

# D 4.3 - Revision of Skills4Smart TCLF 2030 curricula

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accord a



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## Introduction

Working Package 4 is the package is dedicated to the development of the training curricula. The WP has several objectives, in short : (1) developing new innovative curricula to tackle specific TCLF sector urgent training needs; (2) developing modular curricula for circular economy and digital upskilling and re-skilling the labour; (3) defining curricula standard (micro-credentials) facilitating the measures for the formal recognition of the new or adapted vocational VET an HE curricula and qualifications; (4) facilitating the upskilling/reskilling process through a scanning skills balance to create their training itinerary (tailored courses).

More specifically, Task 4.4 "Update Skills4Smart TCLF 2030 curricula" is focused on the analysis of the 8 Curricula developed in the Skills4Smart TCLF project, to see if they have been touched - and how - by the updates that emerged from the mapping activity performed in WP 3.

Therefore, this report aims at offering insights and observation about the contents of the S4TCLF curricula, underling which parts of them need an update and why.

#### Partners involved

The Consortium decided to involve in this activity only a group of technical and specialized partners, consequently, the following partners contributed to the evaluation of the S4TCLF curricula:

- COTANCE
- EURATEX
- ATP
- SPIN 360
- CEC
- LCB
- CNDIPT
- HCIA
- CONFINDUSTRIA MODA
- ITECH
- BORASJ COMMUNITY
- ŁUKASIEWICZ ŁIT

#### **Templates and Materials**

Politecnico Calzaturiero, the Task Coordinator, provided to each partner involved a set of document in order to formalize the evaluation process.

The first document was a Curricula Evaluation Form, personalized for each one of the S4TCLF Curricula (in total, 8 Evaluation Forms were provided).





SKILLS4SMART CURRICULA EVALUATION FORM	Document title
TEXTILE TECHNOLOGYST	
<ol> <li>Evaluate the following job-related skills and competences.</li> <li>Do they reflect the state of the sector?</li> <li>Are they still valid, given the state of the sector?</li> <li>Are the still valid considering the demands of the sector?</li> </ol>	
C1. Demonstrate a deep understanding on fibres, yarns and fabrics (non-woven, woven, knitted and tufted fabric), their characteristics, properties, costs and their life rcle to conceive processing of fibres/filaments into yarns, and manufacturing of all types of textile fabrics in order to satisfy the fashion market needs, the company rategies and the environmental impacts.	
SC2. Apply the knowledge related to the quality control system and protocols for the raw materials and textile products. Apply textile metrology and st to supervise the measurement, control/evaluation and testing processes for the textile structures.	andards, being able
SC3. Plan, conduct, coordinate and monitor the spinning process and assure it is carried out in a consistent manner and in accordance with speci knowledge related to spinning (including braiding) production process using modern technologies for the development of the products. Understand digital technologies. Implement new processes and/or optimise the active ones to improve the quality of the process and products, to achieve cost effici the environmental impact in the different phases of the process.	fications. Apply the I the new emerging iency and to reduce
SC4. Plan, conduct, coordinate and monitor the weaving process and assure that it is carried out in a consistent manner and in accordance with spec knowledge related to weaving production process using modern technologies for the development of the products. Understand the new emerging of	ifications Apply the digital technologies.
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Fig. 1: First page od the Curricula Evaluation Form

The Curricula Evaluation Form was divided into 3 sections:

- 1. Evalutation of the job-related skills and competences presented by each curricula (the objective was to evaluate if the skills and competences still reflect the current state of the sector, if they are still valid and if they are in line with the current demand of the sector).
- 2. Evaluation of the Training Unit considering the learning outcomes and the structure (sub-units and contents).
- 3. Evaluation of a given list of skills and knowledge to observe if they could integrate the ones already present withtin the curricula.

The second document given to the partnes was a Short Report Template, which reflects the structure of the current report, in order to sum up the main findings retrieved using the Curricula Evaluation Form. Also in this case, the Short Report Template was divided into three sections:

- 1. Part I: Evaluation of the job-related skills and competences.
- 2. Part II: Evalutation of the skills and kowledges of the previous curricula
- 3. Part III: Connection with the new Skills and Knowledge





META SKILLS	
Short Repor	t Template
Introduction	
This report aims at summariz evaluation. The objective is to gather the curricula and formalize it.	ing the main findings of the SkillsforSmart TCLF Project curricula
This report should not be longe the previous developed curricu in the new curricula could be	er than 2 pages, the main result to achieve is to understand if and how la could be improved and if the new skills and knowledges proposed update coherent with the market demands.
PART I : Evaluation o	f the job-related skills and competences.
Do the job-related skills and or state of the sector? If not, why.	mpetences present in the previous project well respond to the current
is the job and skills demand com if not, why?	ing from the industry well represented by these skills and competences?
PART II : Evalutation curricula	n of the skills and kowledges of the previous
Are the Skills and Knowledge (i market requests? If not, which (	both units and sub-units) still valid in your opinion and coherent with the of them? And why?
Are there some contents of the	sub-united that need to be updated? If yes, which of them?
PART III: connection	with the new Skills and Knowledge
Which of the suggested skills ar Why?	nd knowledge could Improve the ones present in the previous prohjecy?
Do the proposed Skills and Kno them?	wledge well respond to the needs of the labour market? If yes, which of
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Fig. 2: Short Report Template first page





## Evaluation of the job-related skills and competences

In this first part, there is the evaluation of the job-related skills and competences present in S4TCLF Curricula, with the aim of observing if they still well respond to the current state of the sector, and if they still well represent the skills demands coming from the TCLF industries.

#### **TEXTILE TECHNOLOGIST**

The evaluation of the Textile Technologist Curricula was conducted by the Municipality of Boras and by ITECH – Lyon. Both partners believe that the skills and competences presented in the curricula still well repond to the current state of the textile industry. In particular, they underlined the relevance of

- **SC1:** Demonstrate a deep understanding on fibres, yarns and fabrics (non-woven, woven, knitted and tufted fabric), their characteristics, properties, costs and their life cycle to conceive processing of fibres/filaments into yarns, and manufacturing of all types of textile fabrics in order to satisfy the fashion market needs, the company strategies and the environmental impacts.
- **SC8**: Suggest, plan and monitor the finishing treatments to assure the quality of the textile process and product. Apply the knowledge related to chemical and mechanical finishing processes (including dyeing, finishes, printing, digital printing etc.) based on modern technologies for the development of the products, including the innovative treatments.

However, as the Municipality of Borash emphasized the role played by sustainability and innovation, and the consequent need of a stronger focus on integrating advanced digital tools and eco-friendly processes, which might be necessary to stay relevant, at least in the Swedish context.

Moreover, both partners believe that the Skills and Knowledge (both units and sub-units) presented by the curricula are still valid with the market request; even if the Municipality of Boras underlined that, at the national level and in the context of Boras Textilhögskola, topics such as advanced recycling technologies and lifecycle analysis of textile products could be expanded to better reflect local expertise and priorities.

When asked if some contents of the sub-united needs to be updated, both partners indicated a list of them and suggested some possibile correction:

- **UL01**: Incorporate updated statistics on global fiber production and environmental impacts specific to the Nordic region (Mun. of Boras). It could also be interesting to add some key-figures on world fibre production, market and LCA (ITECH).
- **UL03**: it should be included advanced automated texturing and covering processes (Mun. of Boras), as well as texturing and covering processes (ITECH).
- **UL04**: it could be added an introduction of the main woven structures (plain, twill, satin...) (ITECH).
- **UL05**: it should be added an introduction of the main weft knitted structures (jersey, interlock, as it is done in warp knitting sub-units (ITECH).
- **UL08**: It should be more emphasized the environmental impacts of specific finishing treatments and chemical products, such as water-saving dyeing methods and renewable energy integration





(LIT). In this unit, It is not clear whether the term "processes", which seems to include both technologies, machines and formulations in dyeing, printing and coating. If not, it would be helpful to complete (Mun. of Boras).

A new set of skills and knowledge was proposed and it was asked to the partners which of them could improve the ones already present in the previous curricula, as well as which of the new ones well respond to the needs of the labour market.

The partners responded that, in general, it is important to be aware of the technologies and processes currently used throughout the textile sector, but also to take into account the changing needs and demand in relation to sustainability and the reduction of environmental impact throughout the textile supply chain. The Municipality of Boras underlinded that proposed updates, especially those focusing on sustainable materials, eco-friendly technologies, and digital transformation, are in high demand in the Swedish labor market.

They also reflected upon the following skills and knowledge:

- **CE\_MC11 and CE\_MC12:** These micro-credits could improve those presented in "textile technologyst" because we know that the transformation of raw materials and finishing treatments are the two stages of the textile chain with the most negative environmental impact (ITECH). Moreover, they could greatly enhance the curriculum by addressing Sweden's leadership in environmental standards for the textile industry (Mun. of Boras).
- **DF\_MC11**: Digital solutions for efficiency and sustainability should be prioritized, considering Sweden's push for Industry 4.0 integration (Mun. of Boras).
- **DF\_MC12:** Technological transfer and advanced data management align with Sweden's innovative textile initiatives and can strengthen local competitiveness (Mun. of Boras).

Nonetheless, according to ITECH, it would be useful to know which sustainable materials minimize the negative impact on the environment through life cycle analysises and to have skills also in recyclability and circularity of textile materials. An approach on BAT (Best Available Techniques) and innovative eco-friendly dyeing and finishing technologies would also improve this curricula.

Finally, regarding the training needs of the labor market, ITECH observed that, currently, the market needs people who are familiar with the technologies present in all stages of textile manufacturing, from the raw material to the finished product. The future workers need to know the environmentally friendly materials and treatments, to be able to decide to change for eco-friendly processes and to promote dyeing and finishing machines with low water and energy consumption is already part of the daily life of textile companies. This is why:

- CE\_MC11 and CE\_MC12 well respond to the needs of the labour textile market.
- **DF\_MC11**, about digital solutions, seems to be also essential in the near future to improve the development of textile industry, having better efficiency and substainability.
- **DF\_MC12**, about technological transfer and data management, is also relevant, since it exposes the ability to identify, critically analyse emerging technologies and adapt them to specific needs





must also be taken into account. In summary, all the skills and knowledge in the table well respond to the needs of textile industry.

#### **CLOTHING PATTERN MAKER**

The evaluation of the Textile Technologist Curricula was conducted by EURATEX, which observed that the job-related skills and competences present in this Curricula only partially respond to the current state of the clothing sector.

Indeed, while the skills remain relevant, there is a lack emphasis about sustainability, digitalisation, and emerging technologies such as AI, blockchain, and IoT, which are critical in the current state of the sector.

Moreover, they emphasised that the job and skills demand coming from the industry is not completely well represented by these skills and competences, since the industry's demand for advanced tools in virtual prototyping, sustainable practices, and traceability systems is not sufficiently represented. Consequently, these gaps limit alignment with modern production processes and market requirements.

Moving foreward, when cosidering if the Skills and Knowledge (both units and sub-units) of the curricula are still valid and coherent with the market requests, EURATEX believes that the foundational knowledge and skills of the curricula remain still valid. However, certain sub-units require updates, specifically:

- **ULO1:** it would be important to add AI and digital collaboration tools.
- ULO2: circular textiles processes, recycled fibres and smart textiles need to be integrated.
- **ULO3:** it needs to be deepened and to include waste-reduction techniques.
- **ULO4:** it necessary to be update with the inclusion of VR and AI-enhanced simulations.
- ULO5: traceability systems should be included.

Further, EURATEX reflected on which new skills and knowledge could improve the ones present in the previous curricula, and it identified the following groups:

- **CE\_MC13:** it is important for enhancing sustainability-focused design and for addressing industry needs for eco-friendly garments.
- **CE\_MC14**: it would be important to be included, since it contributes to improves digital workflows and introduces tools for trend forecasting.
- **DF\_MC13:** it is pivotal to introduce skills and knowledge about sustainable clothing production processes since they align with circular economy goals and waste reduction.
- **DF\_MC14:** it would be important to include in training the focus on wearable technology and customisation, since it reflects emerging markets for e-textiles and technology integration.

More in general, EURATEX observed that the proposed skills and knowledge well align with market needs by addressing sustainability through eco-design and production modules, by strengthening digital capabilities with advanced design and prototyping techniques and by opening innovation opportunities in wearable technology.





#### **3D CAD FOOTWEAR DEVELOPER**

The evaluation of the 3D CAD Fottwear Developer Curricula was conducted by Łukasiewicz – ŁIT.

LIT observed that the job-related skills and competences present in the curricula still well respond to the current state of the footwear sector, especially they underlined the importance of:

- **ULO 1 Footwear product design and styling process:** this unit is still relevant since it offers knowledge about the fottwear fashion trends. Marketing competetion and management of a footwear design process; moreover it support the development of skills related to the selection of interpretation of fashion models, identification of new target markers and application of footwear collection plan.
- ULO 6 CAD 2D/3D Soles and Heels: this unit is still relevant since it offers a very technical knowledge about the components of footwear and thei translation into 3D CAD models, as well as pattern gradinf and moulds for soles and heel; moreover it support the development of skills related to the analysis of strucutres, the use of CAD softwares for soles, heels and the identification of the different footwear contruction.

Also, ŁIT believes that the job and skills demand coming from the footwear industry is still well represented by these skills and competences. Even if there is a growing awareness of the necessity for companies to improve the quality of their communication; and, from the techical part, an increasing interest for IA technologies and innovations.

When asked if the skills and knowledge (both units and sub-units) are still valid and coherent with the market requests, the partner expressed its concern since, on the one hand, it recognized the importance of the skills and knowledge presented for preparing specialized technician; however, on the other hand, it stressed the difficulty to engourage student to porsue this kind of training.

LIT underlined how often VET Centers or, more in general, training entities do not have modernized equipment, tools and programs to be adapted to modern need. Thus, it becomes pivotal to support the training of this curricula with modern learning methods and innovative tools which could be viable for all training centers across Europe.

Regarding the new suggested skills and knowledge, the partner stressed the importance of increasing attention on the topics related to eco design. Since, today, the green transformation is key and it concerns the entire fashion sector and ability to adapt to this is very important. LIT also observed the importance of paying attention to AI technology, which is becoming more and more popular. It is worth considering how to learn to use it correctly in the fashion sector, so that it does not replace the creativity of designers, trend analysts or project managers.

Finally, regarding the training needs of the labor market, ŁIT emphasized the labor market's need for wellqualified employees in the field of digitalization of production processes. Thus, it is foundamental to traing appropriate design personnel who can be familiar with various design and 3D prototyping techniques. There is also a demand for specialists in trend analysis, marketing, and e-commerce.





#### LEATHER TECHNOLOGIST

The evaluation of the Leather Technologist Curricula was conducted by COTANCE and Leather Cluster Barcelona - LCB.

COTANCE observed that the job-related skills and competences present in this Curricula well align with the current state of the sector, especially in terms of leather production, general chemical management, and main environmental considerations.

The partner recognized that the skills demand coming from the leather industry was well represented, especially in terms of industry's demand for sustainable practices, quality control, and knowledge of leather processing. However, more emphasis on current regulatory and market traceability requirements and digital skills could enhance alignment with upcoming industry needs.

Moreover, when asked if the Skills and Knowledge (both units and sub-units) were still valid, COTANCE observed that most of the skills and knowledge presented in the curricula are still valid, but there is the necessity to expand them in order to include some pivotal issues regarding the sector, including:

- Content related to IED-related clean technologies and circular economy practices
- Knowledge of the upcoming regulations in leather waste management based on those applicable to textiles.

LCB also identified the sub-units which need to be updated:

- **ULO 1**: both the skills and knowledge presented in this ULO are still valide, however there are missing points, especially when dealing with the chapter about Operations of the leather processing chain and about Operations of the leather processing chain we would add and highlight the failures that may arise, to talk about each failure for each operation, apart from dealing with the future possibilities of one failure in the process.
- **ULO 2**: the sub-unit titled Clean technologies in tanneries should be verified to ensure they include the latest BAT (Best Available Techniques) under the Industrial Emissions Directive and focus more on sustainability and REACH restrictions regulations.
- **ULO 6**: this training unit should be deepened, especially when dealing with the Technical characteristics and requirement of leather for different usages, taking in consideration the characteristics of leather. It would be also interesting to insert a remark about leather's biodegrability, versus other products that we may find, as plastic.

Finally, regarding the training needs of the labor market, the partners underlined the key characterstics of the skills and knowledge that should be added:

• **CE\_MC15:** it emphasised the importance of understading the stages of leather production and consumption and how the contribute to waste generation; the recognition of the different types of leather waste and their environmental impacts; the assessment of the environmental impacts of various textile and leather production processes; and the evaluation of the environmental consequences and economic implications of leather waste within the industry.





- **CE\_MC16:** in particular the partner recognized the importance of developing the ability to differentiate between various impacts of leather production on carbon footprint; to assess the significance of leather labels; and to understand the interdependencies between meat/dairy industry and hide production.
- **DF\_MC15:** COTANCE underlined the importance of developing the ability to consider digital tools for improvement of leather processing (economic and sustainability impact); to develop skills in planning, monitoring, and optimizing production processes; and to understand Pros and Cons of Digitalization in leather processing, alternative measures.
- **DF\_MC16:** the partner recognized the importance of aknowledging how to describe the principles of Technological Transfer; the ability to recognize the importance of data management in optimizing leather production processes and supporting decision making; and to apply technological advancements to improve efficiency, productivity, and sustainability in leather manufacturing.

#### SUPPLY CHAIN ANALYST

The evaluation of the Supply Chain Analyst Curricula was conducted by the Hellenic Clothing Industry Association - HCIA.

After analysing the curricula, the partner believed that the skills presented in the ULOs sufficiently correspond to the knowledge currently required in TCLF companies. There are a up-to-date, complete and coherent set of both soft and hard skills and competences.

Parhaps the job-related skills and competences presented in the curricula which better respond to the current state of the sector is **SC8** - Demonstrate digital skills by operating various software applications and systems for supply chain management in order to plan and track the movement of materials and products inside and outside the company.

Regarding the job and skills demand coming from the industry HCIA believe that it is well represented by the skills and competences proposed, especially for the specific field of operation. Indeed, the topics are meeting the industry demands sufficiently, even if there is a need for more focus on AI and other technologies, KPIs for monitoring and real-life cases., in order to be future ready, in a sector that is already and will be even more influenced by the new digital environment.

When analysing the units and the sub-units, the partner confirmed that, in general, they are complete, but it could be interesting to include a more horizontal integration of AI-related references, as well as a more extended focus on the cost element of Supply Chain processes and management of Inventory. Moving to the study of the single unit and sub-units, HCIA reported the following:

• **ULO 2**: it is not completely coherent with the market request since it lacks a focus on sustainable and circular material, their identification and sourcing, which is an issue becoming more and more important in the fashion sector. Regarding the issue of traceability, the unit also needs to deepend the use of Artificial Intelligence tools to improve traceability control and to deal with costing issue related to traceability implementation.





When dealing with the suggested skills and knowledge, the partner underlined how skills and knowledge need to address the continuously changing new business environment. The most two important elements that should be emphasized, are Artificial Intelligence and Sustainability / Circular Economy.

More specifically:

- **CE\_MC8:** reducing waste has become a major issue for TCLF companies especially since circular economy and sustainability have become mainstream issues. There is the need to focus more on presentation of real-life cases as well as to include information about costing issues and KPIs for measuring and improving waste results. In addition, using new technologies and AI systems for better planning is important. However, it would be important to clarify how the skills related to the ability to acquire basic ability to manage processes by defining, measuring, controlling and improving processes with the goal of meeting customer requirements profitably is realted to the overall scope.
- **DF\_MC2:** HCIA underlined how AI is affecting all aspects of operation of businesses. The utilization of AI for supply chain management in order to improve efficiency and effectiveness in the supply chain is of utmost importance for any company, especially in such a competitive world. Emphasis should be placed on: (1) Specific AI technologies and their implementation; (2) Case studies of successful AI integration; (3) Cost-benefit analysis of AI solutions; (4) Training requirements and program; (5) Integration challenges and solutions; (6) Performance measurement systems; and (7) Future trends and developments.

#### SUSTAINABILITY TECHNICIAN

The evaluation of the Textile Technologist Curricula was conducted by CEC and by SPIN360. Both partners believe that the Sustainability Technician curricula remains quite up to date as the training units respond to the general objective and themes underlined by the current EU policy priorities impacting the TCLF industries. In CEC's view, there are a few relevant topics that will need to be included. It is pivotal to remember that the Sustainable Technician curriculum was elaborated around 2020, when the tsunami of EU legislation proposals on sustainability had still not been launched, even if the plans were announced under the EU Green Deal and the Circular Economy Action Plan adopted in March 2020. Therefore, the new legislative proposals, some of them adopted, that have followed since then require the revision of the curricula and the inclusion of new concepts. Of note, while the current programme is well aligned with the new Ecodesign for Sustainable Products Regulation ('Ecodesign regulation'), the programme would benefit from training on how to handle extended producer responsibility and eco-modulation, as well as the Digital Product Passport ('DPP') when exploring measures to foster circularity. Other modifications include the need to incorporate the handling of packaging waste in courses dealing with waste, the need refine trainings on how to make environmental claims about a business ("green claims"), and the need for training programmes to include a focus on deforestation and forced labour.

When asked if there were some contents of the sub-united that need to be updated, the partners indicated a list of them and suggested some possibile correction:





- UL0 1: it contains useful knowledge and skills, as well as content in the sub-units. However, the sub-units related to EU Legislation should be complemented with EU legislative Acts- fundamentals, EU industrial and textiles policies, EU environmental legislation and Legislative databases and search engines. It should be also considered the EU Deforestation Regulation, because if leather continues under scope, we might have, to include a reference in the training depending on the impact. There should be a stronger focus on waste management, including packaging waste as well as new concepts from the proposed revision to the Waste Framework Directive including Extended Producer Responsibility and eco-modulation as applicable to apparel and footwear products.
- UL0 2: it should include key concepts of circularity such as: dismantling, recycling (existing methodologies and processes, etc.) and others. In the sub-unit dedicated to the Three pillars of sustainability – profit, there should be a reference to fighting greenwashing as a technique to improve the company's image ( and obtain more profit) and the 2 directives : one more focused on addressing companies – Green Claims Directive (2023/0085(COD)) –and the other on consumers' rights – Directive on Empowering Consumers for the Green Transition (2024/825).
- **ULO 3** : it should include the two recent directives on green claims be explored. These are the Green Claims Directive (2023/0085(COD)), which focuses more on companies' responsibilities and the directive on empowering Consumers for the Green Transition (2024/825) which has a focus on consumer rights. Furthermore, where the ULO includes a focus on assessing life cycle of products and calculating environmental footprint, it is recommended that the training unit refer to Product Environmental Footprint Categories Rules as a tool base for evidence. Such courses will also need to emphasize durability in impact.
- **ULO 4**: it should include the Extended Producer Responsibility (clothing and footwear are considered priority products) and the Digital Product Passport requirements.
- **ULO 5:** to ensure compliance with recent legislation, the sub-unit tackling the issue of environmental impact of disposal of unused/unsold clothing needs specify that such disposal is no longer legally permitted.
- **ULO 7:** since it explores sustainability in the leather industry, this unit should include knowledge and skills on identifying and tracing the impact (or lack thereof) on deforestation of the industry to ensure relevance. It is also important that the unit consider durability of leather in comparison to other materials as part of the environmental impact of the product.

Finally, when asked which suggested skills and knowledge could improve the ones present in the curricula, the partners responded as follows:

• **CE\_MC2:** The concept of carbon footprint is not completely addressed in the previous curricula, therefore some skills and knowledge of this MC can be reflected in the previous one. Moreover, it exemplifies a more holistic approach, which engages with emission reduction from the perspective of production lifecycles, supply chains, consumer habits, and sustainable materials and practices. Similarly, units on circularity include key concepts such as disassembly, modularity, repairability, recyclability, circular design, upcycling, and remanufacturing, some of which are emphasized in the ESPR.





- **DF\_MC7:** it should consider all requirements of the future Ecodesign guidelines (both the horizontal and the specific product related for apparel and footwear, which will be elaborated during the next 2-3 years).
- **DF\_MC8:** it should include packaging waste and introduce the new concepts of extended producer responsibility and eco-modulation from the proposed Waste Framework Directive are included. A short reference to the Regulation on Waste Shipments that entered into force on 21/05/24 might be worth in relation to the need to reduce waste in production (the regulation introduces stronger rules on waste exports to tackle illegal waste shipments). It could be another argument to convince companies of the relevance to reduce waste.

#### DIGITAL MARKETING PROFESSIONAL

The evaluation of the Supply Chain Analyst Curricula was conducted by the Confindustria Accessori Moda.

Confindustria Accessori Moda observed that the job-related skills and competences present in the curricula still well respond to the current state of the footwear sector, and all of the Units of learning correspond to the knowledge and skills currently required by the sector and desired by the companies. However, certain issues should be further implemented and expanded, especially with a focus on:

- GenerativeAl
- Video, images and text production
- Strenghtening collaboration between human workforce and AI
- Emphasis should be put on generative AI, since it is currently the most demanded solution by the productive world.

The skills and knowledge present in both the units and in the sub-units are considered as being still valid and coherent with the market requests. Nontheless, it is necessary to assess the level of depth reached/achievable from the students. Indeed, the units are very rich in information, certainly all necessary for a complete preparation, but the understanding and, above all, the correct use of the techniques illustrated require careful preparation.

Confindustria Accessori Moda also deeply analysed the suggested skills and knowledge which could improve the curricula. The partner recognised the importance of applying the transversal technical knowledge proposed in the previous courses to the new challenges facing the fashion industry. Sustainability is perhaps the most important, but it is necessary to clarify the meaning of 'sustainability' to make it unambiguous. The circular economy is a relevant concept, but it needs to be applied to the world of production and the importance of secondary raw materials needs to be made clear, not only from an impact on the planet point of view, but also from an economic one. E-commerce is now an established practice, but it is important to understand its evolution, especially for the world of fashion, where it is crucial to assess the impact of the omnichannelism demanded by all consumers.

More specifically:

• **CE\_MC5:** To date, there is no clear legislation that defines what it means to produce sustainably. For this reason, it is essential to build a clear communication policy that positions the company





with respect to environmental, economic and social sustainability, keeping these 3 values together. Communicating sustainability is not just a matter of public relations and sharing information, but is a strategic necessity for companies, which must make known their sustainable materials, energy-saving processes, and fashion proposals capable of meeting the needs of consumers who are more attentive to the environment and ethics. Sustainability narratives can be shaped to communicate with different targets, to ensure that sustainability communication is also capable of inspiring action and change. The art of storytelling can transform the perception of sustainability from a series of boring data to an engaging narrative. Telling success stories, overcome challenges or innovative projects can create an emotional bond with the audience. It is essential to focus on real characters, use clear and evocative language and structure the narrative so that it culminates in a solution or a call to action. A well-crafted story not only informs but inspires and motivates action, making abstract concepts of sustainability tangible).

- **DF\_MC1:** he transition to a circular economy, where products are designed to be reused, recycled and valorized, requires radical innovations and creative solutions. It also requires knowledge: knowing the new materials, finding them available in digital libraries, accompanied by exhaustive product sheets is one of the keys to the new design of collections, alongside 3D software or those that help manage excess inventory by placing them on the market, reducing the impact of production on the planet.
- **DF\_MC4:** Omnichannel is the key. Better payment systems and home deliveries, better prices and a wide range of offers, innovative sites and augmented reality, push consumers towards online stores. A customer journey paradigm that straddles the two worlds is increasingly gaining ground: the challenge is integration.

Finally, the partner underlined how the job market is currently looking for people who know how to talk to technicians outside the company, and marketing/communication companies are looking for people inside the company who can guide them in meeting the needs of entrepreneurs. It is extremely important to train these liaison figures, who are greatly demanded: the idea is not to train completely autonomous internal figures (only the largest companies can set up such complex and stratified internal structures), but to develop the ability to dialogue competently and economically with the specific professionals selected. If understood in this sense, all the skills proposed are fundamental to the job market.

#### **PROCESS & PRODUCTION TIMELINE ANALYST**

The evaluation of the Process & Production Timeline Analyst Curricula was conducted by the the National Centre for the Development of Professional and Technical Education – CNDIPT.

In assessing the relevance of the job and job-related skills and competencies present in the curricula, the CNDIPT distinguished between the Clothing sector, the Footwear sector and le Leather sector.

Regarding the Clothing sector, CNDIPT evaluated the methodologies and techniques outlined—process and production timeline analysis, clothing technology, ergonomics, production planning and maintenance, production monitoring, productivity calculation, and work measurement—as being all highly relevant and necessary in industries. However, the sector is increasingly integrating **digital** tools, automation, and data analytics to enhance these traditional methods. These technologies enable





**real-time monitoring, predictive maintenance, and optimisation** of production workflows, essential for meeting **fast fashion demands**, ensuring **high quality**, and improving **sustainability**. The traditional principles of production management and work measurement still provide the foundation, but adapting to **smart manufacturing, Al-driven decision-making, and sustainability** is critical for staying competitive in the evolving clothing industry.

Moving to the footwear sector, the partner observed that the core techniques and methodologies used in footwear production—from process and production timeline analysis to ergonomics, production planning, productivity calculations, and work measurement—are all still highly relevant. However, the footwear industry is increasingly integrating smart manufacturing technologies, automation, and data analytics to enhance these traditional methods. The shift toward more customised products, faster production cycles, and sustainability requires continuously evolving these techniques. The footwear sector must leverage advanced technology such as 3D printing, real-time data collection, and machine learning to meet modern demands while improving efficiency, quality, and worker well-being.

Finally, regarding the Leather sector, the core principles of leather manufacturing, such as **process optimisation, quality control, production planning, and time measurement**, remain relevant and are even more critical in today's industry. The sector is transforming technologically by integrating **automation, data analytics, real-time production monitoring, and sustainability initiatives**. These developments are essential for improving **productivity** and **quality** while meeting growing consumer demands for **eco-friendly and high-quality** leather products. To stay competitive, leather manufacturers must adapt traditional methods to the modern needs of the industry, focusing on **innovative production processes, automation in wet-processing and finishing, and more sustainable production techniques.** 

Regarding the validity of the skills and knowledge of both units and sub-units, the partner observed that management practices and strategies outlined—new business models, QMS, process re-engineering, cost analysis, lean production, data management, and business intelligence—are valid and essential for TCLF companies to thrive in the modern landscape. However, they must be adapted to incorporate digital technologies, sustainability goals, and real-time data to meet the evolving demands of consumers and the global marketplace. The industry is increasingly driven by speed, quality, and sustainability, making these management systems even more critical in shaping future success.

Overall, the production, planning, and maintenance strategies, such as process & production timeline analysis, textile technology, ergonomics, maintenance planning, work measurement, and productivity calculations, are still highly relevant to the textile sector. However, they have evolved significantly due to technological advancements. The sector's increasing focus on **automation**, **data-driven decision-making**, **and sustainability** requires adapting these techniques with digital tools, real-time analytics, and predictive technologies to remain competitive. By incorporating advanced technologies such as **AI**, **IoT**, **big data**, **and robotics**, textile companies can address new challenges and meet the demands of an increasingly dynamic market.

Moving to the proposed skills and knowledge, CNDIPT evaluated that, in general, the labour market demands increasingly efficient production processes and global competition. Using digital tools for





process and production timeline analysis is highly relevant and increasingly critical for T/C/L/F companies, as it directly contributes to efficiency, quality, and agility. These tools reflect the current trends in digitisation, automation, real-time tracking, and data-driven decision-making. They help companies address the growing challenges of sustainability, customisation, speed-to-market, and global supply chain management.

In particular, the partner analyzed the different groups proposed:

- CE\_MC10: CNDIPT believes that all the skills and knowledge proposed are highly relevant to the current labor market, however there are some areas where the curriculum could be enhanced to better respond to emerging trends and demands within the fashion industry. When referring to acquiring practical experience in applying repair and reuse techniques in the Fashion Industry, the partner suggests to include practical experience with technological innovations in the repair and reuse space, such as automated garment repair stations or apparel repair apps. Providing exposure to industry-grade tools that brands are adopting for on-demand repairs and customized redesigns would be beneficial. Focusing on the kwnoledge, CNDIPT suggested to: expand practical skills to include technological innovations in repair and reuse (e.g., 3D printing, digital repair tools); broaden the scope of creative problem-solving to include modular design and design for disassembly; integrate more content on emerging technologies like blockchain for transparency and Al-driven sustainable fashion solutions; expand the understanding of circular business models to include fashion rental and upcycling.
- **DF\_MC9:** the skills and knowledge presented are well-aligned with market needs, since they address critical competencies required for quality control and assurance roles in industries utilizing sensing and artificial vision technologies. Nonetheless, there are areas where the curriculum could be expanded to reflect emerging trends in the field of quality control and assurance, particularly in AI, sensing technologies, and machine vision. To ensure the curriculum fully meets future labor market demands, it could be improved by expanding on: AI-driven quality systems and machine vision technologies; predictive analytics for proactive quality control; integrating real-time sensing technologies and data-driven quality assurance processes into quality management systems. By incorporating these emerging trends and focusing on the integration of AI and automation in quality control, the curriculum would better prepare students for the rapidly evolving landscape of smart manufacturing and industry 4.0.
- DF\_MC2: also in this case, the skills and knowledge are considered as highly relevant to the labor market, there are areas where they could be expanded or refined to better align with emerging trends and demands in the fashion industry. However, expanding the curriculum to include: more hands-on experience with fashion-specific datasets and AI tools; a deeper dive into emerging AI technologies like GANs for design and AR for virtual try-ons; a broader discussion on AI ethics, including data privacy, algorithmic bias, and the social impact of AI on workers. By addressing these areas, the curriculum will be better aligned with both current and future trends in the fashion industry, ensuring that students are equipped with the knowledge and practical skills needed to succeed in an AI-enhanced fashion world.





### Conclusion

This report intends to summarize and display the main findings gathered during an extensive analysis realized by the partners of the METASKILLS4 TCLF Project, regarding the curricula developed during the previous Skills4Smart TCLF 2030 Blueprint Project.

The analysis was conducted using two main internal instruments: the Curricula Evaluation Form and the Short Report Template, which allowed the partnes to do a quite homogenous work and to report in a coherent way all the information.

Even more information about the analysis of the S4TCLF curricula can be found in the Curricula Evaluation Forms (Annex I), where the partner explored and analyzed in deep all the aspect of the courses.

The results obtain from this Task will be extremely important for building a bridge between the curricula developed in the previous Blueprint Project and in the current one, in order to offer different possible training pathways to the students and to all those willing to learn about the TCLF Sector.



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