DIGITAL TRANSFORMATION MANAGER

[DELIVERABLE TITLE]:

D.3.1. – The new Joint Curriculum of the Digital Transformation Manager
and
D3.2 - Report on effective training methodology
D3.3 - New curriculum and training methodology validation

[PROJECT WORK PACKAGE]:

WP3 – Digital Transformation Manager New Joint Curriculum

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CONTEXT

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Deliverable title	**D3.1. The new Joint Curriculum of the Digital Transformation Manager** **D3.2 Report on effective training methodology** **D3.3 - New curriculum and training methodology validation**
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Validated	Through online survey by 91 Experts

DOCUMENT CHANGE RECORD

Issue date	Version	Author	Sections affected / Change
02/10/2019	V0	Jeroen DOOM	draft version v0
29/10/2019	V1	Jeroen DOOM	1st draft version, distributed to all partners of WP3
02/06/2020	V2	Jeroen DOOM	2nd version, after discussion with partners WP5
29/06/2020	V3	Jeroen DOOM	Validated version with small changes
24/07/2020	V4	Jeroen DOOM	Validation results
08/02/2021	V5	Jeroen DOOM	Adaptation of number of training pills per Learning Unit, after the validation of all developed training pills (p.11, chapter 3.2, 3.3, 3.4 and 3.5)
24/11/2021	V6	Jeroen DOOM	Updates in chapter 2.2 and 4
06/12/2021	V7	Jeroen DOOM	With adaptation after last review from CENFIM and AMIC

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1   Introduction

The activities and deliveries of this WP3 are based on the outcomes and outputs of the WP2, which will deliver a report on tasks and subtasks, knowledge, skills, and competencies needs for the new occupational profile of the Digital Transformation Manager (D2.4).

IN WP2 we defined that the Digital Transformation Manager (DTM) is the professional, able to properly guide companies within the furniture sector towards their digital transformation. The DTM is the professional, that will plan, design, guide and check the implementation of the changes, needed by furniture companies, to transform themselves and adapt to the digital transformation.

Digital transformation is the profound and accelerating transformation of business activities, processes, competencies and models to fully leverage on the changes and opportunities of digital technologies and their impact across society in a strategic and prioritized way, with present and future shifts in mind. Digital transformation in the integrated and connected sense requires, among others, the transformation of:

- *Business activities/functions;*
- *Business processes;*
- *Business models;*
- *Business ecosystems;*
- *Business asset management;*
- *Organizational culture;*
- *Ecosystem and partnership models;*
- *Customer, worker and partner approaches.*

*By 2025, with a massively **connected and globalized economy**, the wood furniture manufacturing industry will offer **personalized smart products and services** based on **digital manufacturing, logistics and sales systems** supplied by **resource-efficient and sustainable industries** with an immense need for sufficient **digitization talents and skills** securing a competitive transformation of the industry.*

Based upon these outcomes of WP2, in WP3 we have defined the new joint curriculum related to the new occupational profile of the Digital Transformation Manager.

This joint curriculum must be consistent with the EU instruments for mobility and transparency ECVET, EQF and EQAVET and will include information and descriptions related to learning objectives and learning outcomes (LO's), a list of the learning units (training path) and the description of their content in relation to knowledge, skills and competencies (KSC's).

To have a real impact on the sector, the curriculum must be attractive for young people, in terms of content and career perspective.

ECVET points will be assigned for each unit (with the support of the ECVET toolkit).

In a next chapter, we make some recommendations about the most appropriate training and teaching methodology and instruments for each unit. We will also define the preferred requisites for the course participants to allow them to benefit the best from the course.

We defined the EQF level Qualification of the course, that is validated to be of level 5. This was be decided when the curriculum was finalized (M.28) and is based upon the developed learning pills (WP5).

We make recommendations for the certification, delivered to the students that successfully finalized the course.

Finally, several ESCO Furniture sector occupations will be affected in terms of knowledge and skills requirements by the digital transformation processes. The new joint curriculum for the Digital Transformation Manager will cover parts of these new skills needs. A report, analyzing the links among these occupations and the new tasks required, will support professionals with those ESCO occupations to increase their skills and knowledge and better face the challenges represented by the Industry 4.0 transformation.

This part will be described in D3.4 'Report for supporting furniture sector professionals with ESCO occupations affected by the digital transformation of the sector'.

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2 New Joint Curriculum for the Digital Transformation Manager (DTM)

2.1 Main principles of curriculum design

2.1.1 Why: Define the aims

What is de core of the newly defined job profile?

Is the context well described?

Are there different contexts possible?

2.1.2 What: develop and write Learning Outcomes, formulating goals and objectives

Goals and objectives are the heart of your content. Goals are broad statements describing what the learner should be able to do, once instruction is complete.

Objectives are more specific and outline how each goal will be met.

When writing goals and objectives you are doing backwards planning: thinking about the desired end results and then working backwards, creating steps to achieve these results.

2.1.3 Develop teaching activities and materials

There are many types of instruction to use. The key is to pick a teaching method that best suits our goals and objectives, adapted to the specified content.

Some examples:

- lecturing
- demonstration
- brainstorming / group discussions
- (group) work assignments
- cooperative learning and argumentation
- context base learning
- independent study
- …

2.1.4 How: design assessment and an assessment plan (SMART)

If you have designed measurable goals and objectives, the assessment plan should be fairly simple.

Assessing students may include demonstration of learned techniques as well as online tests or written or oral exams. Assessments don't need to be long or complex. When defining the assessment, we should define the criteria for the evaluation: what (KSCs)?, when?, how?, with which tools (tests, evaluation of practical work…)? …

2.1.5 Where: check alignment

Map the learning outcomes to the defined curriculum and to the defined new job profile. Are all compulsory KSC's integrated in the course(s)? Are there any gaps? Any optional elements?

2.1.6 Organize the course(s)

This is the practical implementation of the curriculum.

2.1.7 Revise, interpret and report findings

The evaluation of the curriculum is necessary to determine the extent to which the implementation of this curriculum has produced positive and suitable outcomes for all stakeholders (students, teachers and lecturers, educational institutes, firms, companies and organizations…). To evaluate curricular effectiveness, we must check if the defined content matches the learning outcomes.

The experiences, opinions and feedback from the students on the curriculum and the learning materials are essential to adjust and improve for next time. This information will enable to adapt the curriculum and/or the learning materials for further improvement and to stay relevant in these fast changing times.

2.2 Description

In WP2, we have defined **7 categories of skill sets**, relevant to digital transformation.

1. Technical skills (digitalization);
2. Innovation skills;
3. Communication skills;
4. Management, leadership and entrepreneurial skills;
5. Emotional intelligence skills;
6. Skills related to quality, risk and safety;
7. Ethics

The proposed curriculum is designed and set up considering that VET providers, as one of the two main target groups of this delivery, can use it as a (solid) basis for building up the desired new qualification.

Furthermore, the proposed curriculum is useful for employers, employees and all people willing to enter the labour market with the new qualification of DTM. The curriculum describes the role of a DTM with relevant information and gives a better view and understanding of the knowledge, skills and competences a DTM should gain to respond accurately to the labour market needs.

A revision of the new joint curriculum will take place after the implementation of the pilot course, taking into consideration the participants' feedbacks and comments, where the partners consider that the suggested changes improve the quality of this delivery.

Update: there were no comments nor new recommendations for adaptation of the proposed curriculum. Therefor, we can consider this curriculum as final.

2.3 Definition of the new Joint Curriculum content

In this WP, we agreed on the definition of the Learning Units and their content, based upon the outcomes of the results of the WP2 'Fine tune of the skills and knowledge needs of the sector'.

The layout of all the units will shape the specific training path for the DTM professional profile.

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Taking into consideration the European Qualification Framework we consider that this new joint curriculum will refer to level 5, considering that it will require at least:

- Comprehensive, specialized, factual and theoretical knowledge
- A comprehensive range of cognitive and practical skills
- Competences to exercise management and supervision in contexts of work or study activities where there is unpredictable change.

3 Definition of the Learning Units and their contents = What?

Learning Units are the 'What?'

Learning outcomes are described in relation to the specific knowledge, skills and competencies, in order to secure that the new joint curriculum properly matches the market and companies' needs. The training pills that will be developed within WP5 will further specify these specific learning outcomes.

Learning units and their contents.

Each Learning Unit of the curriculum is delivered in a comprehensive manner and in relation to other parts. This makes that the curriculum represents a coherent and appropriate Learning Path, which represents the ideal sequence of learning activities, that allows participants becoming proficient in the shortest possible time in the topic and properly complete the foreseen tasks by the related occupation.

But this proposed order and sequence is not compulsory. Each participants will be able to make in a flexible way his/her own learning path, based upon his/her own experience and interest area.

To make it a more comprehensive tool, the 11 defined technical skills are divided into four learning units, a first one on emerging technologies, a second one on engineering and digital manufacturing, a third one on digital technologies as virtualization and simulation and a last technical learning unit on data and cybersecurity.

The non-technical skills are organized in 6 learning units, one for each defined non-technical skills' set: innovation, leadership, communication, people, quality, risk and safety issues in a digital environment and a final unit on the social and environmental impact of digitization.

The following table shows the **Learning Units (LU)** of the course and its duration:

LEARNING UNITS (The duration of the Pills is approx. 45 min)	EQF 5 managers of furniture companies / HE in woodworking and furniture		EQF 4 workers of furniture companies / VET students in woodworking and furniture	
	Duration (h)	ECVET credits	Duration (h)	ECVET credits
Digital technology - Exploration of contemporary emerging and potential disruptive technologies	5,00	0,2	4,00	0,16
Digital technology - engineering and manufacturing	12,6	0,5	7,7	0,31
Digital technology – simulation and AR/VR	6,3	0,25	4,2	0,17
Digital technology – data & security	8,4	0,34	2,8	0,12
Innovation and digital transformation	7,7	0,31	4,2	0,17
Leadership in digital transformation	9	0,36	4,9	0,19
Communication in digital transformation	7	0,28	2,1	0,08
The people within the digital transformation	4,2	0,17	0,7	0,03
Quality, risk and safety in digital transformation	5,6	0,22	2,1	0,08
Social and environmental impact of digitization	4,2	0,17	2,8	0,11
DIGITAL TRANSFORMATION MANAGER	**70,00**	**2,80**	**35,50**	**1,42**

3.1 Learning Unit 1: Digital technology - exploration of contemporary emerging and potential disruptive technologies

- Internet of Things (IoT)
- Industrial Internet of Things (IIoT), framework for product development
- Cloud computing, enabler of Industry 4.0

(7)

3.2 Learning Unit 2: Digital technology – engineering and manufacturing

- Horizontal and vertical system integration
  - o Industry 4.0, concept and terminology (ERP, ORP…)
  - o Parametric design softwares for furniture industry 4.0
  - o From product design to production
- Additive manufacturing
- Autonomous robots

(18)

3.3 Learning Unit 3: Digital technology – simulation and AR/VR

- Simulation, digital twins, machining and virtual prototyping
- Virtual/Augmented reality: in design and in relation to AI

(9)

3.4 Learning Unit 4: Digital technology – data & security

- Data management and data-driven analytics
- Information Security Management & Cybersecurity (including blockchain)

(12)

3.5 Learning Unit 5: Innovation and digital transformation

- Disruption and (digital business) models and frameworks
- Innovation, creativity and ideas generation
- Business and IT strategy & alignment

(11)

3.6   Learning Unit 6: Leadership in digital transformation[1]

- Organizational structures and leadership
    - o Digital maturity models in the furniture industry
- Change management - strategy and culture
    - o Digital accelerators for digital adoption
- Process management, governance and management of digital assets
    - o Self-assessment, evaluation maturity tools and case studies

(13)

3.7   Learning Unit 7: Communication in digital transformation

- Engagement, transparency and accelerators adoption
- Partnerships
- Digital marketing

(10)

3.8   Learning Unit 8: The people within the digital transformation[2]

- Working in team: HR-practices in a digital environment
- Culture and mindset in a digital company

(6)

3.9   Learning Unit 9: Quality, risk and safety in digital transformation

- Quality: automation and standardization
- Implementing a digital strategy with regards to Risk and Safety
    - o From an analog safety management system to a digital system
    - o Risk management in the digital area

(8)

3.10   Learning Unit 10: Social and environmental impact of digitization[3]

- The Good, the Bad and the Ugly in a digital transformation process
- Digital tools in times of emergency
- Connecting sustainability with digitalization

(6)

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[1] Skilss set related to Leadership, but also to Entrepreneurial skills and management
[2] Skills set related to Emotional intelligence
[3] Skills set related to Ethics

4 Effective Teaching methodology and instruments = How?

The training methodology has been designed to be very intuitive and user friendly. The basic idea is that innovative and effective training methods must be used, such as online video materials, webinars, serious games, on-line educational games, etc…

Each learning pill has been developed using the most suited training method for that specific item and the learning outcomes that are aimed at in that specific learning pill. The preferential methodology and materials to be used (in function of the specific content/theme and aims of the training pill):

- Video material with interviews, statements, explanations from experts…
- Animated video or animated graphics, infographics
- Slides and learning objects
- Case studies
- Text, written explanation
- Recommended reading of articles, books, blogs…
- Exercises and/or self-evaluation

The methodology follows the principles and recommendations of andragogic methodologies, which are the methodologies recommended for adult education. These principles seek to increase the motivation of adult students and promote the transmission of knowledge.

1. **Principle of priority.** First impressions cut through more deeply than later ones. Therefore, you have to take care of the beginnings, causing a pleasant feeling that lasts.

2. **Principle of transfer**. Knowledge is extrapolated to new situations, if it is well established and well explained.

3. **Principle of novelty.** Novel facts, curiosities, and eye-catching insights are illustrative and entertaining.

4. **Principle of plurality.** In the learning process, different resources must be involved that impact the subject through different means, for the consolidation of an idea. For this reason, we have to address different senses, since, if something is perceived by the ear and by the sight, it will be better fixed.

5. **Principle of activity.** For there to be learning, the student has to carry out activities, starting from her own interests. It is essential to introduce the practice at the beginning, during and at the end of the explanation. The exercises are a way to liven up the class, to consolidate what has been

explained, and to give meaning in practice to what has been seen in theory. Teaching must be active, since the processes themselves have more interest than the result itself.

6. **Principle of participation.** Involving the student in decisions regarding the methods and dynamics of the course, maintaining the role of the trainer as a guide, allows people to feel protagonists from the beginning and assume their responsibility in training.

7. **Principle of self-esteem**. The person must consider himself capable of learning, the higher esteem he has of her abilities, the better he will learn and the more he will assimilate. Therefore, the trainer should encourage and praise the students.

8. **Principle of structuring.** The teaching-learning process must be structured. This order is established prior to delivery, and must be viewed as a whole, where the elements are related.

All these principles have been considered and applied in the creation of the learning materials and the online course to maximize the participation of students and that many of them succesfully finalice it and will find practical examples to apply on their deyliy work to become the Digital Transformation managers inside their respective organizations.

The Pilot training course will include **a final work**, to be delivered by the participants, which should cover a wide range of the units' content (choice out of 10) and to be linked to the practical work the participants are required to do within their company or other organization. Partners will provide students with clear information and guidelines about the format, content, aims and length of the practical work delivery. The final work will be produced in English by learners that will be supported during the process by a Technical Team, composed by different staff members among partners, based on their specific and complementary expertise. This same team will evaluate the works produced.

Update: the recommendations have been implemented in the MOOC, which is constructed of 100 micro learning pills, mostly with video materials and slides and with recommended extra reading material.

5 Participants = Who?

Definition of the target audience

The target audience is defined in two categories, with each two "levels". For each of these, we have defined a specific training path.

The training course is intended to be exploited by current and future employees within the furniture sector (managers and workers) and by current and future students, both VET- and higher education (HE) students in the domains of woodworking and furniture, ICT/digitization and/or innovation/product development.

These different groups might have a different level of interest for the different parts of the course, depending on their specific needs (for example as employees) and on their specific approach (for example as students).

The differentiation is relevant for our target groups, as it will support them to focus their attention and efforts on those parts of the course, that are the most relevant for their specific starting situation and their future work.

5.1 Professional workers

The complete program is designed for professionals from furniture companies, involved in business and IT-strategy setting, with the objective to create value out of a digital transformation of their businesses.

We think of CEO's, CIO's, IT-managers & directors, production managers, innovation managers, portfolio-, program- and project-managers, digital marketeers…

For this category, we've defined a complete training path, that includes all of the course pills. Here we are targeting companies' managers. Successful completion leads to a full DITRAMA DTM certification (situated at EQF level 5).

Within the category of working professionals, we also aim to the professionals on the work floor, who can benefit from the training courses.

For these professionals (on the work floor), we've defined a reduced training path, which consists of a specific selection of pills. Completion of this (reduced) training path leads to a partial DITRAMA DTM certification (situated at EQF level 4).

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5.2   Future workers

In the case of students, we made a differentiation between HE- and VET-students.

For HE-learners, we recommend the complete course training path, that leads to the full DITRAMA DTM certification (EQF 5).

For VET-learners, we defined a reduced training path, leading to a partial DITRAMA DTM certification (EQF 4).

In the Annexed table with the complete list of pills, we have identified which pills are relevant for each of the different target groups (differentiated training paths):

1) managers of furniture companies,
2) workers of furniture companies,
3) HE-students in woodworking and furniture and/or digitization or innovation,
4) VET-students in woodworking and furniture and/or digitization.

Practically, two training paths are defined: one for the target groups 1 and 3 (EQF level 5), and one for target groups 2 and 4 (EQF level 4).

6 Course declaration and Badges

Based on active participation in the course and after successful completion of the module assignments, each participant will receive an official declaration of 'Digital Transformation Manager: Digital technology – Engineering and Manufacturing'[4] of Erasmus+ DTM consortium'. It will be mutually recognized by the partners signatories of the DITRAMA Memorandum of Understanding, in spite of not being a certification officially recognized at national level.

For students that will successfully pass all the assessments for all the pills and modules (the path foreseen for HE learners and companies' managers in Annex 1) will get a title corresponding to EQF 5. While those students that will successfully pass all the assessments foreseen by the path for VET students and companies' workers (as specified in Annex 1) will get a title corresponding to EQF 4.

This declaration will be automatically provided by the DITRAMA learning platform to those learners that successfully passed all the integrated tests of the course learning pills.

The same learning platform will provide specific badges to those learners that successfully passed the tests of specific modules. These badges will also be mutually recognized by the partners signatories of the DITRAMA Memorandum of Understanding.

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[4] Or any other title of Learning Unit

7 Validation of the new curriculum and training methodology

*The new joint Curriculum will be validated through **the organization of national workshops***

They will analyze, revise and validate the proposed new joint curriculum and the proposed training methodology.

7.1 National workshops

National focus groups with job holders and firms

For this validation, we suggested to have national workshops and focus groups in all the countries involved. Therefore, WP3 leader WOODWIZE would provide a script to be used during this activity, in order to have consistent focus groups in all the countries. The focus groups could have been done in small groups (ca. 12 persons from different firms). The selection was suggested to be done at national level.

7.2 Adaptation due to Corona-pandemic crisis - COVID-19

The validation has be done through an online questionnaire, where the relevant actors and stakeholders (focus-group and/or experts' group) was be asked to answer online the questionnaire.

The members of **the sector-specific expertise group or focus group** were defined at national level, but should involve full and associated partners and sectorial representatives of formal and non-formal VET-providers, companies' associations, trade unions, VET regulatory bodies or labour officers, etc… They were invited with a personalized e-mail to join the online questionnaire (link).

No successful results without participants. The choice of the relevant stakeholders and actors is very important. For the project partners, we advised to personally contact these experts to achieve the desired participation. Be aware that they need some (minimal) time to carefully read the proposed questions. They will have to formulate their conclusions and suggest maybe some recommendations to improve the curriculum.

The number of participants was defined at minimum 12 per organizing country, with around 70% of the participants from enterprises and firms. It can be interesting to bring together people with different functions (HR, production, general managers ...). The heterogeneous composition of the group of participants must allow valuable insights from different perspectives (sub-sectors, company size, etc.). When selecting companies, you should consider a number of criteria that can increase the representativeness of the sample. Examples of selection criteria are:

- the nature of the activities (subsector)
- the region
- the size of the company (number of employees)
- the degree of innovation
- …

In addition to these participants, other experts from sector federations, trade unions, sectoral (training) funds, educational institutions, research institutes and so on should be invited to participate. Some possible actors, who could participate in the focus groups or experts' groups are:

- VET institutions with sector-relevant specialization (dual learning, school based learning, adult education, private training institutes)
- Sectoral training funds, where available
- Research institutions
- Labour market partners such as trade unions, employers organisations, umbrella organizations…
- Public employment services
- Regulatory bodies i.c. qualifications
- …

Our suggestion is to have a minimum of 12 participants per country (8 from sector companies) and 4 other experts

Throughout the validation period, these members of the focus group could consult and adapt their answers to our questionnaire until the defined deadline or until final submission of their answers and suggestions.

Finally, we integrated some extra questions on the proposed training offer and the further action plan of the DTM-project.

This way, we expected to gather useful contributions on the developed content of the new joint curriculum for the Digital Transformation Manager.

7.2.1 Questionnaire

The questionnaire was structured in such a way that a relatively large number of people received all relevant information in a relatively short time, without going through all project reports.

First and foremost, we wanted to summarize the most important and relevant developments and trends for the furniture sector, related to the digitization in the furniture sector. Therefore, we used the results of WP2 and the report of the Digit-Fur project. A link to these reports was provided. After this short introduction, the participants had a global idea of the current and future competence needs for the Digital Transformation Manager in the furniture sector.

Then the real questionnaire was set up: https://woodwize.typeform.com/to/ybrsiq

7.2.2 Timing

The online questionnaire was available from June 25th 2020 till July 8th 2020.

7.2.3 Participants

234 participants opened and started the questionnaire.

91 participants submitted their answers to the questionnaire. The average duration for filling in the questionnaire was 20 minutes.

Per country (89 answered this question)

- Italy : 12
- Spain : 12
- Denmark : 1
- Romania : 30
- Belgium : 13
- Poland : 1
- Czech Republic : 0
- Portugal : 11
- Other : 9 (FRA, USA, UK, SWE, The Netherlands)

Per professional expertise (88 answered this question)

- Furniture manufacturer (employer) : 21
- VET or HE professional : 20
- Industry 4.0 technology expert : 12
- Employee in furniture sector or member of relevant trade union : 11
- Full or Associated Project Partner : 9 10%
- Member of a (national) VET Regulatory body : 3
- Other : 12

7.2.4 Reporting and results

As the validation was done by an online questionnaire, the results obtained were automatically summarized. A summary of this results is included in the annexes of this report.

Some experts suggest extra or other Learning Units and learning content, such as:

- Artificial intelligence is not addressed with emphasis. Integration of AI in quality of production and business development.
- Chain optimization, smart and digital logistic management
- New type of Learning: continual, experiential and explanatory
- Empathy - design for different cultures
- Organisations with growth mindset
- Digital communication and cooperation between stakeholders
- Team building and Re-/Up-skilling of staff members in DT (covered in change management?). Learning sessions about digital transformations for the manufacturing manpower(soft and hard made skills)
- Learn governments to help this process; relationship between business area and government
- Some about the European Green Deal like a new growth strategy that aims to transform the EU into a fair and prosperous society
- How to use in a smart way the Cobots and Industrial Robots
- Innovative Supply Chain Finance

For the suggested content of "prototype conception; design and concept personalized furniture; design for fabrication…", we suggest to look at the Erasmus+ SSA project EQWOOD (www.eqwood.org), where these themes are addressed.

An interesting suggestion is to incorporate an "Assessment of the industry digital literacy and a Roadmap from analog to digital". This way, the students understand the importance of the digital transformation in the furniture industry. It would be interesting to start with some overview of the as-is situation: at which starting point are most of the furniture companies regarding digitalisation and automation? Then it should be useful to describe the necessary steps from this as-is situation to a future digitalisation. It is also important to explain the challenges and the benefits of the digitalisation. Which are the parameters that can contribute to a successful company, how to control the parameters (how to collect the information

from the workflow, how to use this information and how the digitalisation can help).

On the question of the proposed EQF level, to which this curriculum refers to is EQF Level 5, nearly 96% answered YES (88 responses) and only 4% answered NO (4 responses). 3 think EQF 4 is better suited, one thinks EQF level 6 is more appropriate for this curriculum

Finally, we received following general comments on the proposed curriculum:

- The defined Learning Units seem to cover all the major issues.
- No comments in particular, but I would emphasise the soft skills required to enable him/her to engage all the players inside or outside the organisation. Also, I don't see anywhere mentioned the need for the DTM to master the English language. I would personally consider this a mandatory requirement.
- The learning units are suitable, global and holistic well integrated.
- I like the distribution of 6 soft skills and 4 technical ones, for quite often the soft ones are the real game changers
- Seems a quite complete curriculum
- Recognize technology as a moving target and help the organization to adapt to the infrastructure of the future, as motivation for the Learning Units.
- It is very important to well know the complete information about the technological process of manufacturing furniture, when it comes to graduate and step into your new profession: wood industry/ wood engineering/ furniture manufacturing sector.
- Thank you very much for the initiative
- Really interesting joint curriculum. Well done.

The main objectives were to have a **validation** of the new joint **curriculum for the Digital Transformation Manager**.

The proposed joint curriculum has been validated by 91 experts, through this online survey.

Final conclusion:

The new joint Curriculum is validated.

8 Preparation of the report on ESCO Occupations affected by the sector digital transformation

Based on D2.2 workshop working document, the outcomes and results of the D2.3 Workshop and the related report D2.4, P3 WOODWIZE will prepare a Report on ESCO Occupations affected by the sector digital transformation.

P3 will be supported in this task by the other VET providers and Higher Education Institutes.

This document will focus about those ESCO occupations of the furniture sector that will require an update of the knowledge and skills needs, in relation to the new tasks required by the companies' digital transformation.

9 ANNEX: List of Learning Units and Pills

	Title Learning Unit	Title Chapter within LEARNING UNIT	Name of Pills
1	**Digital technology - Exploration of contemporary emerging and potential disruptive technologies**		
		Internet of Things (IoT)	Internet of Things - Emergence of Connected Economics
		Industrial Internet of Things (IIoT), framework for product development	What is IoT/IIoT? General approach and platforms
			IoT framework - Case study Tapio (HOMAG)
			Digital product configuration, selling, buying from a single platform (pCon)
			Case study of One Two Time and Job registration by barcode scanning
		Cloud computing, enabler of Industry 4.0	Cloud Computing – Enabling Industries of the Future
			Cloud computing explained in the context of Industry 4.0
2	**Digital technology - engineering and manufacturing**		
		Horizontal and vertical system integration	Technical General Competences
			Horizontal and Vertical System Integration
		Industry 4.0: concept and terminology (ERP, ORP...)	A brief history on the first, second and third industrial revolution
			Industry 4.0
			ERP Introduction
			Case study of Proteus® ERP
			Operational Resource Planning Case study - ARDIS®
		Parametric design softwares for furniture industry 4.0	Review of parametric design software for Industry 4.0
			Case study: Imos as customized design software
			Case study: Inventor software (applied in Nord Arin S.A Co.)
		From product design to production	CADCAM Case study -TopSolid
			CAD-CAM system Industry 4.0 Case study - Cabinet Vision
			CAD-CAM Case study - bCabinet (Biesse)
		Additive manufacturing	Additive Manufacturing Introduction
			Additive Manufacturing Overview
			Additive Manufacturing Examples from the furniture sector
		Autonomous robots	Autonomous Robots - An Introduction
			Autonomous robots - Case study: Lesta robots for furniture finishing

3	Digital technology – simulation and AR/VR		
		Simulation, digital twins, machining and virtual prototyping	Establishing Digital Twins for Cyber-Physical Systems
			Case study - bSolid (Biesse)
			CAD-CAM-CAE - Sophia platform
		Virtual/Augmented reality: in design and in relation to AI	Visualization of the design
			Augmented Reality & Artificial Intelligence
			Augmented Reality - General concepts and applications
			Case study - design pCon digital platform
			Using AR/VR in sales
			Remote technician and operator training by AR/VR
4	Digital technology – data & security		
		Data management and data-driven analytics	New ways of collecting and moving data - digital platforms
			Tools for Understanding and Monetizing Data
			Big Data analytics & advanced analytics
			LEAN and Digital Manufacturing "Total Production Maintenance" TPM
			LEAN and Digital Manufacturing SMED
		Information Security Management & Cybersecurity (including Blockchain)	Big data analytics and evaluation of customer experience
			Cybersecurity Introduction – backing up your data might not be enough
			A strategy for cybersecurity: how to protect your digital assets
			Cybersecurity (internally in the firm)
			GDPR and Safety - General Data Protection Regulation
			Blockchain - a changing trend for industries and what does it mean for your business
			Machine Learning in the furniture industry
5	Innovation and digital transformation		
		Disruption and (digital) business models and frameworks	Understanding the Digital Ecosystem
			Managing innovation processes and tools to drive digitalization
		Innovation, creativity and ideas generation	Ability to sense the opportunities within digitalization
			New (Digital) Business Models
			Value generation
		Business and IT strategy & alignment	Introduction to Digital Transformation
			What is Digital Maturity ?
			Designing the Digital Strategy
			Moving from Supply Chain to Ecosystems
			Moving from Products to Services: New Value Propositions
			Understanding the Market / Technical Trend and the Competition to Fit in the Digital Ecosystem

6 Leadership in digital transformation			
	Organizational structures and leadership	Investing for Digital Transformation: The Business Case	
	Digital maturity models in the furniture industry	Related to business concepts (i.e. investments)	
		Leveraging Maturity Models to promote Digital Transformation in the Furniture Industry	
	Change management - strategy and culture	Digital Adoption: What, why and how	
	Digital accelerators for digital adoption	Strategy, Organizational Culture and People	
		Underpinning execution: ICT, standards and processes	
		Reorienting the company around the Customer Experience to generate business value	
		Embracing constant change and rapid adaptation to generate business value	
		Examples of Digital Transformation Enablers and Tools	
	Process management, governance and management of digital assets	Self-assessment exploratory questions	
	Self-assessment, evaluation maturity tools and case studies	Evaluation Tools - How digitally mature is your company?	
		Furniture Manufacturing Industry: Current Status	
		Advancement of the Digital Maturity of Furniture Manufacturing Companies	
7 Communication in digital transformation			
	Engagement, transparency and accelerators adoption	Digitalization: Opportunity or Threat	
		Communicating the Digital Change in the Company	
	Partnerships	How to create partnerships in a digital ecosystem	
		LEAN and Digital enabled Supply Chain/Logistic	
	Digital marketing	The Financial Perspective for Digital Commerce	
		Delivering Digital versions of the furniture/products (e-commerce) - Intro	
		New customer touch points	
		E-marketing and (mobile) branding	
		How to understand "your" market	
		Brands & Patents - Intellectual Property Rights	
8 The people within the digital transformation			
	Working in team: HR-practices in a digital environment	Digital HR Practices	
		Getting the right Employees: Hiring & training	
	Culture and mindset in a digital company	Assessing the need for organizational change	
		Managing the organizational change	
		Change of Culture and Mindset in the Company	
		Change of culture and mindset in the company. Case study - Van Hoecke	

9	**Quality, risk and safety in digital transformation**	
	Quality: automation and standardization	Automating tasks performed by human vision - Case study: TrackTech
	Implementing a digital strategy with regards to Risk and Safety	Digitalization of Organizational Processes
	From an analog safety management system to a digital system	From an Analog Safety Management System to a Digital System?
		Ecosystems and transactions: security implications
	Risk management in the digital area	Intro to Risk management in the Digital area
		A vision for the Digital risk: the seven building blocks
		Implementing a Digital Strategy with Respect to Safety
		Prevention Policy, Risk Assessment
10	**Social and environmental impact of digitization**	
	The Good, the Bad and the Ugly in a digital transformation process	Digital Transformation - The Good, Bad & Ugly
	Digital tools in times of emergency (i.e. healthcare, COVID-19)	Digital tools in times of emergency - Covid 19
		Digital tools in times of emergency - Covid 19 (part 2)
	Connecting sustainability with digitalization	Connecting Sustainability with Digitalization
		How 'servitization' facilitates for longer lifetime of products
		Full cycle reusability of the Products

DITRAMA PROJECT INFO

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Project title	**Digital Transformation Manager**: leading companies in Furniture value chain to implement their digital transformation strategy
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Project duration	36 months

PROJECT CONSORTIUM

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