DIGITAL TRANSFORMATION MANAGER

[DELIVERABLE TITLE]:

SUMMARY REPORT

D.3.1. – The new Joint Curriculum of the Digital Transformation Manager
D3.2 - Report on effective training methodology
D3.3 - New curriculum and training methodology validation
Version 6 – FINAL VERSION

[PROJECT WORK PACKAGE]:

WP3 – Digital Transformation Manager New Joint Curriculum

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CONTEXT

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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

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TABLE OF CONTENTS

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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'.

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

2.1 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. Therefore, we can consider this curriculum as final.

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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 le arning 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:

	EQF 5 managers of furniture companies / HE in woodworking and furniture		**EQF 4** workers of furniture companies / VET students in woodworking and furniture	
LEARNING UNITS (The duration of the Pills is approx. 45 min)	**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**

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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
  - Industry 4.0, concept and terminology (ERP, ORP…)
  - Parametric design softwares for furniture industry 4.0
  - 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
  - Digital maturity models in the furniture industry
- Change management - strategy and culture
  - Digital accelerators for digital adoption
- Process management, governance and management of digital assets
  - 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
  - From an analog safety management system to a digital system
  - 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)

[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 bene 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.

These recommendations has 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).

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.

[4] Or any other title of Learning Unit

7 ANNEX 1 / 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

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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

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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

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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 CONSORTIUM

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