

# PRESENTATION OF THE FIRST MOOCs

## New Massive Open On-line Courses for the TCLF industries!

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### S4TCLF IN TIMES OF COVID-19

The COVID-19 outbreak is a major shock for Europe and the entire world. It represents an unprecedented situation for citizens, societies and economies.

The economic impact of the lockdown on the European TCLF sector is severe, but companies are fully committed to do what it takes to contain the spreading of the virus. The protection of the health and safety of the sector's employees, suppliers and customers is the main priority. In addition, a number of TCLF companies have deviated their production lines to produce protective masks (textiles), face shields (footwear ) and clothing (garment). Others were already active in the food and pharma supply chain with gelatine and collagen (tanners).

Resilience is possible with the collaboration of all public and private stakeholders, and when it comes to companies thanks to a highly educated and trained workforce. This is why the ERASMUS+ S4TCLF Blueprint is so important!

Challenges also bring opportunities and the current situation could be an opportunity for upskilling the sector's workforce. The S4TCLF project partners are ready to contribute with the launch of the pilots for the training material for 8 new/ updated occupations that they have developed so far.

This crisis is not only a major challenge for public health, but will also have dramatic negative impact on EU growth in 2020. The fashion industry is already being impacted directly and indirectly, as the TCLF sector is a cross-sectoral industry providing intermediate goods for almost every economic sector and finished consumer products on high street markets everywhere. Therefore, it is vital to provide the sector's human resources with the skills that the "new normality" will require. The profiles and training material developed in S4TCLF to upgrade the high quality of TCLF products while grasping the opportunities of digitalization and sustainability are excellent tools!

Some policy measures and actions in support of the economy have been adopted by national mem-



ber states and the EU. The Commission has also approved the extension of an EU State aid Temporary Framework, the application of fully flexible EU fiscal rules and a 37 billion Euro Coronavirus Response Investment Initiative to provide liquidity to small and medium businesses. Another Commission's temporary initiative is SURE – Support mitigating Unemployment Risks in Emergency, that is currently helping cover the costs of national short-time work schemes and to preserve jobs.

These measures enable national and regional governments to better support the economies. However, they should not underestimate the need for investing in education and training of people, which are the main asset that will allow the TCLF sector to exit the crisis and respond to companies' skills needs.

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## TEXTILE TECHNOLOGIST

The textile market has deeply changed in the last twenty years, especially with the introduction of new textile machines and the innovative production processes. Within this context it's very important the role of the textile technologist who develops and supervises the textile production system according to the quality system: processes of spinning, weaving, knitting, finishing namely dyeing, finishes, printing with appropriate methodologies of organisation, management and control and using emerging textile technologies.

Especially considering Industry 4.0, it is essential a profile which contributes to develop new collections and implements the new trends about yarns, structures, surface treatments and production technologies (machinery) in order to guarantee an added value to the products.

For this reason, the aim of the S4TCLF project is to make training programmes and learning contents attractive to this textile profile. The purpose of the project is to enhance the modernisation and competitiveness of the European textile sector through the development of a sustainable upskilling and reskilling strategy that will be in line

### 2. The winding and the spooling process

What is the winding process?



The winding process (www.simet.it)



The spool (www.simet.it)



The package in Lanificio Carignoli, Treviso, Italy

It transfers the yarn from the tube onto the twisting bobbin (spool), winding the yarn on a rigid tube. The outcome is called package.

with the companies' needs. To answer one of those needs the S4TCLF consortium decided to develop MOOCs (Massive Open Online Course) in order to create programs and training courses that illustrate what skills are required to be a textile technologist.

The purpose of the textile technologist MOOC is to transfer skills about the knowledge and the optimisation of the textile manufacturing system management, both traditional and innovative, relating to the all working processes. Moreover, the lessons illustrate how to communicate and contact with suppliers, customers, and different departments of a textile company (production, quality control labs, R&D), during the product production.

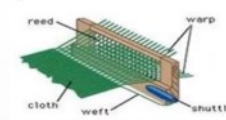
In particular, through these MOOCs, you can learn the fundamentals and tools about processes of spinning, weaving, knitting, finishing namely dyeing, finishes, printing with appropriate methodologies of organisation, management and control and using emerging textile technologies.

It's your turn! Learn with these materials and become a new textile technologist: enjoy!

### 1. Basic fabric structure (weaves)



[https://en.wikipedia.org/wiki/Shed\\_\(weaving\)](https://en.wikipedia.org/wiki/Shed_(weaving))



<https://www.britannica.com/technology/shed>

#### ULO 1- Fibres, yarns and fabrics (non-woven, woven and knitted).

Lesson 1- Types of fibres/Lesson 2- Textiles yarn classification/Lesson 3 - Fabric Structure.

#### ULO 2 - Quality control strategies and protocols. Textile metrology and standard

Lesson 1 - Metrology and links to the textile quality control/Lesson 2 - Standardization and standards/Lesson 3 - Documented information regarding the quality of a textile product/Lesson 4 - The measurement process: the essentials on the process accuracy and description of its specific structure/Lesson 5 - Textile testing: from measurement procedure to practice.

#### ULO 3 - Spinning

Lesson 1 - Spinning processes/Lesson 2 - Characterisation of yarns/Lesson 3 - Quality control and digital technologies in spinning mills/Lesson 4 - Non conventional yarns.

#### ULO 4 - Weaving production process

Lesson 1 - Preparation of the weaving process/Lesson 2 - Weaving machines/Lesson 3 - Management and programming of the weaving process/Lesson 4 - Optimisation of the weaving process/Lesson 5 - Control systems of the weaving process

#### ULO 5- Warp and weft knitting production process

Lesson 1- General terms and concepts/Lesson 2 - Circular Weft Knitting/Lesson 3- Flat Weft Knitting/Lesson 4- Warp Knitting/Lesson 5 - Knitting Technical and Quality Parameters.

#### ULO 6 - Tufting production process

Lesson 1 - Tufting: Introduction/Lesson 2 - Tufting machine/Lesson 3 - Patterning systems/Lesson 4 - Backing/Lesson 5 - Production parameters

#### ULO 7 - Manufacturing the nonwoven fabrics

Lesson 1 - Nonwovens: introduction/Lesson 2 - Web formation techniques/Lesson 3 - Web bonding techniques.

#### ULO 8 - Dyeing, colouring and finishing processes

Lesson 1 - Pretreatments for fabric finishing/Lesson 2 - Dyeing processes/Lesson 3 - Textile printing processes/Lesson 4 - Finishing processes.



## LEATHER TECHNOLOGIST

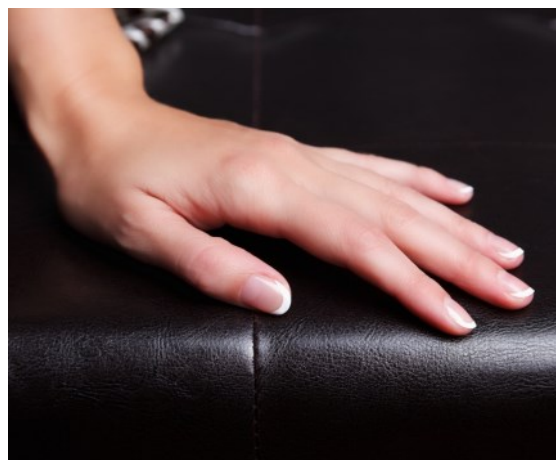
As a residue from the meat industry, leather a sustainable material, but of course its transformation requires chemical processes for which knowledge in chemistry and biotechnology is essential.

The Leather Technologist occupation promoted by the S4TCLF project plays an important role in the new trends of leather manufacturing. Sustainability, high quality of the end product and the last trends in fashion and design all combine into a new set of skills for the Leather Technologist. These skills include the knowledge of wet processes in big drums, clean technologies, and creative skills in the finishing department.

As the R&D department is essential in the leather industry, collaboration with universities and research centres is needed to promote innovation and transfer of knowledge to the VET providers who will provide training for this new profile.

The Leather Technologist curricula combines two learning approaches and training methodologies: (i) providing trainers with innovative learning tools and instruments; (ii) promoting effective learning by empowering learners with the required knowledge.

In this MOOC, general and specific knowledge will be acquired in the fields of the leather manufacturing processes, the chemistry of leather, wet process operations, mechanics, finishing, quality of leather, sustainability via available clean technologies and risks monitoring. It will not only includes



up-to-date information, but also concrete examples illustrating the skills required to be a Leather Technologist

A complete set of learning materials will be available to trainees, including the possibility of learning practical skills in a real environment at pilot and industry facilities. There, they will be able to follow the whole leather processing, from the raw material to finished leather. They will also learn about the last trends in leather design and finishing patterns. Innovative wet processes will be developed at pilot scale to ensure the expected quality requirements.

We invite you to join us in our MOOC and to be part of a changing global learning process!



### ULO 1- Leather processing chain.

Lesson 1- What is leather?/Lesson 2- Preservation of raw hides and skins./Lesson 3 - Operations of the leather processing chain (1)./Lesson 4- Operations of the leather processing chain (2).

### ULO 2 - Chemicals, materials and leather chemistry

Lesson 1 - Some facts about chemistry of hides and skins./Lesson 2 - Chemicals and materials for leather manufacturing./Lesson 3 - Chemicals management and housekeeping./Lesson 4 - Clean technologies in tanneries.

### ULO 3 - Leather processing in beamhouse operations

Lesson 1 - The Soaking process of raw material./Lesson 2 - Beamhouse operations: Unhairing and liming./Lesson 3 - Mechanical beamhouse operations: Fleshing and splitting./Lesson 4 - Beamhouse operations: Unhairing and liming.

### ULO 4 - Leather processing in tanning and post tanning operations

Lesson 1 - The tanning process: pickling and chrome leather tanning./Lesson 2 - Tanning technologies: wet-blue tanning, vegetable tanning and wet-white tanning./Lesson 3 - Post-tanning operations: retanning, greasing and dyeing./Lesson 4 - Post-tanning mechanisations: sammying, drying, conditioning and staking of the leather.

### ULO 5- Leather finishing operations

Lesson 1- General features of leather finishing./Lesson 2 - Finishing products: binders and polymers, colouring agents, cross-linkers, lacquers and auxiliaries./Lesson 3- Typical coating layers and their relation with the final leather use./Lesson 4- Machinery for painting, drying and ironing. Auxiliary machines for finishing of leather./Lesson 5 - Emissions of pollutants from finishing: VOC and new free of VOC clean technologies.

### ULO 6 - Quality monitoring and control

Lesson 1 - Quality control along production process./Lesson 2 - Quality assessment of finished leather./Lesson 3 - Technical characteristics and requirement of leather for different usages./Lesson 4 - Quality regulations and chemical risk monitoring./Lesson 5 - Healthy and safety in the workplace.

## 3D CAD FOOTWEAR DEVELOPER

Why does the S4TCLF project addresses the 3D CAD Footwear Developer profile?

The extensive research conducted by the project consortium with VET providers, Footwear companies, and technology experts in Europe has shown that Design and Patternmaking in the Footwear industry has been completely revolutionised by the emergence of new technologies, and digitalisation in particular.

New Computer-Aided Design (CAD) solutions have significantly changed the way designers and patternmakers operate by shifting the balance from 2D to 3D design and prototyping. These new solutions make work faster, more precise, more efficient and more sustainable. However, in order to maximise the potential of these tools, specific skills and competences are required and they have consequently been included in the new profile developed by the project. The 3D CAD Footwear Developer curricula will therefore focus on teaching students how to use these new digital solutions at every step of the process, from last creation to final prototype.

But new technologies in footwear aren't confined to the realm of software. The manufacturing

process itself has evolved, with new moulding equipment, additive manufacturing, 3D printing, and new sustainable materials making their way to European shoe factories and revolutionising the production process. Because the 3D CAD Footwear Developer is involved in the early development stages of a piece of footwear, he/she has to know how these technologies work to be able to foresee right from the start how they can be used to manufacture the shoe model they are designing. Only then can one take advantage of what these new manufacturing techniques offer in terms of streamlined production, costs savings, sustainability, waste reduction, and increased added-value for end-customers.

The 3D CAD Footwear Developer MOOC ((Massive Open Online Course) will be a vehicle to teach students about the contemporary process used to conceive, create and shape innovative shoes. The programme is divided into 7 Units, each comprising 4 to 6 lessons .

### ULO1- Footwear product design and styling process

Lesson 1 - Fashion Trends/Lesson 2 - Marketing and competition for the design process/Lesson 3 - Set-up and coordination of the Footwear Collection/Lesson 4 - Creative design and Collection development

### ULO2- Overview on the specific footwear manufacturing stages and technology.

Lesson 1 - Company structure and organization/Lesson 2 - Types of footwear and their functionalities/Lesson 3 - Footwear materials and components/Lesson 4 - Footwear quality and testing/Lesson 5 - Footwear manufacturing overview

### ULO3- 3D CAD Footwear Developer modelling and virtual prototyping

Lesson 1 - Digitisation of the last/Lesson 2 - Development of shell and pieces in the footwear virtual model/Lesson 3 - Development of accessories and components in the footwear virtual model/Lesson 4 - Development of materials and textures in the virtual model/Lesson 5 - Presentation of a realistic model by rendering and PBR.

### ULO4- Footwear CAD 2D pattern engineering

Lesson 1 - CAD systems: from 3D to 2D/Lesson 2 - 2D pattern engineering/Lesson 3 - Grading and allowances/Lesson 4 - Nesting and consumption of materials/Lesson 5 - From pattern-making to production

### ULO5- CAD 2D/3D Lasts

Lesson 1 - Data base of lasts/Lesson 2 - Creation of new lasts from previous last geometries/Lesson 3 - Last grading/Lesson 4 - Last measurements/Lesson 5 - 3D Printing and milling of lasts

### ULO6- CAD 2D/3D Soles and Heels

Lesson 1 - Bottom components for footwear: insoles, soles and heels/Lesson 2 - 3D CAD of soles/Lesson 3 - 3D CAD of heels/Lesson 4 - Grading and obtaining the size series for bottom components/Lesson 5 - Moulds for soles or heels

### ULO7- Rapid prototyping processes and technologies in footwear industry

Lesson 1 - Introduction. What is additive manufacturing (AM)? Application to footwear industry./Lesson 2 - Rapid prototyping issues. How can I design for 3D printing?/Lesson 3 - AM technologies. What can I use? AM Technologies vs Industrial use./Lesson 4 - Operating 3D printing equipments.



## CLOTHING CAD PATTERN MAKER

Did you know that the fashion market is increasingly versatile and the Clothing CAD Pattern Maker profile is crucial to meet the challenges of the industry and consumers, in the design and structure of clothing addressing to new demands such as individuality, sustainability and innovation?

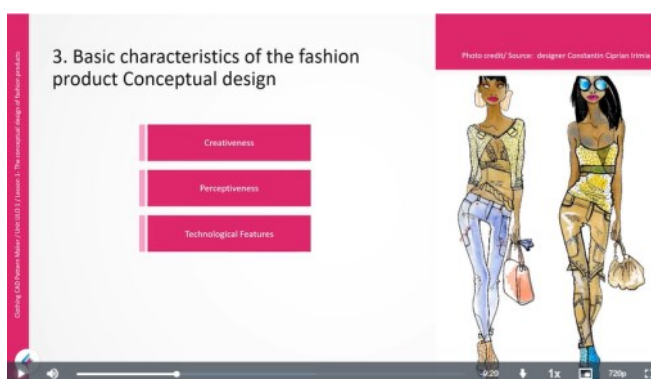
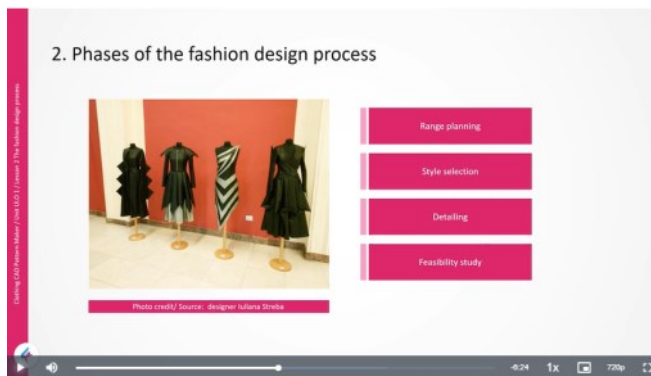
Nowadays, clothing companies combine different departments, such as R&D departments and creative areas, with fashion designers to promote innovation, collaborate with the scientific and technological system, like universities, VET providers and Technology centres, among others, in order to enable the transfer of knowledge to companies.

The S4TCLF partnership has embarked on this big adventure of designing innovative and attractive training programmes and learning contents.

The Clothing CAD Pattern Maker curricula combines interesting learning approaches and training methodologies with twofold: (i) providing trainers with innovative learning tools and instruments; (ii) promoting effective learning by empowering learners with the knowledge they need to progress.

It was created a MOOC that allows you to acquire a structured knowledge, providing an accessible and flexible way to learn, creating your own learning rhythm.

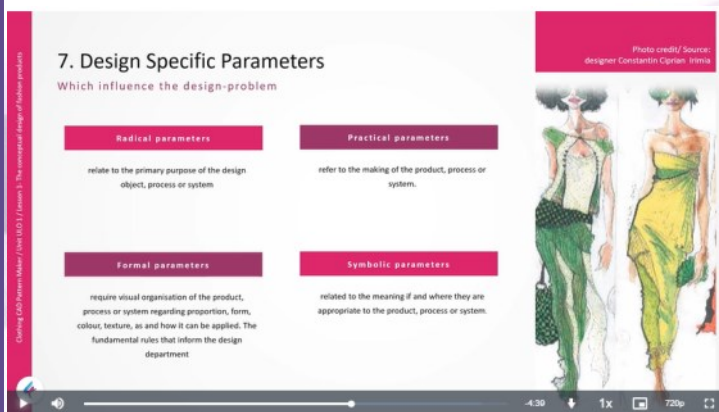
The MOOC designed by experts from Belgium,



Italy, Portugal, Poland and Romania gathers current information using concrete examples that illustrate what skills are required to be a Clothing CAD Pattern Maker.

You can find interactive learning materials and a differentiated pedagogy that drives specific knowledge in collection design, textile materials and processes, 2D CAD pattern making, 3D CAD software tools, Prototyping and Tech Pack which allow you to keep up with the evolution of the clothing industry.

We invite you to join us in our MOOC and to be part of a changing global learning process!



### ULO 1- Collection design and development for clothing industry.

Lesson 1- The conceptual design of fashion products./Lesson 2- The fashion design process./Lesson 3 - New tendencies and approaches in fashion design./Lesson 4- Apparel product development./Lesson 5- Product development models.

### ULO 2 - Textile materials and processes in clothing industry

Lesson 1 - Fabric selection based on the model./Lesson 2 - Structures of the fabrics./Lesson 3 - Commercial glossary./Lesson 4 - Garment accessories./Lesson 5 - Manufacturing Process.

### ULO 3 - 2D CAD pattern making for clothing

Lesson 1 - Make a basic pattern./Lesson 2 - Adjusting the pattern for different fabrics./Lesson 3 - Adapt an existing pattern./Lesson 4 - Grading & Sizes.

### ULO 4 - 3D CAD software tools for clothing design

Lesson 1 - Human body anthropometry in 3D CAD software./Lesson 2 - Visualisation of the prototype on the avatar./Lesson 3 - Evaluation for correction of the virtual prototype.

### ULO 5- Prototyping. Validate the design and prepare the patterns for production

Lesson 1- Prototype validation./Lesson 2 - Grade the garment model with CAD software./Lesson 3- Prototype validation./Lesson 4- Generate the bill of materials (BOM) and estimate the costs.

### ULO 6 - Design Tech Pack

Lesson 1 - General terms and concepts./Lesson 2 - Product Identification and Specifications./Lesson 3 - Materials and accessories specifications./Lesson 4 - Inspection and packing specifications.

## Interview with Aura Mihai, PhD., Professor at "Gheorghe Asachi" Technical University of Iasi



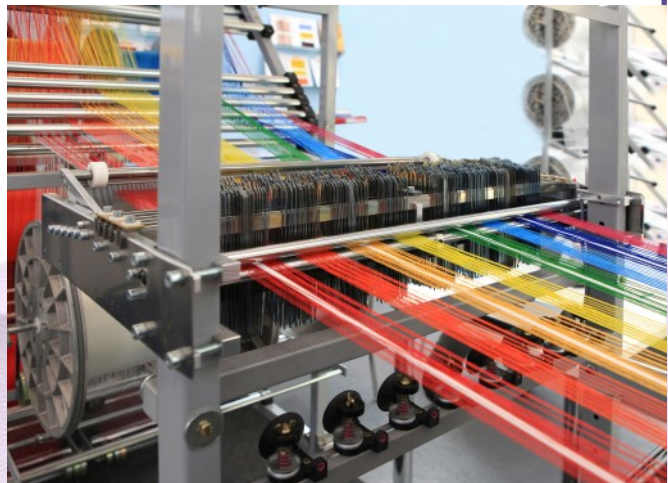
Aura, you have been managing the WP VII dedicated to the design of the curricula for the TCLF needed profiles. This is one of the biggest WP of the S4TCLF project, as it develops the main education/training content that will then be used during the piloting phase.

- First, how did you identify the ULOs?

Based on the outcomes of a widespread research conducted with companies and VET providers from Skills4Smart TCLF partner countries, 8 new qualification profiles for the Textile, Clothing, Leather and Footwear (TCLF) sectors were selected, defined and validated in terms of coherent sets of professional skills and competences. The entire process helped us identify the core Units of Learning Outcomes (ULOs) which enable a progressive achievement of the qualification. This bottom-up approach proves a strong anchoring in the labor market realities of the European TCLF sectors and has enabled the development of curricular content that fills the sectoral skills gap and respects the principles of the European Qualification Framework (EQF) and European Credit System for Vocational Education and Training (ECVET).

- How did this lead to the creation of the MOOCs?

For all 8 profiles, 51 ULOs were completed, totaling 213 Lessons and 51 sets of Exercises and Assessments, all of them in 50 language versions, to facilitate the learning process with a strong connection to real-life situations of work-based learning. The lessons are transformed into video lectures, including language script, test quizzes and additional resources. Our Massive Open Online Courses (MOOCs) gather all of them, designed both as standalone online courses and as a learning support in face2face training sessions. The workload was huge, and all this could be done with the high expertise of project teams from partner countries. We are immensely proud with our achievements so far, and we invite our beneficiaries (companies, VET schools, teachers and trainers, students, individual learners etc.) to confirm this statement during the piloting stage. It is the most extensive training package, containing the latest novelties and developments within the TCLF sectors.



- Great! What happens next?

Curricular content and training materials for the 8 occupational profiles comply with the highest quality standard for online courses and are grouped into 8 MOOCs on the Skills4Smart Online Academy, that will be launched on a prestigious online learning platform, namely **Iversity**, part of **Spring Nature** publisher. We are currently testing the MOOCs for the first 4 profiles, ie Clothing CAD Pattern Maker, Textile Technologist, 3D CAD Footwear Developer and Leather Technologist, and hope to launch them soon.

- To conclude, do you have any recommendation for the companies in the TCLF sector?

Our Skills4Smart MOOCs address the EQF level 5, with two target categories: learners from the initial VET systems to skill them for the new emerging occupations, and employees from companies to upskill or re-skill them according to the latest technologies, business and production models, innovative materials, CAD CAM systems, sustainability, digitalization, etc.

We are living strange times, and probably many companies from our sectors must face huge transformations in the post corona virus period. Whatever the future will reserve us, one thing is certain: **we are able to reinvent ourselves if we are Smart and Skilled**. In this respect, we invite the TCLF companies to participate in the piloting phase of the Skills4Smart TCLF project.

*Thank you, Aura!*



## The 6<sup>th</sup> Technical Meeting of the Skills4SmartTCLF consortium

Due to the COVID-19 situation, the 6<sup>th</sup> Technical Meeting of the S4TCLF project partners, which initially was planned to be held in Barcelona, had to be adapted to take place via conference call. Partners used the occasion to discuss more in detail certain aspects that are not usually addressed in the regular coordination calls. The first half of the meeting was dedicated to review several administrative and financial aspects, as well as to make a brief introduction to the new action plan that EURATEX aims to implement for the project dissemination activities.

Additionally, partners discussed some possibilities for the venue and format of the upcoming yearly Public Event of the project. Although it was originally scheduled to be held in Autumn 2020 in Italy, it will probably be postponed to early 2021, in order to avoid the potential problematics caused by the COVID-19 pandemic.

In the second part of the meeting, the discussion focused on the development of certain specific Work Packages. The partners in charge made an up to date about the currently ongoing tasks and presented the upcoming steps in the context of the Sectoral Skills Strategy development. Likewise, the currently ongoing and upcoming tasks were presented in the areas of Attractiveness of the TCLF sectors and the European Fashion Campus.

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