • **7** papers in indexed int. journals 7. Number of conferences, formal, informal meetings…: • **20** international conferences • **10** physical Plenary or PMB meetings • **44** virtual Plenary or PMB meetings

			8. Number events/activity per partner in the Map: • France: **5** • Italy: **4** • Portugal: **3** • Thailand: **7** • China: **7** • Malaysia: **9**
WP4 – T4.2	- Awareness dissemination and acceptance of emergent skills - Development of a COST (European Cooperation in Science and Technology) proposal aligned with the dissemination of the Centers of Excellence;	- Internal - External	9. Number of awareness dissemination events: **47** 10. Number of partners involved: **37** other universities involved in the partners countries 11. Number of external entities involved: **33** 12. Number of Shyfte seminars & workshop: **20** 13. Number of partners: more than **60** external partners involved 14. COST proposal acceptance: Collaboration with **3 EU projects**: (1) Erasmus+ Enhance, (2) Erasmus+ ETAT, and H2020 SME 4.0 15. Number of initiatives argute to the COST: 3 seminars
WP4 – T4.3	- The Website is online - The Website is updated regularly - The events organized - Social Networks created and updated - Cluster of blogs indicators developed - Publication indicators - Conferences indicators	- External - Internal - External - External - Internal	16. Number of website visitors: **NA** (a technical problem did not allow us to measure the nb of visitors since the beginning of the project). 17. Average time on page: **NA** (a technical problem did not allow us to measure the nb of visitors since the beginning of the project). 18. Number of events organized: **30** seminars, workshops, visits, meetings… 19. Number of events (conference, seminars, workshops…) in which Shyfte partners participate: more than **80** events (conferences, seminars…) 20. Social networks number of follows: **106** followers on Facebook 21. Social networks number of likes: **98** likes on Facebook 22. Social networks number of shares Cluster of blogs indicators: **NA** (a technical problem did not allow us to measure the nb of visitors on the website since the beginning of the project). 23. Number of visitors: idem 24. Number of topics: around **18** topics covered 25. Number of posts: **35** posts published 26. Number of papers published Conferences indicators: **20** papers presented in int. conferences 27. Number of people: more than **600** people (average of 30 people per session) 28. Number of organizations: more than **300** organizations concerned

			29. Nb of Industrial companies: **NA** (difficult to measure the nb of companies involved in the int. conferences; especially online)
WP4 – T4.4	- Scientific and technical dissemination	- Internal - Internal - Internal	30. Number of papers in scientific conferences (per domain): • Domain 1: **4** conferences • Domain 2: **5** conferences • Domain 3: **4** conferences • Domain 4: **4** conferences 31. Number of publications in international scientific journals (per domain) • Domain 1: **2** journals • Domain 2: **3** journals • Domain 3: **1** journal • Domain 4: **2** journals 32. Number of workshops & seminars organized: **15**

WP5/Task	Quality Assurance Indicator	Evaluation	Measurable Indicators
WP5 – T5.1	- The assigned tasks start and finish on time - The project Handbook is defined and validated - The project meetings are scheduled - The minutes of the meetings are validated - The deliverables are finished & validated on time - The periodic reports are done on time - The final report is ready on time	- Internal - Internal - Internal - Internal - Internal	1. The number of physical meetings: **10** 2. The number of virtual meetings: **44** **3.** The duration of each task is respected: **All** tasks have been completed on time overall (considering the 10 months extension of the project). 4. Number of deliverables finished on time: **24** deliverables are delivered on time
WP5 – T5.2	- The Quality Assurance Plan is validated - The Quality Assurance Procedures are defined - A work plan with clear division of tasks and responsibilities between partners and timetable is produced - Conflicts are identified and resolved by the partners - Monitoring of the innovation being developed through the project	- External - Internal - Internal - Internal - External	**Quality Evaluation system** indicators: 5. Number of QA procedures defined: **4** main processes/procedures defined (registration, maturity level, training program, evaluation) 6. Number of PMB reports: **14** 7. Number of travel reports: **113** 8. Number of Timesheets produced (per person, per category): **125** 9. Number of conflicts solved: **1** 10. Number of publications in international conferences: **20** 11. Number of international journals submitted: **7** accepted + **2** submitted

QA Internal & External Evaluations: the project includes an internal and external evaluation approach to ensure: the correct achievement of project indicators, the quality of project activities and events and the relevance of project results.

To assess the progress of the project and the quality of the results, we organized the evaluation along the following four dimensions:

- Internal review: made by members of the project partners and the associated partners of the project (CAIRO, KnowledgeBiz, Malaysians Comm. and Multimedia Commission, Lindé Home Care …)
- External review (1): was done by experts outside the project: professors from other faculties of the partners universities, professors from other universities, experts from companies.
- External review (2): the training and learning materials developed during the project were evaluated by external reviewers (academic and corporate) through surveys
- External review (3): we organized industrial workshops & seminars to share the results of the project with companies or academics, and we collect their evaluation and recommendations (interviews, surveys…)

The evaluators were chosen based on their experience in the industry digitalisation. They have a role of adviser to the consortium on the strategic orientations of the project. They made an overall assessment of the project as well as provided recommendations for continuance and sustainability, identified key lessons and proposed suggestions for possible follow-up actions.

Quality Assurance - Risk Mgt Plan: The Risk Mgt plan describes the events and parameters that may generate potential risks in the implementation of the project. It also identifies the potential impact of risks and ways to mitigate them. The structure of this plan consists of a global overview on the risk management (10 major risks identified) and a more detailed description of the risks per WP/Task (4 Risks for WP1, 6 for WP2, 3 for WP3, 2 for WP2 and 1 for WP5)

During the first part of the project, we did not encounter any problems leading to the activation of the quality procedures. Unfortunately, the unforeseen COVID-19 crisis generates a major risk to the project. For the time being, we have been able to continue our activities remotely **44 virtual meetings were held.** We had to be agile and to adapt our procedures to manage remote training for the trainers and students.

3.5 Equipment

We have refined the analysis of the equipment requirements for the implementation of Skills Learning Centers. This has led to a request for minor changes to the equipment list in Nov. 2019. This request was made to EACEA and validated by our PO in Dec. 2019.

From this date, the partners started the process of equipment acquisition (selection of suppliers, establishment of quotations (at least 3), choice of suppliers...).

Due to the COVID-19, the project has been disrupted; PC partners informed us that there will be delays in finalizing the purchase of their equipment. Despite this, the partners have made efforts and today more than 70% of the equipment has been

purchased. The objective was to finalise the purchase and installation before the start of the academic year (Sept. 20).

The equipment was used by the 6 PC to develop the Skills 4.0 Pilots. A detailed presentation of the use of the equipment in the different modules is described by each partner in the **deliverables D2.1 to D2.4 (Pilots 1 to 4 development).**

- **CHINA**

- CHENGDU UNIVERSITY (CDU): budget used 18056€ out of the 20000€

- CHENGDU UNIVERSITY OF INFORMATION TECHNOLOGY (CUIT): budget used 20115€ out of the 20000€ .

PARTNERS	INVOICE DATE	PRICE PARTNERS CURRENCY	PRICE IN EUROS	INVENTORY	UE LABEL	EQUIPMENT PURCHASED
CDU-Chengdu University - Total used	11/05/2020	14514.56 CNY	1 835,82 €	YES	YES	Digital computer workstation - Alienwarem 15
	11/05/2020	10247.58 CNY	1 296,13 €	YES	YES	Digital computer workstation - Thinkpad Carbon 2019
	11/05/2020	10436.90 CNY	1 320,07 €	YES	YES	Digital computer workstation - Yoga C940
	11/05/2020	9757.28 CNY	1 234,11 €	YES	YES	Digital computer workstation- Thinkpad T490
	10/06/2020	10000 CNY	1 264,81 €	YES	YES	General Equipment-AVA Recording and Broadcasting Host, AE-E3SU
	10/06/2020	10000 CNY	1 264,81 €	YES	YES	General Equipment-AVA Recording and Broadcasting Host, AE-E3SU
	10/06/2020	10000 CNY	1 264,81 €	YES	YES	General Equipment-AVA Recording and Broadcasting Host, AE-E3SU
	10/06/2020	10000 CNY	1 264,81 €	YES	YES	General Equipment-AVA Recording and Broadcasting Host, AE-E3SU
	10/06/2020	8757.28 CNY	1 107,63 €	YES	YES	Software AVA Electronic camera V1.0/ V3.0
	10/06/2020	1165,05 CNY	147,36 €	YES	YES	Recording panel , KP-5A
	10/06/2020	1941,75 CNY	245,59 €	YES	YES	HD Camera, AX-E16PT
	10/06/2020	970,87 CNY	122,80 €	YES	YES	Polar microphone- AT- 880
	03/07/2020	5575,22 CNY	705,16 €	YES	YES	Peripheral equipment*Data acquisition portrait scanning professional HD camera-YJ-v3000
	03/07/2020	32743,36 CNY	4 141,43 €	YES	YES	Peripheral equipment GPU-TESLAP 100
	03/07/2020	5530,97 CNY	699,56 €	YES	YES	*Peripheral equipment* Data acquisition portrait scanning professional HD camera-YJ-v2000
CUIT-Chengdu Univeristy of Information and Technology	20/05/2020	37080.00 CNY	4 689,93 €	YES	YES	Computer products mobile, Mobile workstation RTX2060
	24/05/2020	9019.98 CNY	1 140,86 €	YES	YES	Software Ava EPTZ Application Software
	24/05/2020	9708.74 CNY	1 227,97 €	YES	YES	General Equipment AVA Recording Host, AE-E3SU
	24/05/2020	9708.74 CNY	1 227,97 €	YES	YES	General Equipment AVA Recording Host, AE-E3SU
	24/05/2020	9708.74 CNY	1 227,97 €	YES	YES	General Equipment AVA Recording Host, AE-E3SU
	24/05/2020	4763.80 CNY	602,53 €	YES	YES	General Equipment AVA Recording Host, AE-E3SU
	24/05/2020	2000.02 CNY	252,96 €	YES	YES	Software HD Camera Management Software
	24/05/2020	1000.01 CNY	126,48 €	YES	YES	Other Special Equipment - Directional Pick up Microphone- AT880
	02/06/2020	43241.58 CNY	5 469,25 €	YES	YES	Computer products, Graphic Workstation -T7920
	05/06/2020	12747.52 CNY	1 612,32 €	YES	YES	Computer Peripherals, Digital Display Terminal - Epson CB-2255U
	05/06/2020	2855.45 CNY	361,16 €	YES	YES	Computer Peripherals, Blanck and White Laser Output Terminal- HP m22fdw
	24/05/2020	5700.00 CNY	720,94 €	YES	YES	Other Equipment, HD Camera- AX-E16PT
	24/05/2020	5599.98 CNY	708,29 €	YES	YES	Other Equipment, HD Camera- AX-E16PS
	24/05/2020	1199.96 CNY	151,77 €	YES	YES	Other Special Equipment, Recording Panel, KP-5A

- **THAILAND**

- CHIANG MAI UNIVERSITY(CMU): budget used 17963€ out of the 20000€

- KASETSART UNIVERSITY(KU): budget used 12582€ out of the 20000€

PARTNERS	INVOICE DATE	PRICE PARTNERS CURRENCY	PRICE IN EUROS	INVENTORY	UE LABEL	EQUIPMENT PURCHASED
CDU-Chengdu University - Total used	11/05/2020	14514.56 CNY	1 835,82 €	YES	YES	Digital computer workstation - Alienwarem 15
	11/05/2020	10247.58 CNY	1 296,13 €	YES	YES	Digital computer workstation - Thinkpad Carbon 2019
	11/05/2020	10436.90 CNY	1 320,07 €	YES	YES	Digital computer workstation - Yoga C940
	11/05/2020	9757.28 CNY	1 234,11 €	YES	YES	Digital computer workstation- Thinkpad T490
	10/06/2020	10000 CNY	1 264,81 €	YES	YES	General Equipment-AVA Recording and Broadcasting Host, AE-E3SU
	10/06/2020	10000 CNY	1 264,81 €	YES	YES	General Equipment-AVA Recording and Broadcasting Host, AE-E3SU
	10/06/2020	10000 CNY	1 264,81 €	YES	YES	General Equipment-AVA Recording and Broadcasting Host, AE-E3SU
	10/06/2020	10000 CNY	1 264,81 €	YES	YES	General Equipment-AVA Recording and Broadcasting Host, AE-E3SU
	10/06/2020	8757.28 CNY	1 107,63 €	YES	YES	Software AVA Electronic camera V1.0/ V3.0
	10/06/2020	1165,05 CNY	147,36 €	YES	YES	Recording panel , KP-5A
	10/06/2020	1941,75 CNY	245,59 €	YES	YES	HD Camera, AX-E16PT
	10/06/2020	970,87 CNY	122,80 €	YES	YES	Polar microphone- AT- 880
	03/07/2020	5575,22 CNY	705,16 €	YES	YES	Peripheral equipment*Data acquisition portrait scanning professional HD camera-YJ-v3000
	03/07/2020	32743,36 CNY	4 141,43 €	YES	YES	Peripheral equipment GPU-TESLAP 100
	03/07/2020	5530,97 CNY	699,56 €	YES	YES	*Peripheral equipment* Data acquisition portrait scanning professional HD camera-YJ-v2000
CUIT-Chengdu Univeristy of Information and Technology	20/05/2020	37080.00 CNY	4 689,93 €	YES	YES	Computer products mobile, Mobile workstation RTX2060
	24/05/2020	9019.98 CNY	1 140,86 €	YES	YES	Software Ava EPTZ Application Software
	24/05/2020	9708.74 CNY	1 227,97 €	YES	YES	General Equipment AVA Recording Host, AE-E3SU
	24/05/2020	9708.74 CNY	1 227,97 €	YES	YES	General Equipment AVA Recording Host, AE-E3SU
	24/05/2020	9708.74 CNY	1 227,97 €	YES	YES	General Equipment AVA Recording Host, AE-E3SU
	24/05/2020	4763.80 CNY	602,53 €	YES	YES	General Equipment AVA Recording Host, AE-E3SU
	24/05/2020	2000.02 CNY	252,96 €	YES	YES	Software HD Camera Management Software
	24/05/2020	1000.01 CNY	126,48 €	YES	YES	Other Special Equipment - Directional Pick up Microphone- AT880
	02/06/2020	43241.58 CNY	5 469,25 €	YES	YES	Computer products, Graphic Workstation -T7920
	05/06/2020	12747.52 CNY	1 612,32 €	YES	YES	Computer Peripherals, Digital Display Terminal - Epson CB-2255U
	05/06/2020	2855.45 CNY	361,16 €	YES	YES	Computer Peripherals, Blanck and White Laser Output Terminal- HP m22fdw
	24/05/2020	5700.00 CNY	720,94 €	YES	YES	Other Equipment, HD Camera- AX-E16PT
	24/05/2020	5599.98 CNY	708,29 €	YES	YES	Other Equipment, HD Camera- AX-E16PS
	24/05/2020	1199.96 CNY	151,77 €	YES	YES	Other Special Equipment, Recording Panel, KP-5A

- **MALAYSIA**

- UNIVERSITY PUTRA MALAYSIA(UPM): budget used 15676€ out of the 20000€

- UNIVERSITY TEKNOLOGI MALAYSIA(UTM): budget used 10444€ out of the 20000€

PARTNERS	INVOICE DATE	PRICE PARTNERS CURRENCY	PRICE IN EUROS	INVENTORY	UE LABEL	EQUIPMENT PURCHASED
UPM-University Putra Malaysia	16/10/2019	2540 RM	533,89 €	YES	YES	MATLAB,
	16/10/2019	2540 RM	533,89 €	YES	YES	Simulink
	16/10/2019	2540 RM	533,89 €	YES	YES	5G Toolbox
	16/10/2019	1020 RM	214,40 €	YES	YES	Communications tool box
	16/10/2019	1020 RM	214,40 €	YES	YES	DSP system toolbox
	16/10/2019	1020 RM	214,40 €	YES	YES	Signal processing toolbox
	18/10/2019	18897 RM	3 972,04 €	YES	YES	3 DELL DESTOCK (Monitor,Windows 10, processor, Hard drive, RAM, Video card, Wireless, Accessories)
	17/06/2020	19980 RM	4 199,68 €	YES	YES	DELL DESTOK (Monitor, Windows 10, Dell Warranty, RAM 16GB, Video Card, Wireless, Bluetooth 5, Dell wireless keyboard and Mouse)
	26/08/2019	2650 RM	557,01 €	YES	YES	STM32 LORA DISCOVERY KIT
	26/08/2019	13 750 RM	2 890,17 €	YES	YES	KERLINK WIRNET STATION 923MHz (OUTDOOR LORAWAN GATEWAY) - with external enclosure - omnidirectional antenna 6dBi - 5 years warranty
	26/08/2019	3400 RM	714,66 €	YES	YES	KERLINK WIRNET IFEMTOCELL 923MHz (INDOOR LORAWAN GATEWAY)
	17/06/2020	2650 RM	557,01 €	YES	YES	STM32 LORA DISCOVERY KIT
UTM-Universiti Teknologi Malaysia	18/05/2020	38 720 RM	8 138,73 €	YES	YES	4-Mobile Workstation
	18/05/2020	5184 RM	1 089,65 €	YES	YES	8 Jetson Nano Developer Kit
	18/05/2020	2520 RM	529,69 €	YES	YES	8 Monitor HDMI port
	18/05/2020	384 RM	80,71 €	YES	YES	8 TP Link 300Mbps Wireless N USB Adapter
	18/05/2020	280 RM	58,85 €	YES	YES	8 Logitech keyboard K120 USB
	18/05/2020	200 RM	42,04 €	YES	YES	8 USB Mouse
	18/05/2020	120 RM	25,22 €	YES	YES	8 Tiny Tech RJ45-CAT5 Cable 2M
	18/05/2020	256 RM	53,91 €	YES	YES	8 Cards 32 GB UHS
	18/05/2020	240 RM	50,45 €	YES	YES	8 Power Supply
	18/05/2020	1327 RM	278,93 €	YES	YES	1 HP Laserjet M203DW
	06/07/2021	32 144 RM	6 756,49 €	YES	YES	Deep Learning Computer Component (invoice detailled)
	07/07/2021	7701 RM	1 618,70 €	YES	YES	Supply And Delivery For Hugh Performance Computer (Invoice detailled)

3.6 Sub contracting

The initial budget concerning the sub-contracting was as following:

Name of Partner (to encode in overview sheet)	Country (to encode in overview sheet)	Nature, type and specifications of the item	Amount Excluding VAT (EUR)
University Lyon2 ULL	France	Printing of project publications: Industry 4.0 analysis, Skills 4.0 Glossary & recommendation	1 000,00
University Lyon2 ULL	France	Financial audit	4 000,00
Chiang Mai University	Thailand	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	1 000,00
Chiang Mai University	Thailand	Skills4.0 Local Website design & maintenence	2 000,00
Chiang Mai University	Thailand	Certification	2 000,00
Kasetsart University	Thailand	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	1 000,00
Kasetsart University	Thailand	Skills4.0 Local Website design & maintanence	2 000,00
Kasetsart University	Thailand	Certification	2 000,00
Chengdu University of Information Technology	China	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	1 000,00
Chengdu University of Information Technology	China	Skills4.0 Local Website design & maintanence	2 000,00
Chengdu University of Information Technology	China	Certification	2 000,00
Chengdu University	China	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	1 000,00
Chengdu University	China	Skills4.0 Local Website design & maintanence	2 000,00
Chengdu University	China	Certification	2 000,00
University Putra Malaysia	Malaysia	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	500,00
University Putra Malaysia	Malaysia	Skills4.0 Local Website design & maintanence	1 500,00
University Putra Malaysia	Malaysia	Certification	2 000,00
University of Technology Malaysia	Malaysia	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	500,00
University of Technology Malaysia	Malaysia	Skills4.0 Local Website design & maintanence	1 500,00
University of Technology Malaysia	Malaysia	Certification	2 000,00

Most of the acquisitions took place during the project, but some expenses were covered by the partner universities, especially in communication, printing of documents... this is considered as co-financing.

The detail of the sub-contracting expenses is presented in the following table:

UNIVERSITY	SUBCONTRACTING	AMOUNT (EUR	USED	REMAINING
ULL	Printing of project publications: Industry 4.0 analysis, Skills 4.0 Glossary & recommendation	1 000,00 €	- €	1 000,00 €
ULL	Financial audit	4 000,00 €	4 000,00 €	- €
CMU	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	1 000,00 €	- €	PENDING
CMU	Skills4.0 Local Website design & maintenence	2 000,00 €	1 455,00 €	545,00 €
CMU	Certification	2 000,00 €	- €	2 000,00 €
KU	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	1 000,00 €	- €	PENDING
KU	Skills4.0 Local Website design & maintanence	2 000,00 €	1 455,00 €	545,00 €
KU	Certification	2 000,00 €	- €	2 000,00 €
CDU	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	1 000,00 €	- €	PENDING
CDU	Skills4.0 Local Website design & maintanence	2 000,00 €	3 206,36 €	- 1 206,36 €
CDU	Certification	2 000,00 €	- €	2 000,00 €
CUIT	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	1 000,00 €	- €	PENDING
CUIT	Skills4.0 Local Website design & maintanence	2 000,00 €	1 455,00 €	545,00 €
CUIT	Certification	2 000,00 €	- €	2 000,00 €
UPM	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	500,00 €	1 296,68 €	- 796,68 €
UPM	Skills4.0 Local Website design & maintanence	1 500,00 €	1 090,00 €	410,00 €
UPM	Certification	2 000,00 €	- €	2 000,00 €
UTM	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	500,00 €	232,33 €	267,67 €
UTM	Skills4.0 Local Website design & maintanence	1 500,00 €	1 090,00 €	410,00 €
UTM	Certification	2 000,00 €	- €	2 000,00 €

UNIVERSITY	SUBCONTRACTING	AMOUNT (EUR	USED	REMAINING
ULL	Printing of project publications: Industry 4.0 analysis, Skills 4.0 Glossary & recommendation	1 000,00 €	- €	1 000,00 €
ULL	Financial audit	4 000,00 €	4 000,00 €	- €
CMU	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	1 000,00 €	- €	PENDING
CMU	Skills4.0 Local Website design & maintenence	2 000,00 €	1 455,00 €	545,00 €
CMU	Certification	2 000,00 €	- €	2 000,00 €
KU	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	1 000,00 €	- €	PENDING
KU	Skills4.0 Local Website design & maintanence	2 000,00 €	1 455,00 €	545,00 €
KU	Certification	2 000,00 €	- €	2 000,00 €
CDU	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	1 000,00 €	- €	PENDING
CDU	Skills4.0 Local Website design & maintanence	2 000,00 €	3 206,36 €	- 1 206,36 €
CDU	Certification	2 000,00 €	- €	2 000,00 €
CUIT	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	1 000,00 €	- €	PENDING
CUIT	Skills4.0 Local Website design & maintanence	2 000,00 €	1 455,00 €	545,00 €
CUIT	Certification	2 000,00 €	- €	2 000,00 €
UPM	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	500,00 €	1 296,68 €	- 796,68 €
UPM	Skills4.0 Local Website design & maintanence	1 500,00 €	1 090,00 €	410,00 €
UPM	Certification	2 000,00 €	- €	2 000,00 €
UTM	Printing for project leaflets, posters and other materials + printing materials for on-campus campaigns	500,00 €	232,33 €	267,67 €
UTM	Skills4.0 Local Website design & maintanence	1 500,00 €	1 090,00 €	410,00 €
UTM	Certification	2 000,00 €	- €	2 000,00 €

UNIVERSITY	SUPPORTING DOCUMENTS	INVOICE DATE	SUPPLIERS	PRICE	CURRENCY	EUROS
CDU	INV: 14798621	25/10/19	ShanXi pu ai si dian zi ke ji you xian gong si	6 796,12	CNY	859,58 €
CDU	INV: 12221932	12/06/20	ShanXi pu ai si dian zi ke ji you xian gong si	6 930,69	CNY	870,60 €
CMU	FT 2022/87	08/07/22	JAVALI	1 455,00	EUR	1 455,00 €
KU	FT 2022/88	08/07/22	JAVALI	1 455,00	EUR	1 455,00 €
CDU	FT 2022/89	08/07/22	JAVALI	1 455,00	EUR	1 455,00 €
CUIT	FT 2022/90	08/07/22	JAVALI	1 455,00	EUR	1 455,00 €
UPM	FT 2022/91	08/07/22	JAVALI	1 090,00	EUR	1 455,00 €
UTM	FT 2022/92	08/07/22	JAVALI	1 090,00	EUR	1 455,00 €
UTM	INV 23624	25/06/22	AL FATEH PRINTING	575,00	MYR	124,26 €
UTM	CR 000722	31/07/22	INDAH ZZ TRADING	500,00	MYR	108,07 €
UPM	Jelita 0107-20	23/07/22	JELITA IMAGE	6 000,00	MYR	1 296,68 €

- The certification budget of the partners was used for the global Certification Audit of the project (by KPMG, see the Audit certificate). The PO of the Shyfte project validated the fact that the sub-contracting remaining budget could be used for the certification audit (10 000€ instead 4 000 € planned for ULL).
- The “Skills 4.0 local website design & maintenance” budget of the partners were used to develop and implement the Learning Centers for the four Pilots.

3.7 Teaching / Training Activities

The main KPI’s of the project are the following:

- Number of partner country "HEIs' students" trained → **400 students**
- Number of partner country "HEIs' academic staff" trained → **214 trainers**
- Number of partner country "non-HEI individuals" trained (priv. sector, NGOs, civil servants, etc.) → **20 non-HEI individuals trained**

The main results of the Shyfte project are summarized in the following sections:

Learning Materials: For the four domains defined in the project, a total of **35 modules** have been developed.

T2.1 – Domain 1: Industrial Engineering and Business Management
- **6** modules developed for Industrial Engineering
- **5** modules developed for Business Management

T2.2 – Domain 2: Software Engineering and Big data analysis
24. **5** Modules developed for SE & Bigdata analysis

T2.3 – Domain 3: Wireless networks analytics
25. **7** Modules developed for wireless networks analytics

T2.4 – Domain 4: Artificial Intelligence
26. **12** Modules developed for Artificial Intelligence

Training of the Trainers Sessions: During the project, for the four domains, **37 Training for the Trainers sessions** were organized. They allowed the training of **214** trainers.

- Domain 1: CMU **49** trainers ; KU **25** trainers
- Domain 2: **31** trainers from CDU and CUIT
- Domain 3: UPM **56** trainers
- Domain 4: UTM **53** trainers

Among these trainers, **24** trainers from partner universities have been trained.

Among these trainers, **20** persons from different companies have been trained.

A summary of these training sessions is presented in the following table. The details of each of these training sessions are presented in Deliverables D2.1 to D2.4

Training of Students Sessions: During the project, for the four domains, **28 Training of Students sessions** were organized.

They allowed the training of **400** students.

- Domain 1: **137** students from CMU and KU attended the different courses (**94** CMU & **43** KU)
- Domain 2: **144** students from CDU and CUIT attended the courses (**120** CUIT & **24** CDU)
- Domain 3: **69** students from UPM attended the different courses
- Domain 4: **50** students from UTM attended the different courses

A summary of these training sessions is presented in the following table. The details of each of these training sessions are presented in Deliverables D2.1 to D2.4

3.8 Involvement of partners and stakeholders

The organization putted in place allows each partner to play a specific role in the management and the development of the project. The local coordinators were involved

in the Project Management Board, and one staff from each partner institution was leading the WPs and the Tasks.

The Work package Leaders managed their WP, in cooperation with Task Leaders within them. They arranged technical meetings for their WP.

The WP and Tasks leaders have been designated at the project start as follows:

• WP1 was co-leaded by CMU-COGNITUS

. Task T1.1 was leaded by ULL

. Task T1.2 was leaded by UNS

. Task T1.3 was leaded by UNL

. Task T1.4 was leaded by UNL

. Task T1.5 is led by ULL

• WP2 was co-leaded by ULL-UPM

. Task T2.1 was leaded by CMU-KU

. Task T2.2 was leaded by CDU-CUIT

. Task T2.3 was leaded by UPM

. Task T2.4 was leaded by UTM

. Task T2.5 was leaded by UNL

• WP3 was co-leaded by CUIT-UNS

. Task T3.1 was leaded by UNS

. Task T3.2 was leaded by UNL

. Task T3.3 was leaded by CUIT

. Task T3.4 was leaded by CMU

• WP4 was co-leaded by UNL-CDU

. Task T4.1 was leaded by UNS

. Task T4.2 was leaded by CDU

. Task T4.3 was leaded by UNL

. Task T4.4 was leaded by ULL

• WP5 was leaded by ULL

. Task T5.1 was leaded by ULL

. Task T5.2 was leaded by UNS

The main objective of the Shyfte project was to develop 4 Learning Centers of Excellence in the PCs HEIs. These Learning Centers concern four main domains of skills for the industry of the future:

. The domain 1: Industrial Engineering and Management is leaded by CMU and KU.

. The domain 2: Software Engineering and Big Data Analysis is leaded by CDU and CUIT.

. The domain 3: Wireless Networks Analytics is leaded by UPM.

The domain 4: Artificial Intelligence is leaded by UTM.

At the end of the project, we have not yet strongly involved the public authorities of the partner countries, outside the governing bodies of our institutions. But we have started to work and communicate with companies and socio-economic organizations. For the analysis of skills needs and the gap with existing curricula, SMEs and industrial companies were involved in the development of the project (WP1). We organized five workshops and 4 visits in industrial companies in Thailand and China and nearly 300 companies have been surveyed in the Asian countries.

As example, one of the workshops in Chiang Mai addressed two different European projects:

• “SME 4.0 – Smart Manufacturing and Logistics for SMEs in an X-to-order and Mass Customization Environment” (EU Horizon 2020 R&I programme) By Assoc.Prof.Dr. Sakgasem Ramingwong, CMU SME 4.0 representative

• “MISE - Curriculum Development of master’s degree Program in Industrial Engineering for Thailand Sustainable Smart Industry (MSIE4.0)” (Erasmus+ KA2 project) By Assoc.Prof.Dr. Wichai Chattinawat, CMU MSIE Project Manager.

Another industrial workshop was organized in Northern Science and Technology Park in Chiang Mai (1 industrial SME, 3 start-ups and around 15 researchers from industrial & computer engineering joined the meeting). The main topic was: “Roles of Science and Technology Park to Promote University/Industry Collaboration” By Dr. Tanyanuparb Anantana

The objective of these workshops and industrial visits were to discuss different solutions and try to get new ideas or approaches to our Shyfte project.

All partners have made the necessary efforts to ensure the success of the project.

As soon as the training of trainers’ sessions began, we increased our communication with our institutions and with other universities in partner countries. In the same way, we started to disseminate information on the Learning Centers and on the Learning Materials to the partner companies of our institutions and to the local authorities.

Another issue concerned, Cognitus, the project partner, which contributed to all the WPs and tasks assigned to it. The collaboration was fruitful because of Cognitus' expertise in computer technologies, and in particular, artificial intelligence, deep learning, machine learning, big data...

Cognitus was the co-leader of the WP1, it has actively participated in the analysis of the gaps between the needs of companies in terms of knowledge and the contents of the training courses proposed by the universities. Cognitus participated in the elaboration of questionnaires for companies and in the analysis of the answers obtained. They accompanied and validated the knowledge models defined to respond to the observed gaps.

Cognitus worked also with all the partners in the elaboration of the strategic quality plan, the dissemination strategy, the global management of the project.

This was a bit more difficult during the containment period related to the Covid-19 crisis. Cognitus continued to work and collaborate with the project members. But the company was affected by the health crisis and was forced to stop its activity in the project in July 2021, and could not continue to collaborate during the 10-month extension period of the project.

We informed our PO about the situation, and we explained that the absence of this partner during the end of the project would not have an impact on the efficiency of the project.

3.9 Management of the grant

We organized the Shyfte 4.0 management structure in three mains pillars:

1. Project Coordinator, University Lumière Lyon 2 (ULL), for monitoring and centralizing the project progress by ensuring administrative and contractual ties to both consortium members and EACEA.

2. Project Management Board (PMB): The main role of the PMB was to control the management of the project (work plan, timetable, activities outcomes) and to verify that dissemination activities were performed well and via a documented process.

To monitor the project, we defined in the quality assurance system a QA Matrix and QA Performance Indicators table (see. Deliverable D5.1 section 9). For all the WPs, every task and activity have QA Indicators which were filled out by the task's leaders: 28 indicators for WP1, 32 for WP2, 23 for WP3, 32 for WP4 and 11 for WP5.

The following are examples of specific project management indicators (WP5):

• WP5-T5.1: The assigned tasks start and finish on time

• WP5-T5.1: Number of deliverables finished on time

• WP5-T5.2: Number of QA procedures defined

• WP5-T5.2: Number of travel reports

• WP5-T5.2: Number of publications in international conferences

•...

3. The Advisory Board was composed by the associated partners: Linde Home Care, KnowledgeBiz, Malaysians Communications and Multimedia Commission (MCMC), and Centre of Artificial Intelligence and Robotics (CAIRO). It was consulted for the validation of activities concerning the industrial sector. It also helped providing advice on how to enhance the impact of the project.

Regular consortium meetings (PMB) were scheduled every 2 or 3 months. In addition to the physical meetings of the consortium (10 meetings during the project) remote meetings were also regularly scheduled (44 virtual meeting)

The collaboration within the Shyfte consortium was implemented through a dedicated platform (OwnCloud), to share projects documents, including grant agreement, reporting, meeting minutes, training materials... and to facilitate the coordination of the project members. The structure of the collaboration platform is described in the D5.1 Project Handbook, Section 11.

We did not have to change the project management organization.We finalized on time the Partnership Agreements (PA) and the Grant Agreement between the partners:

• During the Kick-off-meeting in Lyon (Jan. 2019), ULL presented the PA to all partners. Following these exchanges, we decided to transfer the budgets to each partner, except for travel budget, because we had a rather reactive market in place in our university. All partners validated these rules and signed the PA on time

• The project monitoring was built around a common cloud space where all documents were made available to the partners. A mailing list has been created gathering all the participants as well as a mailing for the PMB and for the WP leaders

• An Excel file was available on the platform in which each partner could find: the Gantt chart, the efforts, the deliverables by tasks, the work plan as well as the future meetings and the travel plan.

• Meetings were planned several months in advance. At the end of each physical meeting, we decided the exact date of next meeting in agreement with all partners. This is in order to facilitate visa applications and internal organization. The agenda was sent 1 to 2 months in advance. We had also provided a template to harmonize the presentations, the agenda and minutes, as well as the different logos to be used

The partnership was stable, and the role of each partner was clearly defined during the project.

The only change we have seen is the issue with P4 partner Cognitus, which was forced to discontinue in July 2021 as a result of the Covid-19 crisis. The departure of this partner did not affect the end of the project, as we were in the train-the-trainer and student training phase (tasks for which, Cognitus was not expected to play a significant role).

3.10 Impact and Sustainability

3.11 Dissemination

From the first months of the project, a website was developed to allow active communication around the project: www.shyfte.eu The website structure is detailed in the deliverable D4.2.

The homepage provides information and the latest project news; the menus provide access to the following pages:

• Project: Aims, Objectives, Organization, Schedule

• Partners

• Results: KPIs, Deliverables, Publications, Learning Center (4 Pilots)

• Pilots

• Dissemination

• News & events

• Contacts

Links to social networks are also provided on the website.

We encountered a technical problem from May 19 to July 19, period during which the website was not accessible (the server was hosted by our partner in China). We solved the problem in July 2019 by relocating the server to Lyon (ULL).

The communication of the project was based on 2 levels:

• Internal Communication: a project information management tool has been set-up: https://disp-ds.univ- lyon2.fr/owncloud for team collaboration. All documents are stored on this cloud. It was an important tool to share also the outcomes and deliverables between the partners. Specific mailing lists, used only by subscribers, were used to ease communication (eg. the main mailing shyfte@shyfte.eu is used for all the members). Communication platforms (Teams/Zoom) were also used to provide a digital workspace to support the virtual communication between project members.

• External Communication: since the start of the project, the partners worked on a dissemination and exploitation plan with the following main objectives:

- Visibility: identify a set of entities where to make a presentation of the project
- Dissemination: identify the events where to communicate the results
- Make a dissemination map with locations and dates
- Exploitation: identify the industries where to present the Skills Learning centers.

This dissemination plan is detailed in the deliverable D4.1. It describes the dissemination opportunities identified through traditional communication channels such as events (conferences, seminars...), project publications (leaflets, press releases, conference papers, scientific journals...). Banners has been edited by some partners as China, Thailand, and France, complemented also by online activities based around the website, and through the main social networks (Facebook, Youtube...).

During the project, we have organized **10** industrial workshops involving academics and companies, **4** visits to industrial companies and **5** seminars to present the project objectives and outputs. The partner Cognitus was invited as **Keynote Speaker** in the 8th International Conference on Innovation and New Trends in Information, to present the theme of the Shyfte 4.0. We have organized **1** special session in the IEEE 15th China-Europe International Symposium on Software Engineering Education, and we presented **20** papers in international conferences to present the objectives and results. We have also published **7** papers in international journals.

All these events, both at the local (each partner university), national (each partner country) and international levels, ensure that the project and the Learning Centres will continue to be used and develop new services after the project ends. And that companies will continue to be involved in the development of these services and in the training of their employees.

The results of the Dissemination are detailed in the deliverables: D4.1 to D4.7 and on the Syfte website (section "Dissemination")

3.12 Sustainability / exploitation of results

The project is finished, and it is possible to affirm that the project development has been of considerable interest, involving many staffs and companies during the workshops, information seminars, conferences and raising awareness on the issues of developing Skills 4.0 Learning Centers in the PC universities.

The dissemination plan describes the opportunities identified through traditional communication channels such as event attendance (conferences, seminars, workshops), project publications (leaflets, press releases, conference papers), and project presentations to local stakeholders; complemented also by online activities through the main social platforms (Facebook, Youtube...). The dissemination activities have been designed to target the key audiences and stakeholders and to maximize awareness of Shyfte objectives and training activities. The dissemination and exploitation strategy are defined in the deliverable D4.1 completed on time (Feb. 2019). From the start of the project, dissemination was one of the important topics on project meetings (ideas, suggestions and contributions). We have prepared templates, drafts of documents for external communication and project logo.

The main dissemination actions were as follows:

- ULL (France) developed a Kakemono and project banner for the project kick-off meeting in January 2019. CMU (Thailand), CDU & CUIT (China), UNS (Italy) and UNL (Portugal) did the same for publicity and communication on the project during the physical meetings in their countries

- Each partner prepared and executed dissemination plan (min 3 activities on local and national level, and at least 2 on Int. level. These partners' dissemination plans were discussed and merged in the global Shyfte dissemination and exploitation plan (deliverable D4.1).

- We have developed the project web site since the start of the project: http://www.shyfte.eu, project Facebook profile: https://www.facebook.com/shyfteproject/ and Youtube channel. These website and social networks were used as soon as we started the meetings and the training sessions (trainers and students). They were useful to advertise the training sessions, make the Learning Centre known and to collect feedback and assessment from the trainees.

- From the first months of the project, a website was developed to allow active communication around the Shyfte project: www.shyfte.eu. Specific websites or links to the universities websites were also developed by the partners universities (in English and in the local language) in order to present the Learning Centers and the training sessions for students and companies.

- Each partner has dissemination table for monitoring and reporting about dissemination activities (type of event, participants etc.). This list is forwarded regularly to the WP4 Tasks leaders and this shows that the dissemination activities were very diverse, and were conducted on various levels (Deliverables D4.4 to D4.7)

- During the project, we have organized **10** industrial workshops involving academics and companies, **4** visits to industrial companies and **5** seminars to analyse the companies' needs in terms of skills and to present the project objectives and outputs. We have organized **1** special session in the IEEE 15th China-Europe International

Symposium on Software Engineering Education, and we presented **20** papers in international conferences to present the objectives and results. We have also published **7** papers in international journals.

All these events, both at the local (each partner university), national (each partner country) and international levels, ensure that the project and the Learning Centres will continue to be used and develop new services after the project ends. And that companies will continue to be involved in the development of these services and in the training of their employees.

To perpetuate the use of the Learning Centers we defined, with all the partners of the project HEIs and SMEs, a sustainability assurance plan for their quality certification.

The objective is to obtain ISO 9001 quality certification in the medium term. To achieve this, the Learning Centers have been designed based on a process approach to be compatible with ISO certification.

Procedures have been defined for the main steps of the main processes:

- registration of trainees,
- evaluation of their maturity level,
- training programs proposal,
- evaluation of training programs
- …

Based on this, a sustainability plan is designed towards the designated HEIs of the Partners Countries to ensure the continuation of this key activity beyond the end of the project.

The plan to perpetuate the use of the Learning Centers has been defined by each partner in order to sustain their use. These sustainability actions have been described in deliverables D2.1 to D2.4 (which describe the 4 pilots developed within the project).

The key issues to ensure the sustainability of the Learning Centers are:

- The assessment of the Learning Centers' services and learning materials
- The quality certification of the LC (IS09001 processes QMS)
- The definition of a Business/Economic model

- The first level of sustainability is **to reuse the learning materials developed in each of the pilots** (courses, hands-on, use of equipment...). For this, depending on the partners, these modules will be integrated, partially or totally, into existing

programs. For others, the modules will be proposed as optional modules that can be validated (credits) in existing programs. Finally, some modules will be integrated into the Long-life education platforms of the partner universities.

- The second level of sustainability concerns the Learning Centers. **The principle is that the learning centers will last after the end of the project,** and that the partner universities will rely on them to increase their collaboration with companies and other universities in their country. For this, the learning centers have been designed to allow a follow-up of the interactions (LC observatory). The partner universities will therefore continue to communicate and disseminate information to ensure that these Learning Centers become a real center of expertise. To guarantee the sustainability of the learning centers, the quality procedures put in place and the training of quality managers in internal audits will make it possible to consider quality certification (ISO 9001) for the Learning Centers within two years. This delay is necessary because to be certified, a learning center must have been used for a period.
- From an **economic point of view**, the partner universities are committed to continuing to invest in order to ensure the sustainability of the Learning Centers. They have clearly understood the value of these centers of excellence for the development of their students' skills and for promoting continuing education among companies. To this end, rates have been defined and will be integrated into the Learning Centers.

In addition to this global sustainable assurance plan some local actions were defined in each partner university.

The Shyfte Sustainability Assurance Plan is described in the ***Deliverable D3.3***

The Shyfte Sustainability Specific Actions are described in the ***Deliverable D2.1 to D2.4 (Pilots)***

3.13 Unexpected outcomes / spin-off effects

Within the framework of the project, we had a main unexpected outcome, which concerned all the partner countries, and which was the health crisis linked to Covid-19.

This international pandemic did not allow us to continue in the same way the work initiated during the first part of the project (from November 2018 to January 2020). Physical meetings were no longer possible, which impacted and modified the way of managing the project (WP5), the organization of training sessions (WP2), the organization of dissemination events (WP4) ...

The main issues concerned training sessions and events related to the dissemination of the project:

- For the training sessions, we quickly set up a first phase of distance learning sessions, which went very well, but we were behind the initial planning, and we were not able to make the best use of the equipment acquired in this first phase. The objective was to wait until the end of the pandemic to restart face-to-face training sessions.
- For the dissemination, it was complicated to continue the dynamics of company visits, organization of workshops and seminars and participation in conferences. We adapted, and we organized remote events, but the overall quality was not always the same. On the other hand, we made more use of the website (main one, and that of the partner universities) and social networks (mainly Facebook), to keep informing about the progress of the project.

4. Conclusion

The objective of this deliverable is to describe the progress report (mid-term) and the final report of the project.

In order to summarize 4 years of work, as well as the main results of the project, we decided to present the main topics of these two reports, and to summarize to main results, outcomes and issues of the project.

Shyfte 4.0 main KPI's

- The Quality Assurance Matrix and Indicators

Shyfte most important results:

- Learning Materials development
- Training of the Trainers Sessions
- Training of Students Sessions
- Learning Centers implementation

Shyfte 4.0 main dissemination results

- Scientific dissemination: publications in conferences and journals
- Industrial & academic dissemination: industrial workshops, meetings, seminars and dissemination events
- General dissemination: Shyfte project in the medias (websites, social networks, youtube…)

Annex A: Final Report Table of Achieved Results

TABLE OF ACHIEVED RESULTS

Title and reference number of the work package (WP)	**PREPARATION: Skills 4.0 Analysis and Design of Teaching and Learning material (WP1)**

Indicators of achievement and or/performance as indicated in the project proposal	• The assigned tasks start and finish on time • Reporting documents will be ready by the deadline with the proper content • The number and the quality of the references • The number of SME's involved in the survey per country • A new Skills model is proposed and validated • The number of modules defined per domain • A syllabus is defined for each module • A learning strategy is defined per domain • The pilots are defined per domain • The sessions for the training of the trainers are scheduled • The sessions for the training of the students are scheduled • Number of potential trainers trained • Number of potential students trained

Activities carried out to date to achieve this result:

Activity N°	Activity Title	Start date	End date	Place	Description of the activity carried out	Specific and measurable indicators of achievement
T1.1- 1	Literature Review of Industry4.0	15/11/2018	31/07/2019		The objective of this task is to highlight the role and importance of skills and competencies in Industry 4.0 and the requirement of new skills and programs in HEI's curricula in developed and developing countries.	- The deliverable D1.1 finished on time - The number of literatures referenced: **67**

T1.1- 2	Literature review: Definition of Industry 4.0	15/11/2018	31/07/2019		The D1.1 Deliverable describes the analysis of the skills and knowledge requirements. It also analyses the current teaching and learning methods in the area of Industry 4.0 and compares the evolution of skills to Skills4.0	- The quality of the literature referenced is "High" which can be justified by the following aspects:
						  - High relevance between the subject of the literature and project topic.
						  - **92%** of the referenced articles have been published in recent years (between 2016 and 2020)
						  - The referenced articles are peer-reviewed
						  - The referenced articles have been selected from tier-1 and tier-2 conferences and journals.
						  - The referenced articles are taken from well-reputed research databases include SCOPUS, ACM, IEEE, Google Scholar
						  - The mean value of total citations of literature referenced is: **78%**
						- The number of curricula and programs studied: **26**
						- Number of teaching/learning methods analyzed for the four domains: **14**
						- Number of Asian/European teaching/learning methods analyzed for the four domains: **19**
						- "High" quality study of knowledge and skill requirements
						- A comparative study was completed successfully for deeper

T1.1- 3	Literature review: Analysis of existing concepts & models	15/11/2018	31/07/2019		Analysis of the existing skills concepts and models	
T1.1- 4	Analyze of the current teaching and learning methods in Asia (per country & by domain)	15/11/2018	31/07/2019		Analysis of the existing teaching and learning methods	

						understanding the evolution skills 4.0 - A “high” quality analysis has been completed successfully and recommendations are proposed

T1.2 - 1	Identify the skills required by Industry4.0	15/11/2018	31/07/2019	Asia	Identify the skills required by Industry 4.0 by conducting surveys and in-depth interviews with industries, and companies in the project partner countries, organizing workshops with companies, and analyzing relevant reports from European and international research projects.	- The questionnaire has been developed and validated successfully in collaboration between industry and academic partners.
						- The number of SMEs surveyed in “China” is: **95**
						- The number of SMEs surveyed in “Malaysia” is: **100**
						- The number of SMEs surveyed in “Thailand” is: **100**
						- The number of replies returned by Chinese companies is: **87**
						  - Number of small companies surveyed: **5**
						  - Number of medium and big size companies surveyed: **82**
						- The number of replies returned by Malaysia companies is **86**
						  - Number of small companies interviewed: **19**
						  - Number of medium and big size companies interviewed **68**
						- The number of replies returned by Thailand companies is **92**
						  - Number of small companies interviewed **23**
						  - Number of medium and big size companies interviewed **69**

T1.2 - 2	Define the maturity model and the structure of the questionnaire (framework)	15/12/2018	15/03/2019		Design the maturity model and the questionnaire.	
T1.2 - 3	Define the questions & validation of the questionnaire	15/05/2019	15/03/2019		Validation of the questionnaire.	
T1.2 - 4	Deploy the questionnaire in Asia	15/02/2019	15/05/2019		Deploy the questionnaire	
T1.2 - 5	Summarize the survey	15/04/2019	31/07/2019		Analyze and synthesize the survey	

						- Number of workshops organized in “Chiang Mai” (**2**) - Number of workshops organized in “Chengdu” (**1**) - Number of relevant reports studied/investigated (**20** questions for the survey) - Maturity model was defined successfully in collaboration between the industry and academic partners - “High” quality analysis is completed successfully - Number and quality of the recommendations based on this analysis (6 factors were analyzed to better understand the benefits of Industry 4.0 in Asian industrial enterprises based on Structural Equation Modeling)
T1.3 - 1	Analyze the gap by overlapping the skills4.0 with the existing skills in HEIs.	15/05/2019	29/02/2020		Two main objectives of this task: - Analyze the gap between the skills acquired in training in HEIs and the skills required by Industry4.0(defined in the T1.2). - Develop a new model of Skills4.0 in-line with the needs of the market (emerging skills; disparate skills, shift skills...). The D1.2 Deliverable produced by M6 analyses the gap by overlapping the skills 4.0 with the existing skills in HEIs. This analysis allows the development of an emerging model for skills 4.0	- A “High” quality gap analysis is completed successfully - **35** Topics offered by HEIs Asian curricula that correspond to Industry 4.0 required skills are studied: - **6** are vital for companies - **9** are of very high importance for companies - **8** are of high importance for companies

					(emerging skills; disparate skills, shift skills...).	- **4** are not very important for companies - **7** are not important for companies - **1** has not yet been considered by companies Curricula coverage according to the importance of the topics for companies: - On 6 which are vital, **4** are covered - On 9 which are of very high importance, **3** are covered - On 8 which are of high importance, **3** are covered - On 4 which are not very important, **1** is covered - On the 8 last (not important, not yet been considered) **1** is covered - A "High" quality new skill model is developed. - The new skill model allows to quantify and qualify knowledge transference based on KPIs associated with the maturity in 4 Shyfte domains. - Number of publications: **4** - This new skill model will be implemented & validated in WP2
T1.3 - 2	Analyze the gap by overlapping the skills4.0 with the existing skills in HEIs.	15/05/2019	15/07/2019		The detailed gap analysis	
T1.3 - 3	Develop an emerging model: Structure & fundamental	15/07/2019	15/10/2019		The design of the Skill emerging model	
T1.3 - 4	Develop an emerging model: Emerging Model first draft	15/10/2019	15/01/2020		The development of the Skill emerging model	
T1.3 - 5	Develop an emerging model: Refinement of Skill Model 4.0	15/01/2020	29/02/2020		Validation and refinement of the Skill 4.0 model	
T1.4 - 1	Develop the Skills 4.0 learning framework - Identify the relationship	15/05/2019	29/02/2020		Develop the teaching and learning framework, related to the four domains, to minimize the skills gap according to HEIs	- The relationship between the skills and the Shyfte four domains is defined

	between the skill4.0 and the Shyfte 4 domains				and Industry 4.0 requirements (defined in task T1.3).
					The D1.3 Deliverable, based on the report D1.2, proposes skills 4.0 learning & teaching framework to minimize the main skills gap, identifying the relationship between the skills and the Shyfte four domains
						- The "required" skill set is identified
						- The number of skills set per domain are:
						  - Industrial Engineering Management: **7**
						  - Software Engineering and Big Data Analytics: **4**
						  - Wireless and Networks Analytics: **5**
						  - Artificial Intelligence: **3**
						- The "required" maturity levels of the trainees are identified
						- The number of modules defined per domain:
						  - **22** modules syllabus defined for IE domain
						  - **7** modules syllabus defined for Business Mgt domain
						  - **18** modules syllabus defined for SE& Bigdata domain
						  - **17** modules syllabus defined for Wireless domain
						  - **15** modules syllabus defined for AI domain
						- An efficient learning framework was defined
						- The module's syllabus is defined
						  - **9** modules syllabus defined for IE domain
						  - **7** modules syllabus defined for Business Mgt domain
						  - **5** modules syllabus defined for SE& Bigdata domain

T1.4 - 2	Develop the Skills 4.0 learning framework	15/05/2019	15/12/2019		Design and definition of the Skills 4.0 Learning Framework	
T1.4 - 3	Identify the relationship between the skill4.0 and the Shyfte 4 domains	15/12/2019	20/02/2019		Identification of the required Skill sets per domain.	

						- **6** modules syllabus defined for Wireless domain - **13** modules syllabus defined for AI domain
T1.5 - 1	Design teaching programs and learning materials for the 4 domains.	15/05/2019	30/06/2020		- Identify the content and main component in response to the above-mentioned areas through coordination between universities and companies. - Design and develop teaching and learning strategies according to WP2 pilots. The D1.4 Deliverable concerns the teaching and learning strategies for deploying the four pilots of the WP2.	- The learning strategy per domain is defined - The pilots per domain are defined: - **16** detailed syllabus is defined for domain 1 - **5** detailed syllabus is defined for domain 2 - **6** detailed syllabus is defined for domain 3 - **13** detailed syllabus is defined for domain 4 - The sessions for the Training of the Trainers ToT are scheduled: - **14** ToT sessions scheduled for domain 1 - **4** ToT sessions scheduled for domain 2 - **6** ToT sessions scheduled for domain 3 - **6** ToT sessions scheduled for domain 4 - The sessions for the Training of the Students ToS are scheduled: - **14** ToS sessions scheduled for domain 1 - **4** ToS sessions scheduled for domain 2 - **6** ToS sessions scheduled for domain 3

						- **10** ToS sessions scheduled for domain 4 - The number of potential trainers projected: - **12** trainers identified for domain 1 - **5** trainers identified for domain 2 - **6** trainers identified for domain 3 - **10** trainers identified for domain 4 - The number of potential students projected: - **100 to 120** students trained from CMU & KU (domain1) - **100 to 120** students trained from CDU& CUIT (domain2) - **40 to 50** students trained from UPM& UTM (domain3) - **40 to 50** students trained from UTM& UPM (domain4) - Total number of potential students projected: **up to 300** - Number of publications in conferenced: **10**

Changes that have occurred in this result since the previous approved report:

No changes occurred on this work package since the original proposal and the previous approved report.

TABLE OF ACHIEVED RESULTS

Title and reference number of the work package (WP)	**DEVELOPMENT: implementation of Shyfte4.0 framework - Learning and training (WP2)**

Indicators of achievement and or/performance as indicated in the project proposal	• Number of modules developed • Number of potential trainers • Number of trainers trained • Number of potential students • Number of students trained • Pilots' implementation (number of learning sessions, modules...) • Quantity and quality of self- assessment documents • Number of Skills 4.0 Learning center implemented

Activities carried out to date to achieve this result:

Activity N°	Activity Title	Start date	End date	Place	Description of the activity carried out	Specific and measurable indicators of achievement
T2.1	Pilot in Domain 1- Industrial engineering and management	15/09/2019	15/07/2021	Thailand	The task T2.1 describes the implementation of a first pilot project in Thailand to improve the quality of "Industrial Engineering and Management" skills.	
T2.1-1	Learning materials development	28/10/2019	01/11/2019	China	Meeting in Chengdu: modules definition (syllabus), use cases, equipment used, trainers' identification…	• 22 modules have been identified for the Industrial Eng. domain (based on the skills set and level of the trainees) • 7 modules have been identified for the Business Mgt domain

						• **9** modules detailed syllabus have been defined for IE domain • **7** modules detailed syllabus have been defined for Business Mgt domain
T2.1-2	Learning materials development	09/12/2019	13/12/2019	Benevento	Meeting in Benevento: modules content validation. Discussion with local experts in Industrial Engineering and Management	• Validation of **6** main modules detailed for IE domain • Validation of **5** main modules detailed for Business Mgt domain
T2.1-3	Learning materials development	03/02/2020	07/02/2020	Lyon	Meeting in Lyon: learning materials development strategy & Training of the trainers planning	• **16** contributors to the development of learning materials identified • **12** Module trainers identified • **1** internal reviewer identified per module • **1** external reviewer identified per module and per university partner • **14** Training of the Trainers sessions scheduled • **14** Training of Students sessions scheduled
T2.1-0	Learning Material development	01/10/2019	31/12/2020		Skill set and modules developed: theoretical part, industrial use cases, learning method, data sets and equipment used…	• **6 new modules** are developed for Industrial Engineering • **5 new modules** are developed for business management
T2.1- 1	Validation by the group of experts	31/12/2020	31/01/2020		The module validation process (by the Advisory Board and Academic experts)	• **11** modules reviewed by Internal and External experts
T2.1-4	Training of the Trainers sessions	01/07/2021	28/02/2022	Bangkok	Training of the Trainers at KU (Bangkok)	• **9 training sessions** of the trainers from July 2021 to February 2022 • **62 trainers trained** from KU • **4 staffs from partner** trained • **6 quality evaluation** questionnaires filled per modules

T2.1-4	Training of the Trainers sessions	01/07/2021	31/08/2021	Chiang Mai	Training of Trainers at CMU (Chiang Mai)	• **7 training sessions** of the trainers from July 2021 to August 2021 • **49 trainers trained** from CMU • **4 staff per partner** trained • **10 quality evaluation** questionnaires filled per modules
T2.1- 3	Learning materials assessment & update	01/04/2021	30/04/2021	Chiang Mai and Bangkok	Analysis of the quality questionnaire and assessment of the learning materials	• Having analysis of the training quality questionnaire • **1** improvement plan per module is defined • All the modules are updated
T2.1- 4	Student's maturity level assessment	01/05/2021	31/05/2021		Evaluation of the skills maturity students' level	• The maturity level is defined for each module
T2.1-5	Training of the Students	01/01/2022	04/08/2022	Bangkok/ Chiang Mai	Training of the students in CMU and KU: • 94 students in CMU • 43 students in KU	• **137 students trained** from CMU and KU – from January 2022 to August 2022 • **60%** of the students fill the quality evaluation questionnaire • **93.45%** of the students are globally satisfied
T2.1- 6	Learning materials assessment & update				Analysis of the quality questionnaire and assessment of the learning materials	• Having analysis of the training quality questionnaire • 1 improvement plan per module is defined • All the modules are updated
T2.1- 7	Training of Companies	01/07/2021	31/08/2021		Organize training for companies and evaluate the interest and quality of the training	• **5 persons** from five private companies trained by KU • **10 persons** form private companies trained by CMU • A quality evaluation questionnaire is filled • Analysis of the quality questionnaire is done

T2.2	Pilot in domain2 - Software Engineering and big data analysis	15/09/2019	15/07/2021	China	The T2.2 Task describes the implementation of a second pilot project in China to improve the "Software Engineering and big data analysis" skills.	
T2.2-1	Learning materials development	28/10/2019	01/11/2019	China	Meeting in Chengdu: modules definition (syllabus), use cases, equipment used, trainers' identification…	• **18** modules have been identified for the Software Eng. and Big data domain • **5** modules detailed syllabus have been defined for SE&BD domain
T2.2-2	Learning materials development	09/12/2019	13/12/2019	Benevento	Meeting in Benevento: modules content validation. Discussion with local experts in Software Engineering and Big data analysis	• Validation of 5 main modules detailed for SE&BD
T2.2-3	Learning materials development	03/02/2020	07/02/2020	Lyon	Meeting in Lyon: learning materials development strategy & Training of the trainers planning	• **5** contributors to the development of learning materials identified • **5** Module trainers identified • **1** internal reviewer identified per module • **1** external reviewer identified per module and per university partner • **4** Training of the Trainers sessions scheduled • **4** Training of Students sessions scheduled
T2.2- 0	Learning Material development	01/10/2019	01/09/2020	China	Skill set and modules developed: theoretical part, industrial use cases, learning method, data sets and equipment used…	• **5 Modules are developed** for SE & bigdata analysis
T2.2- 1	Validation by the group of expert	01/09/2020	01/10/2020	All	The module validation process (by the Advisory Board and Academic experts)	• **5** modules reviewed by Internal and External experts
T2.2- 2	Training of the Trainer's sessions	01/06/2021	26/02/2022	China	Training of the trainers in CDU and CUIT	• **7 training sessions** in CDU and CUIT from June 2021 to February 2022 • **31 trainers trained** from CDU and from CUIT • **1** staff per partner trained

						• **6 quality evaluation** questionnaires filled per module
T2.2- 3	Learning materials assessment & update			China	Analysis of the quality questionnaire and assessment of the learning materials	• Analysis of the training quality questionnaire • **1** improvement plan per module is defined • **5** the modules are updated
T2.2-5	Training of the Students	April 2022	May 2022	Chengdu	Training of the students in CDU and CUIT	• **5 training sessions** of the students from April 2022 to May 2022 • **22 students trained** (CDU) • **120 students trained** (CUIT • **92%** of the students filled the quality evaluation questionnaire • **91%** of the students are globally satisfied
T2.3- 6	Learning materials assessment & update			Chengdu	Analysis of the quality questionnaire and assessment of the learning materials	• Analysis of the training quality questionnaire • **1** overall improvement plan per module is defined • Pilot in Domain 2 updated **5** modules based on these feedbacks
T2.2- 7	Training of Companies			China	Organize training for companies and evaluate the interest and quality of the training.	• **5 persons** from one or different companies trained • A quality evaluation questionnaire is filled • Analysis of the quality questionnaire is done
T2.3	Pilot in domain3 Wireless networks analytics	15/09/2019	15/07/2021	Malaysia (UPM)	The T2.3 Task describes the implementation of the third pilot project in Malaysia to improve the “Wireless Networks Analytics” skills	
T2.3-1	Learning materials development	28/10/2019	01/11/2019	China	Meeting in Chengdu: modules definition (syllabus), use cases, equipment used, trainers’ identification…	• **17** modules have been identified for the Wireless domain

						• **6** modules are identified as the most requested skillsets by local SMEs based on the survey
T2.3-2	Learning materials development	09/12/2019	13/12/2019	Benevento	Meeting in Benevento: modules content validation. Discussion with local experts in Wireless networks analytics	• Validation of **6** main modules detailed for Wireless domain
T2.3- 0	Learning Material development	01/10/2019	15/10/2020	Malaysia	Skill set and modules developed: theoretical part, industrial use cases, learning method, data sets and equipment used…	• **7 Modules are developed** for Wireless Network domain
T2.3-3	Learning materials development	03/02/2020	07/02/2020	Lyon	Meeting in Lyon: learning materials development strategy & Training of the trainers planning	• **7** Module trainers identified • **1** internal reviewer identified per module • **1** external reviewer identified per module and per university partner • **6** Training of the Trainers sessions scheduled • **6** Training of Students sessions scheduled
T2.3- 1	Validation by the group of experts	15/10/2020	15/11/2020	Malaysia	The module validation process (by the Advisory Board and Academic experts)	• **7** modules reviewed by Internal & External experts

T2.3-4	Training of the Trainers	July 2021	April 2022	UPM	Training of the Trainers in UPM	• **7 training sessions** for the trainers in UPM from July 2021 and April 2022
						• **56 trainers trained** in UPM:
						  ○ **51** academics
						  ○ **5** from industry
						• **1** staff trained from CMU, UTM and KU
						• **31 quality evaluation** questionnaires filled up
						• **55%** (31 out of 56 trainers responded)
						• Analysis of the training quality questionnaire

						• **1** overall improvement plan proposed. • The **7** modules are updated
T2.3- 4	Student's maturity level assessment	01/03/2021	31/03/2021	Malaysia	Evaluation of the skills maturity students' level	• The maturity level is defined for each category of students
T2.3-5	Training of the Students	01/06/2022	30/06/2022	UPM	Training of the Students in UPM	• **5 training sessions** of the students in June 2022 • **69 students trained** (UPM) • **72%** of the trainees fill the quality evaluation questionnaire (50 out of 69 students responded) • **92,5%** of the students are globally satisfied • **70%** of the respondents highlighted that IoT and big data analytics are the most required skills in Wireless and Networks Analytics, based on surveys for the SMEs in Malaysia
T2.3- 6	Learning materials assessment & update			Malaysia	Analysis of the quality questionnaire and assessment of the learning materials	• Analysis of the training quality questionnaire • **1** overall improvement plan per module is defined • Pilot in Domain 3 developed 17 modules based on this feedback (**7** new modules are chosen for the ToT and ToS)
T2.3- 7	Training of Companies	01/07/2021	30/04/2022	Malaysia	Organize training for companies and evaluate the interest and quality of the training.	• **5** persons from (2 MCMC, 2 Vectolabs and 1 MIMOS) are trained • Certificate of Attendance have been given to all trainers • They suggested for face-to-face Training instead of online. For

						ToS, the second part (i.e. hands-on) were conducted in-person.
T2.4	Pilot in Domain4 - Artificial Intelligence.	15/09/2019	15/07/2021	Malaysia (UTM)	The T2.4 Task describes the implementation of a fourth pilot project in Malaysia to improve the "Artificial Intelligence" skills.	
T2.4-1	Learning materials development	28/10/2019	01/11/2019	China	Meeting in Chengdu: modules definition (syllabus), use cases, equipment used, trainers' identification…	• **13** modules have been identified for the AI domain • **13** modules detailed syllabus have been defined for AI domain
T2.4-2	Learning materials development	09/12/2019	13/12/2019	Benevento	Meeting in Benevento: modules content validation. Discussion with local experts in Artificial Intelligence	• Validation of **5** main modules detailed for AI domain
T2.4-3	Learning materials development	03/02/2020	07/02/2020	Lyon	Meeting in Lyon: learning materials development strategy & Training of the trainers planning	• **9** contributors to the development of learning materials identified • **10** Module trainers identified • **1** internal reviewer identified per module • **1** external reviewer identified per module and per university partner • **2** Training of the Trainers sessions scheduled • **5** Training of Students sessions scheduled
T2.4- 0	Learning Material development	01/10/2019	15/10/2020	Malaysia	Skill set and modules developed: theoretical part, industrial use cases, learning method, data sets and equipment used…	• **12** Modules are developed for Artificial Intelligence domain
T2.4- 1	Validation by the group of expert	15/10/2020	15/11/2020	Malaysia	The module validation process (by the Advisory Board and Academic experts)	• **12** modules reviewed by Internal and External experts
T2.4- 2	Training of the Trainer's sessions	01/07/2021	28/02/2022	Malaysia	Training of the trainers in UTM	• **6 training sessions** in UTM in July 2021 and February 2022 • **53 trainers trained** (40 from UTM - UPM-9, CMU-3, KU-1)

						• **31 quality evaluation** questionnaires filled per module
T2.4- 3	Learning materials assessment & update			Malaysia	Analysis of the quality questionnaire and assessment of the learning materials	• Analysis of the training quality questionnaire • **1** improvement plan per module is defined • All the modules are updated
T2.4- 4	Student's maturity level assessment	01/06/2021	31/06/2021	Malaysia	Evaluation of the skills maturity students' level	• At least **3** evaluation assessment developed per module
T2.4- 5	Training of the student's sessions	01/06/2022	30/08/2022	Malaysia	Training of the students in UPM and UTM	• **6 training sessions** for students in UTM from June to August 2022 • **50** students trained (UTM) • **73%** of the students filled the quality evaluation questionnaire • **95%** of the students are globally satisfied
T2.4- 6	Learning materials assessment & update			Malaysia	Analysis of the quality questionnaire and assessment of the learning materials	• Analysis of the training quality questionnaire • **1** improvement plan per module is defined • All the modules are updated
T2.4- 7	Training of Companies	01/07/2021	28/02/2022	Malaysia	Organize training for companies and evaluate the interest and quality of the training.	• **3 persons** from different companies trained • A quality evaluation questionnaire is filled • Analysis of the quality questionnaire is done
T2.5 - 1	Develop Skills 4.0 based Training and Learning Center of Excellence	15/05/2020	14/11/2020	PC	The objective of the T2.5 Task is to define the protocol of operation and internal articulation of the Learning Center of Excellence, define the center's laboratory operation, define the diffusion and	- the architecture of the **4 learning centers** is defined - the functionalities and main services are described (identification, selection, registration, evaluation…).

					dissemination system and the internal evaluation system of the center's operation.	- the interactions between the global website and the local ones are identified - A dissemination strategy is proposed
T2.5 - 2	Develop Skills 4.0 based Training and Learning Center of Excellence	15/05/2020	14/06/2021	PC	The objective of the T2.6 task is to report the Lab set-up for applications developments and devices use and testing in prototypes. A methodology for technological innovations related to Industry 4.0 creation and testing will be presented. Guidelines to help teachers and students to use and create technological applications in an innovative way in teaching is also introduced.	- **4 Skills 4.0 learning center implemented** (one per Pilot) - A methodology for creation and testing is defined for the Learning centers - A quality evaluation questionnaire is defined for the learning centers - **1** guideline for teachers is defined (one per domain) - **1** guideline for students is defined (one per domain)
T2.5 – 3	Develop Skills 4.0 based Training and Learning Center of Excellence	15/05/2020	14/06/2021	PC	The objective of the T2.7 task is to report the methodology for the technical and business evaluation of innovative technological solutions that can be presented by the professors or students of the university.	- **1** Knowledge-based framework is defined for each learning center - **1** methodology for technical and business evaluation is defined for the 4 Learning centers

Changes that have occurred in this result since the previous approved report:

The main changes that have taken place relate to delays in:

- the implementation of the training of the trainers (ToT) *from June 2021 to February 2022 (instead March 2020 to January 2021)*
- the implementation of the training of the students (ToS) *from January 2022 to August 2022 (instead January 2021 to July 2021)*
- the development of the Learning Centers

Due to the Covid-19 pandemic, we were obliged to conduct the first part of the ToT sessions remotely. We asked for a 10-month extension of the project to be able to do a second part of the ToT sessions in face-to-face, as well as the students' training sessions.

The development of the Learning Centers was also delayed because we were not able to evaluate and validate the learning materials in time, so we had to postpone the development and validation phase of the Learning Centers. *from January 2022 to August 2022 (instead January 2021 to July 2021)*

TABLE OF ACHIEVED RESULTS

Title and reference number of the work package (WP)	**QUALITY PLAN (WP3)**

Indicators of achievement and or/performance as indicated in the project proposal	• Handbook • Number of trainers trained on Quality Management System • Number of trainers certified • Number of trainers trained • Quality audits of the trainers/teachers and students • Number of Quality Audits carried out per Learning Center • Number of SME's involved & surveyed • % of SME's satisfied by the Learning Centers services (per domain, per country) • % of SMEs that would recommend Learning Centers • To compare and analyze the job market before and after deploying proposed learning and teaching strategies in partner countries *(medium-term indicator)*

Activities carried out to date to achieve this result:

Activity N°	Activity Title	Start date	End date	Place	Description of the activity carried out	Specific and measurable indicators of achievement
T3.1	Strategic Quality Plan	15/12/18	15/11/2019	UNS	The objective of this first task is to define a strategic Quality Plan for to the learning programs and trainers' qualification. To ensure the adequate and accurate monitoring of the project preparation and development with high standard quality plan.	- The deliverable D3.1 was completed on time
T3.1-1	Validation of the learning program by the companies (advisory board)	15/12/18	14/10/2019		The module validation process by the Advisory Board and Industrial experts	- **1** evaluation quality questionnaire for the learning material defined - Number of experts per domain identified: **1 internal** & **1 external** per module - Quality indicators are defined

						- **4** impact indicators to establish a correlation between the domains (II_{SMP}, II_{AMS}, II_{QS}, II_{IQA})
T3.1-2	Validation of the learning program by the academics	15/12/18	14/10/2019	CUIT	The module validation process by the academic experts (1 expert per HEIs partner)	- Number of academic experts per domain: **1 internal** & **1 external** per module - **2** Productivity indicators (PI_m, Pi_e) to assess the teacher's responsibility in learning students. - **2** Level indicators (LI_{pk}, LI_{st}) to evaluate the learning of the topics. - **2** Level indicators (LI_a, LI_e) to evaluate the teacher.
T3.1-3	Define an evaluation questionnaire for the trainers	15/12/18	14/10/2019	UNL	Design and develop a quality questionnaire for the trainers. The questionnaire for the trainers and the KPI's are defined in the deliverable **D3.1**	- **10** questions related to the program, lessons and teaching examined by internal and external trainers - **5** questions related to the curricula examined by internal and external trainers - **1** Effectiveness Indicator (EI) to evaluate the training commitment undertaken by the organization towards students, with respect to the teaching actually provided. - **1** Load indicator (I_{lo}) to evaluate the actual work assigned. - **1** Compliance indicator (I_c) to assess the proportionality of the teaching material to the study topic. - **1** Efficiency Indicators (EfI) to evaluate the teacher's ability to arouse interest in students for the

						different domains examined ($E_f I_{SMP}, E_f I_{AMS}, E_f I_{QS}, E_f I_{IQA}$)
T3.1-4	Define an evaluation questionnaire for the students	15/12/18	14/10/2019	UPM	Design and develop a quality questionnaire for the students. The questionnaire for the students is defined in the deliverable **D3.1**	- Number of potential students filling the quality evaluation questionnaire: **70%** - **80%** of the students are globally satisfied
T3.2	Define a Training Quality Plan	15/11/2019	15/11/2021	UNL	The objectives of this task are to train the trainers in the Partners Countries to the basic of Quality Management Systems according to ISO 9001, and to propose an operative formation of the Quality Managers (QM) for quality audits of the Learning Processes. This task will focus on the formation quality plan with the relative quality indicators. The 4 Pilots implementation will integrate the TQP in the learning programs.	- The QMS learning material is defined - A Training quality plan is proposed per Learning centers (4)
T3.2-1	Implement quality audits to analyze and evaluate the transfer of skills 4.0 and measuring the impact of these skills in SME	15/11/2019	15/11/2021	UNL	Implement the Quality Management System based on ISO 9001, as a system integrated in Shyfte Learning Center of Excellence platform.	- Number of training quality audits scheduled per Learning Centers: **37** - Number of potential quality managers per Learning Centers: • **4** in domain 1; • **2** in domain 2; • **3** in domain 3 • **3** in domain 4
Activity N°	**Activity Title**	**Start date**	**End date**	**Place**	**Description of the activity to be carried out**	**Specific and measurable indicators of progress**
T3.2	Define a Formation Quality Plan	15/11/2019	15/11/2021	UNL	The objectives of this task are to train the trainers in the Partners Countries to the basic of Quality Management Systems according to ISO 9001, and to propose an operative formation of the Quality Managers (QM) for quality audits of the Learning Processes. The 4 Pilots	- The QMS learning material is defined - A Training Quality Plan is proposed per domain - Number of indicators defined in the TQP per domain (Pilot): **14**

					implementation will integrate the FQP in the learning programs.	
T3.2-1	Formation Quality Plan Implementation			PCs	Organize the Train of the Trainers session on QMS ISO 9001 in the Partners Countries - Quality Managers (QM) for quality audits of the Learning Processes.	- **12** trainers trained on QMS - Number of trainers satisfied by the QMS training (**80%)**
T3.2-1	Implement quality audits to analyze and evaluate the transfer of skills 4.0			UNL	Implement the ISO 9001 QMS, as a system integrated in Shyfte Learning Center of Excellence platform.	- The QMS is integrated in the Learning Materials - Number of trainers training quality audits scheduled: **3** - **30** potential trainers to be certified
T3.3-1	Quality audits	15/01/2022	15/07/2022	PCs	This task concerns the audits of the learning programs, which will allow the partners countries to analyze and evaluate the skills 4.0 transfer to the trainers and the students.	- **22** questions to evaluate the training - **5** specific questions per domain (Pilot) - **4** specific questions for the trainers - **14** indicators of Skills 4.0 transfer - **12** quality managers trained on QMS audit
T3.3-2	Quality audits implementation	15/01/2022	15/07/2022	PCs	Implementation of the Learning programs audits	- Number of audits per domain: **3** - Number of non- conformities: **NA** (the audits did not reveal any real non-conformity) - **12** Trainers on QMS Audit
T3.3-3	Quality audits analysis	15/01/2022	15/09/2022	PCs	Evaluation of the Impact indicators will allow the dissemination of the results with dedicated events in the Partners Countries	- Quality indicators analysis is completed (report) - % of the trainees are globally satisfied: ○ Pilot 1: **137** Students trained, **93.45%** of the respondents are globally satisfied

						○ Pilot 2: **142** students trained, **91%** of the respondents are globally satisfied ○ Pilot 3: **69** students trained, **92,6%** of the respondents are globally satisfied ○ Pilot 4: 50 students trained, **95%** of the students are globally satisfied
T3.3-4	Quality audits assessment	15/01/2021	15/07/2022	PCs	Assessment of the QMS system and continuous Improvement	- **1** Action plan for improvement is put in place per module - **1** improvement plan implemented per module
T3.3-5	Quality audits development	15/01/2021	15/07/2022	PCs	A campaign of audits, in a set of SMEs of the Partners Countries with impact indicators, will be conducted.	- Number of SME's involved: **13** - Number of companies salaries audited: **7** trainees from companies filled the quality questionnaires
T3.4-1	Sustainability assurance plan design	15/01/2021	15/07/2022	PCs	The sustainability assurance plan will be designed with all the HEIs partners and SMEs. The quality questionnaires for the trainers and the trainees are defined in the deliverable D3.2 The questionnaire for the SME's audit is define in the deliverable D3.3	- The sustainable assurance plan is completed - Number of SMEs consulted: **13** - The questionnaires have been developed and validated successfully: • **6** questions for the SMEs to evaluate the learning centers • **22** questions to evaluate the training (content & delivery) • **5** specific questions per domain (Pilot) • **4** specific questions for the trainers

T3.4-2	Sustainability assurance plan implementation	15/07/2020	15/07/2022	PCs	The training leaders will assess the indicators through a dedicated surveys in a set of SMEs of the Partners Countries.	- Number of SMEs surveyed in Partners Countries: **28** - Number of replies returned by Chinese companies: **5** - Number of replies returned by Malaysia companies: **8** - Number of replies returned by Thailand companies: **15**
T3.4-3	Sustainability assurance plan analysis & development	15/07/2020	15/07/2022	PCs	This sustainability plan will be developed towards the designated HEIs of the Partners Countries to ensure the continuation of this key activity beyond the end of the project.	- Number of companies globally satisfied by the Learning materials (per domain, per country): **82%** - Number of companies globally satisfied by the Learning Centers services (per domain, per country): **82%** - Number of SMEs that would recommend learning centers (per domain, per countries): **84%**

Changes that have occurred in this result since the previous approved report:

As we saw in the WP2, due to the Covid-19 pandemic, we asked for a 10-month extension of the project to be able to finalize the ToT sessions in face-to-face, as well as the students' training sessions. The development and validation of the Learning Centers was also delayed, from January 2022 to August 2022 (instead January 2021 to July 2021).
Because of that, some tasks of the WP3 were also delayed:

- Delay in the training of the trainers on Quality Management Systems and Audits
- Delay in the quality audit of the Learning Centers
- We have not been able to do a real quality audit of the Learning Centers because of the delays in their development, but we have prepared all the elements (indicators, evaluation forms, procedures...) so that these Learning Centers can be certified quality (ISO 9001) after some time of use by the users (students and companies).

TABLE OF ACHIEVED RESULTS

Title and reference number of the work package (WP)	**DISSEMINATION & EXPLOITATION (WP4)**

Indicators of achievement and or/performance as indicated in the project proposal	• Number of contacts based on the dissemination of the project • Number of scientific and technical publications • Number of publications and EU reports on Industry4.0's challenges • Number of events/activities per partner in the map • Number of Enterprise networks & professional associations involved

Activities carried out to date to achieve this result:

Activity N°	Activity Title	Start date	End date	Place	Description of the activity carried out	Specific and measurable indicators of achievement
T4.1-1	Dissemination and exploitation strategy	15/11/2018	14/02/2019	Italy	The objective of this task is to create the strategic plan for the diffusion and dissemination of the outputs of the project. Deliverable D4.1 – Strategic plan for diffusion and dissemination, includes the strategic plan for the diffusion and dissemination of the project and its results.	- The deliverable D4.1 is completed on time - Number of planned dissemination and exploitation activities is **30**.
T4.1-2	Dissemination and exploitation strategy - visibility	15/11/2018	30/11/2020	All	Visibility: identify a public/private entity where to make a presentation of the project.	- Number of entities where the project was presented: - UPM: **36** and UTM **85**; - The number of SMEs surveyed in "China" is: **95** - The number of SMEs surveyed in "Malaysia" is: **100** - The number of SMEs surveyed in "Thailand" is: **100**

						- The number of replies returned by Chinese companies is: **87** - The number of replies returned by Malaysia companies is **86** - The number of replies returned by Thailand companies is **92**
T4.1-3	Make a visibility/ dissemination map with locations and dates	01/01/2019	14/09/2022		Visibility/dissemination: identify with all partners a list of conferences, seminars, workshops for dissemination purposes.	- Number of events/activities per partner in the Map • France: **5** • Italy: **4** • Portugal: **3** • Thailand: **7** • China: **7** • Malaysia: **9** - Number of conferences is **20** - Number of formal and informal meeting is **54**
T4.2-1	Awareness dissemination and acceptance of emergent skills	15/03/2019	14/09/2022		The objective of this task is to create awareness in the university community and stakeholder for the acceptance of the industry 4.0 concepts and emerging skills 4.0. The aim is to launch awareness campaigns on current training programs and encourage the creation of similar initiatives in other HEIs in Asia and EU.	- Number of entities where the project was spread: • Domain 1: **22 entities in Thailand** • Domain 2: **12 entities in China** • Domain 3: **11 entities in Malaysia** • Domain 4: **8 entities in Malaysia** - Number of external universities identified to disseminate the project • Domain 1: **18 universities in Thailand** • Domain 2: **6 universities in China** • Domain 3: **7 universities in Malaysia** • Domain 4: **6 universities in Malaysia**

						- Number of external industries identified to disseminate the project: • ToT sessions: **9** • Seminars & Workshops: **20** • Industrial visits: **4** - Number of Shyfte proposed activities in universities: **5** seminars & exhibitions - Number of Shyfte proposed activities in industry: • **10** industrial workshops • Number of events where the project was spread: • **1** Keynote speaker in Int. conference • **1** Special session in Int. conference • **5** academic seminars - Number of conferences, formal, informal meetings…: • **20** international conferences • **10** physical Plenary or PMB meetings • **44** virtual Plenary or PMB meetings
T4.2-2	Awareness dissemination and acceptance of emergent skills presentation	15/03/2019	14/09/2022	All	Presentation of the idea of a possible COST (European Cooperation in Science and Technology) proposal aligned with the dissemination of the Centers of Excellence. Development of a COST (European Cooperation in Science and Technology)	- Number of awareness dissemination events: **47** - Number of partners involved: **37** other universities involved in the partners countries - Number of external entities involved: **33** - Number of Shyfte seminars & workshop: **20**

					proposal aligned with the dissemination of the Centers of Excellence; developed in the context of T2.5 task.	- Number of partners: more than **60** external partners involved - COST proposal acceptance: Collaboration with 3 EU projects: **(1) Erasmus+ Enhance, (2) Erasmus+ ETAT, and H2020 SME 4.0** - Number of initiatives argute to the COST: **3** seminars
T4.3-1	Exploitation and Dissemination for action	15/03/2019	14/09/2022		The purpose of this task is to bring the academic community closer to the industrial sector. As well as to define how best to exploit the skills framework and training programs developed within the framework of this project. Continuous dissemination of project achievements through other Asian and European HEIs will be carried out in order to reach a maximum of potential users. One of the main actions will be the creation, updating and management of the project website and social media profiles. Deliverable D4.2 – Project Website, documents the creation, updating and management of the project website and social media profiles.	- The deliverable D4.2 is completed on time - The deliverable D4.3 is completed on time - Number of leaflets: **6** - Number of Posters: **6** - Banners and buntings: **6** - The deliverable D4.4 is completed on time - Number of formal meetings **10** - Number of project virtual meetings: **44** - Number of workshops is **10** - Number of seminars is **5** <u>Events</u> - Number of events organized: **30** seminars, workshops, visits, meetings… - Number of events (conference, seminars, workshops…) in which Shyfte partners participate: more than **80** events (conferences, seminars…)

					Deliverable D4.3 – Publicity document, reports about leaflets, press releases, etc; and participation in social networks. Deliverable D4.4 – Formal and informal meetings, conferences, days, etc. documents specifically about: formal and informal meetings, international conferences, i.e. keynote speakers and papers; workshops and seminars; additionally it presents the scientific development team.	**Social Networks indicators** - Social networks number of follows: **106** followers on Facebook - Social networks number of likes: **98** likes on Facebook - Cluster of blogs indicators: **NA** (a technical problem did not allow us to measure the nb of visitors on the website since the beginning of the project). - Number of visitors: idem - Number of topics: around **18** topics covered - Number of posts: **35** posts published **Promotional videos and Medias** - **1** teaser to promote the shyfte center of excellence (4 learning centers) - **1** teaser per domain - **13** publications on Shyfte in institutional websites - **9** articles in medias (journal online and magazines, research exposition, news portals…¶) - **5** promotional videos (Youtube) - **19** participations in seminars, workshops, exhibitions, fairs...¶ (online / face-to-face)
T4.3-3	Website development	14/11/2018	15/03/2019	ULL / UNL / CDU	Development of a website, with requirements proposed by all partners.	- **1** main website for the project implemented
T4.3-4	Website extension	15/03/2019	14/09/2022	ULL UNL	Update current official website of SHYFTE. In the "Pilots" menu, four pilot's menu items will be linked to the local pilot.	**Website indicators** - Number of website visitors: **NA** (a technical problem did not allow us to

				CDU	Each pilot will provide a website to disseminate their excellent centre. In the website it is promoted a cluster of blogs. The blog function will be provided in each pilot, the skill sets which can be provided by each pilot will be listed in blog cluster.	measure the nb of visitors since the beginning of the project). - Average time on page: **NA** (a technical problem did not allow us to measure the nb of visitors since the beginning of the project). **<u>Cluster of blogs indicators</u>** - Cluster of blogs indicators: **NA** (a technical problem did not allow us to measure the nb of visitors on the website since the beginning of the project). - Number of visitors: idem - Number of topics: around **18** topics covered - Number of posts: **35** posts published
T4.4	Scientific and technical dissemination	15/03/2019	14/09/2022		The objective of this task is to achieve the greatest possible scientific dissemination. Technical and Scientific dissemination will be affected through international scientific journals, international conferences, workshops, etc. Deliverable D4.7 document reports scientific dissemination. Participation in indexed journals. Book publishing. Participation in national and international congress.	- The deliverable D4.7 is completed - Number of papers in scientific conferences (per domain): • Domain 1: **4** conferences • Domain 2: **5** conferences • Domain 3: **4** conferences • Domain 4: **4** conferences - Number of publications in international scientific journals (per domain) • Domain 1: **2** journals • Domain 2: **3** journals • Domain 3: **1** journal • Domain 4: **2** journals - Number of workshops & seminars organized: **15**

Changes that have occurred in this result since the previous approved report:

The tasks of WP4 concerning the dissemination and exploitation of the results went globally well, we were able to reach most of the objectives we had set ourselves.

- We have not been able to go as far as desired in the constitution of COST, but the collaboration with 3 other European projects will allow us to share some of our results and to consider future collaborations on the theme of Industry 4.0
- We also did not sufficiently disseminate our results on social networks, due to delays in the development of the Learning Centers (LC) and the training sessions, but we made sure that communication would continue after the end of the project so that the partner universities could sustain the use of the LCs, especially with companies. For that we developed Teasers for the LC and for each Pilot and we created a Youtube chanel to disseminate the outcomes of the project.

TABLE OF ACHIEVED RESULTS

Title and reference number of the work package (WP)	**MANAGEMENT: Project Management (WP5)**

Indicators of achievement and or/performance as indicated in the project proposal	• The assigned tasks start and finish on time • The project Handbook is defined and validated • The Quality Assurance Plan is defined and validated • The project meetings are scheduled • The minutes of the meetings are done and validated • The Quality Plan is defined • The periodic reports are done on time • The final report is ready on time

Activities carried out to date to achieve this result:

Activity N°	Activity Title	Start date	End date	Place	Description of the activity carried out	Specific and measurable indicators of achievement
T5.1 - 0	Project Management Coordination and Reporting	15/11/2018	14/09/2022	All	The objective of this task is to monitor the progress of the project: 1 PMB meeting per month or every 2 months (physical or virtual).	- **10** physical meetings (plenary and PMB) - **44** virtual meetings (plenary and PMB)
T5.1 - 1	Quality, Risk and Innovation Management	15/11/2018	15/03/2019	All	The D5.1 Deliverable: The project handbook defines and specifies the appropriate mechanisms and processes to be established in order to maintain a certain quality level in the whole project.	- The Handbook was finished on time (March 2019)
T5.1 - 2	Verify the progress of work according to the project time schedule, monitor resource usage, budget allocation.	15/11/2018	14/09/2022	All	At each project meeting we check the progress of each Work package and Tasks.	**Progress of work:** - All tasks are followed and finished on time (taking into account the extension of 10 months)

					The kickoff meeting was organized in January 2019 (from 21/01/2019 to 25/01/2019), the first tasks of the project have been postponed by two months because of that. A first version of all the deliverables have been finalized on time. At each physical/virtual project meeting (every month) the PMB and WP Leader monitor the resource usage and the budget allocation.	**Resource usage and Budget allocation:** - Timesheets were filled every month (per person and per category) - The financial statement was updated after each physical meeting - Travel receipts and expenses were collected after each physical meeting
T5.1 - 2	Manage conflicts by application of the foreseen procedures	15/11/2018	14/09/2022	All	Define quality procedures to manage conflicts between the project partners	- Quality procedures are defined in the handbook - Quality procedures are applied - **1** conflict identified and solved
T5.1 - 3	Development of management progress reports	15/11/2018	14/07/2020	All	D5.3 Deliverable: An intermediate report is provided comprising a description of the main results, potential impact and main dissemination activities. This report includes the differences between the work expected to be carried out and that actually done.	- A period of 2 months has been granted to fill the mid-term progress report due to Covid-19. - The progress report is complete and finished on time - The financial statement was filled and controlled on time → July 2020 - **9** deliverables are validated - The financial statement is ok
T5.1 - 4	Project Management Coordination and Reporting	15/11/2018	14/09/2022	All	D5.2 deliverable: The final report will be provided including a final publishable summary report	- The final report is well prepared and delivered on time → November 2022

					comprising a description of the main results, potential impact and main dissemination activities	-**24** deliverables are validated and delivered on time → November 2022 - The final financial statement is validated and delivered on time → November 2022
T5.2 - 1	Quality, Risk and Innovation Management: Quality control procedures	15/11/2018	14/09/2022	All	A section concerns the Quality Control procedures for producing project management, deliverables and document standards and templates is introduced in the handbook.	- **126 Quality Assurance Indicators** are measured: . WP1: **28** indicators . WP2: **32** indicators . WP3: **23** indicators . WP4: **32** indicators . WP5: **11** indicators - The **Quality Assurance Matrix** is followed: . Project schedule management plan is adhered to. - An External and Internal **Quality Evaluation system** is defined: . **14** PMB reports . **113** travel reports . **> 80 t**imesheets produced (per month, per person …) . **24** deliverables were delivered on time
T5.2 - 3	Quality, Risk and Innovation Management: Innovation monitoring	15/11/2018	14/09/2022	All	The monitoring of the innovation being developed through the project is described and the resolution of any issues and conflicts related to this.	The monitoring of the innovation developed is done regularly:

						- **4 Learning centers** are developed (one per Pilot) - **20 publications** in international conferences - **7 international journal** published and **2** submitted

Changes that have occurred in this result since the previous approved report:

The project proceeded in good conditions, the collaboration was perfect between the partners, each one having carried out the tasks and the coordination for which it was responsible. All tasks have been completed on time overall (considering the 10 months extension of the project).
The international pandemic did not allow us to continue in the same way the work initiated during the first part of the project (from Nov. 2018 to Jan. 2020). Physical meetings were no longer possible, which impacted and modified the way of managing the project (WP5), the organization of training sessions (WP2), the organization of dissemination events (WP4) ...
- 7 physical meetings (out of 17) were cancelled due to the Covid-19 crisis.
- A period of 2 months has been granted to fill the mid-term progress report due to Covid-19.
- An extension of 10 months of the project was accepted by the EACEA, the new official end date of the project was 14 September 2022
- One of the partner's, the company Cognitus, contributed to all the WPs and tasks assigned to it. The collaboration was fruitful because of Cognitus' expertise in computer technologies, and in particular, artificial intelligence, deep learning, machine learning, big data... This was a bit more difficult during the containment period related to the Covid-19 crisis. Cognitus continued to work and collaborate with the project members. But the company was affected by the health crisis and was forced to stop its activity in the project in July 2021 and could not continue to collaborate during the 10-month extension period of the project. We informed our PO about the situation, and we explained that the absence of this partner during the end of the project would not have an impact on the efficiency of the project.

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