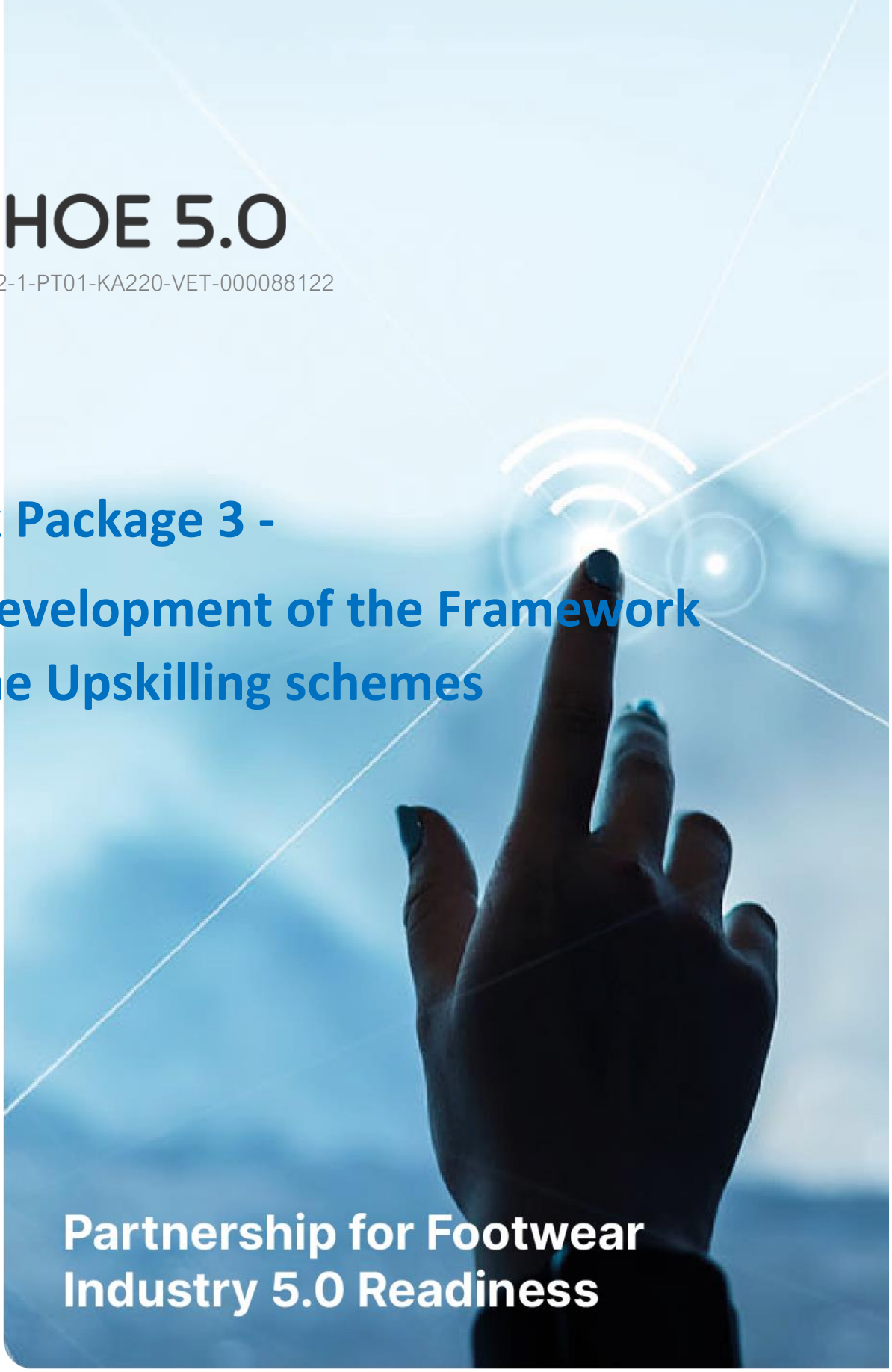
SHOE 5.0

2022-1-PT01-KA220-VET-000088122

Work Package 3 -

3.1 Development of the Framework for the Upskilling schemes



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Content

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Introduction

Shoe 5.0 strategically focuses on enhancing competencies to seamlessly integrate Industry 5.0 concepts into the footwear industry. The project is dedicated to empowering workers, managers, and leaders of small and medium enterprises (SMEs) with the knowledge required to implement new technologies, processes, and systems. This initiative optimises company performance, promotes sustainability, and improves overall efficiency.

Through the activities carried out within WP2, the following results have been achieved:

2.1. **Study on Industry 5.0** applied to the footwear industry in Europe;

2.2. **Report with the key profiles** for the future footwear industry's workforce related to Industry 5.0 (**5 profiles**- 4 updates and 1 new):

- ***Footwear Technical Manager***
- ***Footwear Manufacturing Operator***
- ***Footwear Designer/Pattern Maker***
- ***Maintenance Technician***
- ***i5.0 Footwear Architect – a new profile***

2.3. **Report with dedicated training plans** according to training needs (**15 Units of Competence/Learning Outcomes**), which includes the description of the unit, keywords, learning objectives, qualification level (EQF/NQF) or pre-requirements, learning outcomes in terms of knowledge and skills, the pedagogical methodology for delivering the learning content, a detailed syllabus outlining the structure of the unit with individual lessons, assessment methods, and a list of the training materials to be employed.

2.4. **Scanning Tool** – It is a self-assessment online tool available on the project website that allows collecting information about training needs on footwear manufacturing-related skills and knowledge and designing a possible training pathways customised for each learner.

2.5. **Collaborative workshops** (Portugal, Italy, Romania, Spain and Belgium).

The ultimate goal of WP3 is to have **a training tool kit with innovative contents** (virtual and augmented reality) and **practical exercises focused on the Digital Key competencies for the Footwear sector in Industry 5.0, supported by Manuals for trainers**. The importance of having a toolkit that addresses the trainee's contents and the trainer's methodologies is explained by the fact that we are dealing with a new reality. This new reality allows us to create innovative content representing the expected skills for I5.0. Therefore, the project uses augmented and virtual reality in the working context to transfer trainees the needed skills for using equipment or even to take defined procedures. Consequently, trainers must also be involved in this new paradigm to support trainees during the VET training.

It is essential to take notice that the development of WP3 is bound to the results achieved in WP2, namely Task 2.2, 2.3 and 2.4, where the results coming out of the identified needed profiles and even the Scanning tool play an essential role in the development the framework for the Upskills schemes, meaning that both methodologies need to be coherent.

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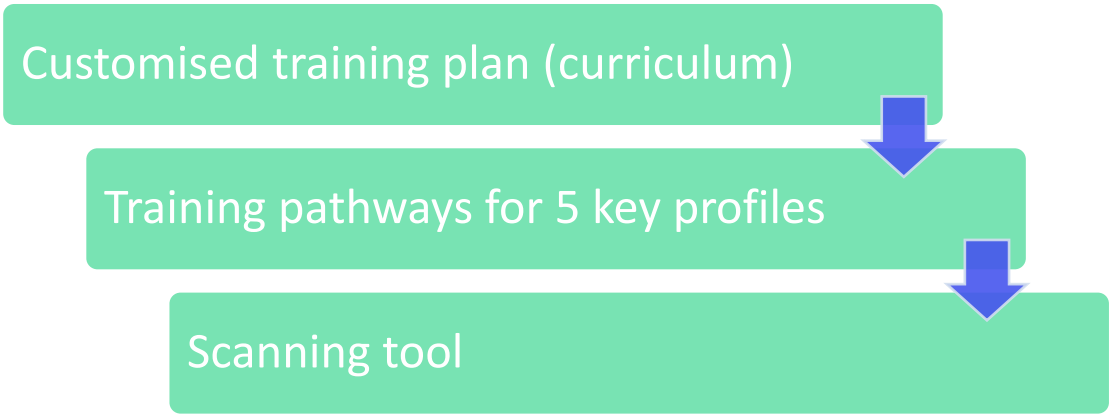
This document is dedicated to **the educational framework for the Upskills schemes related to I5.0,** which *contains a set of minimum levels of learning objectives that a specific job profile related to I5.0 shall have or acquire by progressing towards an upper qualification based on the accomplishment of a recognised skill set of qualifications or equivalent*. The framework contributes to establishing the several training pathways and contents that need to be created.

The educational framework for the Upskills schemes related to I5.0 considers the 5 profiles defined in Task 2.2 and the customised training plans developed within Task 2.3.



Customised training plan

A **customised training plan** (curricula) is developed under the scheme of EQF (European Qualification Framework[1]), seeking the correspondence with the **updated profile** of the **Footwear Technical Manager; Footwear Manufacturing Operator; Footwear Designer/Pattern Maker; Maintenance Technician;** and the **NEW profile** of the **i5.0 Footwear Architect,** as well as the recognition and future certification in the Shoe 5.0 partner countries. Furthermore, the **training curricula is modularised** to be used as a standalone training programme or in a tailor-made training concept, in articulation with the package of pedagogical material delivered through advanced learning technologies with augmented reality embedded and immersive tutorials. The program incorporates specific learning outcomes with corresponding time allocations, encompassing knowledge and skills.

The **customised training plan** encompasses a comprehensive set of information, including a description of the unit, keywords, learning objectives, qualification level (EQF/NQF) or pre-requirements, learning outcomes in terms of knowledge and skills, the pedagogical methodology for delivering the learning content, a detailed syllabus outlining the structure of the unit with individual lessons, assessment methods, and a list of the training materials to be employed. This multifaceted approach ensures a thorough and well-rounded understanding of

[1]European Qualifications Framework (EQF). Retrieved from https://ec.europa.eu/ploteus/content/descriptors-page

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each competency unit, facilitating effective teaching and assessment processes. Each UC/ULO and its detailed structure are described below.

The curricula are structured into **15 Units of Competence (UC)/ Units of Learning Outcomes (ULO),** with **64 lessons covering** topics of significant relevance to **Footwear Industry 5.0**. The topics have been defined based on Desk Research, Focus Groups and Questionnaires and later validated within the Collaborative Workshops. All the activities involved direct beneficiaries and other stakeholders, including entrepreneurial, technical/scientific, education and policymakers from Portugal, Spain, Romania, Italy, and other European countries outside the consortium.

Considering key criteria, including learning outcomes, workload and level, each UC/ULO is assigned **4 micro-credentials**, equivalent to **100 hours**, including training and assessment. **One micro-credential**, designed to enhance specific skills or competencies, is designated for a comprehensive training program spanning **25 hours**, ensuring focused and efficient learning outcomes tailored to meet learners' needs[2],[3]. All **15 UC/ULOs** are estimated to cover **1500 hours**, corresponding to **60 micro-credentials.** The established curricula correspond to **EQF level 5 or 6**.

[2] CEDEFOP. (2023). Microcredentials for labour market education and training: Microcredentials and evolving qualifications systems. Retrieved from https://www.cedefop.europa.eu/files/5589_en.pdf

[3]European Commission. (2020). Digital Education Action Plan 2021-2027. Retrieved from https://ec.europa.eu/education/sites/default/files/document-library-docs/deap-swd-sept2020_en.pdf

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An **AR/VR element**, an **infographic**, and a **video** are also developed for each UC/ULO.

UC/ULO 1 Management of Human Resources for Industry 5.0	UC/ULO 2 Programming using Block Language	UC/ULO 3 Big Data in Footwear Industry 5.0	UC/ULO 4 Networking & Coworking
UC/ULO 5 Product Traceability & Supply Chain for Industry 5.0	UC/ULO 6 AI in Footwear Industry 5.0	UC/ULO 7 Manufacturing i5.0	UC/ULO 8 Co-innovation 5.0
UC/ULO 9 Corporate Social Responsibility for Footwear Industry 5.0	UC/ULO 10 Ergonomics and Digital Anthropology	UC/ULO 11 Bio-Inspired Materials and Technologies	UC/ULO 12 Wellbeing in Industry 5.0
UC/ULO 13 Wellbeing in Industry 5.0	UC/ULO 14 Circular Design, Smart Materials and Innovative Processes	UC/ULO 15 Ultra and Mass Customisation	

UC/ULO 1

Management of Human Resources for Industry 5.0

Society 5.0 is essentially marked by the positioning of human beings at the centre of innovation and technological transformation.

The implementation of Industry 5.0 and its premises brings with it numerous challenges, particularly in the area of people management.

Managing increasingly diverse workforces, which now include robots and cobots, dispersed teams and candidates in an increasingly volatile job market, requires more and more practices and processes that enable efficient management of work teams.

This unit aims to inform participants of the new guidelines for managing people and teams, and how to strengthen the organisational culture and environment. It is important to align people with the values and culture of the organisation so that they are more prone to change and the volatility that companies are subject to in the external environment. For this reason, the unit also focuses on developing the most relevant transversal skills in the job market and how to enhance them: communication, problem-solving, and emotional intelligence, among others.

People Management in the Age of Innovation	Communication and Empathy	Emotional Intelligence	Problem Solving	Leadership in Industry 5.0

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UC/ULO 2

Programming using Block Language

Block-based programming is transforming the footwear industry, providing an easily accessible tool for designers, manufacturers, and machinery operators. Its intuitive nature enables industry professionals without coding experience to embrace automation and optimise processes. This methodology excels in custom design and rapid prototyping, empowering designers to create unique patterns and designs efficiently and facilitating swift adjustments without complex coding. In production, it ensures precision and efficiency by guiding machines and robots through critical tasks, reducing errors, increasing speed, and empowering operators in small maintenance tasks. Crucially, block-based programming is a vital bridge in the transition from Industry 4.0 to 5.0. It seamlessly integrates sensors and intelligent control systems for real-time monitoring, enhancing quality and efficiency across the supply chain. This shift towards more visual, operator-centric systems aligns with the principles of Industry 5.0, making block-based programming pivotal in the ongoing evolution of the footwear sector.

- Introduction
- Exercises
- Saving and Opening Projects
- Block Programming in the Footwear Industry: Practical Example and Applications

UC/ULO 3

Big Data in Footwear Industry 5.0

In general, big data analytics describes the process of detecting trends and correlations among big amounts of raw data, to make data-informed decisions. Today, data can be gathered thanks to modern technology from different sources; once they have been grouped and stored, they can be clean and analysed, having different uses in many industrial sectors.

When applied to the Footwear industry, Big Data can serve numerous purposes: from detecting trends in consumers' preferences, to raise companies' awareness in specific themes, such as sustainability and resilience. Indeed, big data analysis can provide footwear companies with useful considerations regarding the environmental impact of their production processes and of the material used, machines' quality and maintenance and supply chain management.

- Introduction to Big Data Analytics for Footwear Industry 5.0
- Data-driven Awareness in Consumers' Preferences
- Big Data Analytics in Footwear Industry 5.0 and Sustainability
- Big Data Analytics in Footwear Industry 5.0 and Production Optimization
- Big Data Analytics and Supply Chain Management

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UC/ULO 4

Networking & Coworking

With the implementation of Industry 5.0, new working realities emerge. Networking and coworking are gaining new impetus in what is an increasingly virtual and collaborative reality.

The aim of this unit is to raise awareness of these new terms, provide information on their main advantages, and learn about methods, strategies and tools for their implementation. For a clearer and more practical view of implementing these assumptions, this course also includes an analysis of best practices in companies and how they have been carried out.

- The Importance of Relationships
- Introduction to Networking
- Explore the Coworking
- Meeting Management

UC/ULO 5

Product Traceability & Supply Chain for Industry 5.0

Product traceability and supply chain management play a crucial role in applying Industry 5.0, particularly in footwear, and its impact on the recycling of raw materials. In this sector, RFID (Radio-Frequency Identification) technology has become an essential tool for tracking every step of the shoe production and distribution process. This not only increases efficiency but also has a profound effect on sustainability.

The implementation of RFID allows for precise tracking of the raw materials used in shoe manufacturing, from their origin to the finished product. This complete supply chain's visibility is invaluable for ensuring the provenance of recyclable materials and the authenticity of products. In Industry 5.0, product traceability and supply chain management, backed by RFID technology, drive circularity in footwear production. The ability to accurately trace and recycle shoe components such as soles, leather, and textiles significantly contributes to waste reduction and the conservation of natural resources. Furthermore, the detailed information obtained through RFID allows companies to make informed decisions on how to enhance sustainability throughout the footwear value chain.

- Introduction to Traceability and Sustainability in the Footwear Industry
- Traceability Technologies in the Footwear Industry
- Sustainable Supply Chain Management
- Sustainability Practices in Footwear Production
- Informed Decision-Making and the Future of the Footwear Industry

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UC/ULO 6

Artificial Intelligence (AI) in Footwear Industry 5.0

The use of AI in industrial processes has started to revolutionise the way footwear products are designed and manufactured, raising the levels of efficiency and innovation of the entire sector.

AI can result incredibly useful in numerous aspects of footwear production: in understating costumers' preferences, designing innovative and high-performance products, training and technology.

- Introduction to AI
- AI in Footwear Design and Prototyping
- AI application in Footwear Production Processes
- AI application in Business Models

UC/ULO 7

Manufacturing i5.0

Industry 5.0, built on the foundations of industry 4.0, brings new challenges and opportunities to manufacturing. Footwear, an historical traditional manufacturing industry, can benefit greatly with a new approach and new tools.

Manufacturing 5.0, here related to how things are made and the shop floor, comprehends the digitalization, industrial internet of things, automation and robotics, lean robotics, and energy efficiency.

The manufacturing for Industry 5.0 is deeply supported in the digitalization, allowing for a deep integration of the internet of things, lean manufacturing automated and robotized processes, particularly collaborative. Energy efficiency is determinant for sustainability and economical purposes.

This unit focuses on the technologies enabling manufacturing 5.0 in the shop floor for the footwear industry. It shows the advantages of using advanced technologies in manufacturing, including collaborative robots, the concepts of lean robotics, supported in digitalization in the world of connected devices. It will enable learners to understand and apply these Industry 5.0 concepts.

- Introduction to Manufacturing 5.0
- Digitalization and Internet of Things in Manufacturing
- Energy Efficiency in Manufacturing
- Lean Robotics and Collaborative Robotics

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UC/ULO 8
Co-Innovation 5.0

In footwear manufacturing, the shift towards innovation becomes imperative for the survival of SMEs amid today's disruptive landscape. Embracing co-innovation and collaborative approaches challenges the traditional mindset of competition, fostering growth within a global ecosystem. Co-innovation transcends mere collaboration; it strategically aligns different companies' expertise and experiences to generate value in products, services, and processes, involving shared risks and rewards. For these SMEs, partnering offers benefits ranging from expanding networks to accessing new talent and funding, accelerating growth and increasing global reach. In this process, SMEs can adopt various stages of innovation, including open innovation, co-creation, and coopetition, before reaching a stage of co-innovation. This unit of competences aims to guide SMEs, particularly in sectors like footwear, textile, wood and furniture, logistics, and chemistry, towards digital and green transformation, aligning with the objectives of Industry 5.0.

- Paving the Way for Co-Innovation
- Open-Source Resources
- Identify Collaboration Challenges between Companies, Sectors, Industries
- Apply Collaboration Tools and Techniques

UC/ULO 9
Corporate Social Responsibility for Footwear Industry 5.0

Corporate Social Responsibility (CSR) in the footwear industry refers to the ethical and sustainable practices that footwear companies adopt to ensure they have a positive impact on society, the environment, and people. It involves taking responsibility beyond purely economic goals and striving for a balance between profit-making and contributing to social and environmental well-being.

This unit focuses on integrating CSR principles within the context of Industry 5.0 (i5.0) specifically tailored for the footwear industry. It explores the concepts of openness, transparency, and ethics in the context of business operations, supply chain, and stakeholders' engagement. The unit equips learners with the knowledge and skills necessary to align modern manufacturing processes with ethical and sustainable practices, fostering responsible innovation and value creation.

- Introduction to CSR for Footwear Industry 5.0
- Ethical Considerations in Footwear Industry 5.0
- Transparency Considerations in Footwear Industry 5.0
- Openness, Collaboration, and Responsible Innovation
- Integration of CSR in Organizational Practices

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UC/ULO 10

Ergonomics and Digital Anthropology

This unit explores the dynamic intersection of ergonomic principles and digital anthropology within the context of Industry 5.0 (i5.0) in footwear production. It equips learners with the knowledge and practical insights to optimize workplace design, foster human-centered digital environments, and promote occupational health and safety in the footwear manufacturing industry. By examining how ergonomic considerations and digital practices intersect, learners gain a holistic understanding of creating a work culture that prioritizes well-being and efficiency.

- Introduction to Ergonomics and Workplace Design
- Digital Anthropology and Work-Related Digital Interactions
- Technology Integration and Human-Centered Work Environments
- Culture of Occupational Health and Safety in Footwear Manufacturing

UC/ULO 11

Bio-Inspired Materials and Technologies

This unit offers an in-depth exploration of the integration of bio-inspired materials and technology within the footwear industry. Learners will explore the principles, benefits, and applications of biomimetic design, bio-based materials, and advanced manufacturing techniques in footwear production. It also emphasizes sustainable and innovative approaches to footwear design and manufacturing, drawing inspiration from nature's ingenious solutions.

Moreover, it presents the potential of various bio-inspired concepts for footwear, such as self-healing or self-repairing properties, lightweight compositions, recyclability, material generation from waste, integration of living materials, embedded sensor technologies and biosensors, adaptive/responsive ergonomics, surface properties, as well as materials with intrinsic traceability.

The unit showcases the integration of living materials, sensor technologies, and adaptive ergonomics, infusing footwear with dynamic functionalities.

- Introduction to Bio-Inspired Materials & Technology in Footwear Industry
- Biomimetic Design
- Bio-Inspired Materials for Footwear
- Bio-Based Materials and Bio-Inspired Structures for Footwear Components
- Biomimetic Advanced Technologies in Footwear Manufacturing

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UC/ULO 12
Wellbeing in Industry 5.0

The human-centered approach characterized by Industry 5.0 is a result of the society's concern about the wellbeing of workers, and the best use of machines and robots. By taking on heavier tasks, consequent of the increase managers' concern about the physical safety of employees, other dimensions of their wellbeing are emerging.

The growing understanding of the concept of wellbeing as a more holistic approach that encompasses the physical safety of workers as well as psychological and emotional wellbeing, require a greater commitment from human resource managers and directors to provide a healthier environment in the three aspects mentioned above.

This unit aims to explain the concept of wellbeing in the workplace, covering the 3 dimensions inherent to it, physical, emotional and psychological wellbeing, as well as exploring some of the nuances associated with each of them, and how to boost wellbeing in the workplace for more motivation, happiness and greater productivity.

- Wellbeing at Work
- Physical Wellbeing
- Psychological Wellbeing
- Emotional Wellbeing

UC/ULO 13
Circular Design, Smart Materials and Innovative Processes in Footwear Industry 5.0

This units sparks from the recognition of the large environmental impact of the footwear industry. Currently, many consumers but, above all, consumers' present an important lack of knowledge and capabilities about how to properly manage shoes' disposal, recycling and re-use. Improving sustainable circular design will affect not only footwear production, but also the overall impact of the industry on the environment by enhancing sustainability and innovation.

The introduction of Smart Material in footwear production will be a milestone in reducing the sector's impact on the environment, but it will also impact products' performances, durability, and design. Smart Materials, together with Innovative Processes will boost the overall growth of the footwear industry by opening new opportunities for businesses, education, training, and economic development.

- The Environmental Impact of the Footwear Industry
- Circular Design
- Introducing Smart Materials in Footwear Production
- Introduction of Innovative Processes in the Footwear Sector

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UC/ULO 14

Management for Technological Changes

In a constantly evolving business world, effective management of technological changes has become a critical priority for the sustainable success of footwear companies. This training unit is specifically designed to equip footwear leaders and managers with the skills to adapt and embrace the latest technologies in Industry 5.0. This new era represents a revolution in manufacturing, driven by the interconnection of cyber-physical systems, AI, and automation, and is essential for maintaining competitiveness in the global market.

During this training, participants will explore key strategies for identifying the opportunities and challenges that Industry 5.0 presents in the footwear sector. They will learn to assess the specific technological needs of their organizations and develop skills to lead successful digital transformation projects. From adopting intelligent production systems to implementing IoT (Internet of Things) solutions in the supply chain and optimizing the customer experience, this training unit will provide the necessary tools for making informed and strategic decisions.

- Introduction to Industry 5.0 and Its Impact on Footwear
- Assessment and Adoption of Technologies in the Footwear Sector
- Leadership in Footwear Digital Transformation
- Best Practices and Innovation Culture in the Footwear Industry

UC/ULO 15

Ultra and Mass Customisation

Ultra-customisation means the ability to manufacture products that are tailored to the specific needs of individual customers. This can be connected with mass customization as the ability to manufacture goods or services in large quantities while still meeting the specific individual customers' needs.

This is possible by using advanced technologies such 3D printing and other customisation technologies, robotics, and AI.

Industry 5.0 is characterized by the use of these advanced technologies to create more efficient, sustainable, and human-centric manufacturing processes. Mass customisation is a key trend in Industry 5.0 because it allows manufacturers to meet the growing demand for personalised products while still maintaining the efficiency and cost-effectiveness of mass production.

This unit focuses on the technologies enabling mass and ultra-customisation for the footwear industry. It shows the advantages, challenges, and opportunities of the use of customisation in this industry. It will enable learners to understand and apply these concepts embracing Industry 5.0 objectives.

- Introduction to Product Mass and Ultra-Customisation
- Technologies for Ultra-Customisation
- AI Customisation
- Automation and Robotics for Customisation

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Training pathways

The **training pathways** aim to support the upskill programme. The **training pathway matrix** presented below has been designed to better understand the **correlation** between the **customised training plan** comprising 15 Units of Competence/Learning Outcomes and the **5 key profiles** identified in Task 2.2 as important for Footwear Industry 5.0. The GREEN colour indicates UC/ULOs that are highly relevant to a profile, YELLOW highlights optional units, and GREY highlights units that are not relevant for specific profiles.

Since each UC/ULO is assigned a **standalone number of micro-credentials** (4 micro-credentials), they can be grouped differently in **customised training pathways** according to the chosen **profile**, **required skills** and **existing learner skills**.

By aligning the significance of each UC/ULO with the selected key profiles, **5 training pathways** are proposed. These paths cover highly relevant and optional topics to each of the 5 key profiles, aiming to enhance their knowledge and skills in the context of Footwear Industry 5.0.

Each training pathway includes information about the profile, the minimum number of micro-credentials, training hours, and mandatory and optional training units.

Legend:	
Very relevant	
Optional	
Not relevant	

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	List of UC / ULOs	Developer partner	Profiles				
			Footwear technical manager	*Footwear manufacturing operator*	*Footwear designer / pattern maker*	*Maintenance technician*	*I5.0 Footwear Architect*
1	*Management of Human Resources for Industry 5.0*	*EDIT VALUE*					
2	*Programming using Block Language*	*CTCR*					
3	*Big Data in Footwear Industry 5.0*	*POLICALZ*					
4	*Networking & Coworking*	*EDIT VALUE*					
5	*Product Traceability & Supply Chain for Industry 5.0*	*CTCR*					
6	*Artificial Intelligence (AI) in Footwear Industry 5.0*	*POLICALZ*					
7	*Manufacturing i5.0*	*CTCP*					
8	*Co-innovation 5.0*	*CTCP*					
9	*Corporate Social Responsibility for Footwear Industry 5.0*	*TUIASI*					
10	*Ergonomics and Digital Anthropology*	*TUIASI*					
11	*Bio-Inspired Materials and Technologies*	*TUIASI*					
12	*Wellbeing in Industry 5.0*	*EDIT VALUE*					
13	*Circular Design, Smart Materials and Innovative Processes in Footwear Industry 5.0*	*POLICALZ*					
14	*Management for Technological Changes*	*CTCR*					
15	*Ultra and Mass Customisation*	*CTCP*					

Training pathways matrix

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Training pathway 1: Footwear Technical Manager

Footwear Technical Manager

The Footwear Technical Manager is a professional responsible for managing the technical information in the Footwear development process. He/she is responsible for creating technical information and collaborating with all departments to provide an effective transition of footwear designs into prototypes through Commercialisation.

Number of micro-credentials: **min. 20**

Number of training hours: **500 h**

Mandatory

UC/ULO 1
Management of Human Resources for Industry 5.0

UC/ULO 4
Networking & Coworking

UC/ULO 7
Manufacturing i5.0

UC/ULO 9
Corporate Social Responsibility for Footwear Industry 5.0

UC/ULO 14
Management for Technological Changes

Nice to have it

UC/ULO 6
AI in Footwear Industry 5.0

UC/ULO 10
Ergonomics and Digital Anthropology

UC/ULO 12
Wellbeing in Industry 5.0

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Training pathway 2: Footwear Manufacturing Operator

Footwear Manufacturing Operator

The Footwear Manufacturing Operator oversees production equipment before, during, and after manufacturing. As a manufacturing operator, his/her duties are to implement cut, stitch, assembly, finish, test and inspect for issues, operate during production, and ensure all safety procedures are followed.

Number of micro-credentials: **min. 8**

Number of training hours: **200 h**

Mandatory

UC/ULO 7
Manufacturing i5.0

UC/ULO 14
Management for Technological Changes

Nice to have it

UC/ULO 4
Networking & Coworking

UC/ULO 6
AI in Footwear Industry 5.0

UC/ULO 10
Ergonomics and Digital Anthropology

UC/ULO 12
Wellbeing in Industry 5.0

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Training pathway 3: Footwear Designer / Pattern Maker

Footwear Designer/ Pattern Maker

The Footwear Designer/Pattern Maker is responsible for all shoe design aspects. The designer must consider the styling, materials, colours, customers, price, trends, and product performance. The pattern maker, moreover, is responsible for creating the proportioned pattern that fits tight to the last, following the indication set up by the designer.

Number of micro-credentials: **min. 24**

Number of training hours: **600 h**

Mandatory

- **UC/ULO 5** — Product Traceability & Supply Chain for Industry 5.0
- **UC/ULO 6** — Artificial Intelligence (AI) in Footwear Industry 5.0
- **UC/ULO 8** — Co-innovation 5.0
- **UC/ULO 11** — Bio-Inspired Materials and Technologies
- **UC/ULO 13** — **Design, Smart Materials and Innovative Processes**
- **UC/ULO 15** — Ultra and Mass-Customisation

Nice to have it

- **UC/ULO 4** — Networking & Coworking
- **UC/ULO 7** — Manufacturing i5.0
- **UC/ULO 9** — Corporate Social Responsibility for Footwear Industry 5.0
- **UC/ULO 10** — Ergonomics and Digital Anthropology
- **UC/ULO 14** — Management for Technological Changes

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Training pathway 4: Maintenance Technician

Maintenance Technician

The Maintenance Technician performs routine maintenance of equipment, machinery and manufacturing facilities and helps troubleshoot and repair any mechanical or electrical problems when they arise. He/she performs preventative maintenance and emergency maintenance. In a manufacturing or industrial setting, he/she helps troubleshoot and quickly repair any mechanical, hydraulic, pneumatic or electrical problems should they arise with the manufacturing processes and supporting equipment and systems in the facility.

Number of micro-credentials: **min. 12**

Number of training hours: 3**00 h**

Mandatory

- **UC/ULO 2** — Programming using Block Language
- **UC/ULO 3** — Big Data in Footwear Industry 5.0
- **UC/ULO 7** — Manufacturing i5.0

Nice to have it

- **UC/ULO 4** — Networking & Coworking
- **UC/ULO 6** — AI in Footwear Industry 5.0

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Training pathway 5: i5.0 Footwear Architect

i5.0 Footwear Architect

The 5.0 Footwear Architect is a professional with skills, knowledge and attitudes linked to Industry 5.0 topics. It is a newly created profile that collects the transformation needs linked to Industry 5.0 and connects them with the skills and knowledge related to the footwear sector. He/she works in footwear companies, and she/he specialises in the interaction of machines and operators and has expertise in robotics and AI.

Number of micro-credentials: **min. 36**

Number of training hours: **900 h**

Mandatory

- **UC/ULO 2** Programming using Block Language
- **UC/ULO 3** Big Data in Footwear Industry 5.0
- **UC/ULO 4** Networking &
- **UC/ULO 5** Product Traceability & Supply Chain for Industry 5.0
- **UC/ULO 6** Artificial Intelligence (AI) in Footwear Industry 5.0
- **UC/ULO 7** Manufacturing i5.0
- **UC/ULO 8** Co-innovation 5.0
- **UC/ULO 9** Corporate Social Responsibility for Footwear Industry 5.0
- **UC/ULO 12** Wellbeing in Industry 5.0

Nice to have it

- **UC/ULO 1** Networking & Coworking
- **UC/ULO 10** Ergonomics and Digital Anthropology
- **UC/ULO 11** Bio-Inspired Materials and Technologies
- **UC/ULO 13** Circular Design, Smart Materials and Innovative Processes
- **UC/ULO 14** Management for Technological Changes
- **UC/ULO 15** Ultra and Mass Customisation

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Scanning tool

The **scanning tool**, accessible on the project website Shoe 5.0 - Partnership for Footwear Industry 5.0 Readiness (shoe50.eu), is a tool designed to gather information **regarding training needs in footwear manufacturing skills and knowledge**. It customises a training pathway for each learner by providing a map of skills and their current status. It guides them through a tailored training itinerary based on selected profile, their needs, motivations, and interests.

At the core of the **scanning tool** is a questionnaire structured around the relationship between profile activities, required skills and existing skills.

Once the learner completes the questionnaire, the tool aligns with specific UC/ULOs. The questionnaire is organised into quadrants linked to UC/ULOs (training units):

- *Management of HR for i5.0*
- *Programming using Block Language*
- *Big Data (analytics)*
- *Networking & Coworking*
- *Product Traceability & Supply Chain for i5.0*
- *Artificial Intelligence (AI) in the Footwear Industry*
- *Manufacturing i5.0*
- *Co-innovation 5.0*
- *CSR for i5.0 (Openness, Transparency, Ethics)*
- *Ergonomics and Digital Anthropology (Health, Safety)*
- *Bio-Inspired Materials & Technology*
- *Wellbeing in i5.0*
- *Circular Design / Materials / Smart Material / Processes*
- *Management for Technological Changes*
- *Product Ultra-Customisation*

Each quadrant, representing a UC/ULO, comprises four questions with four response options and a score. The learner's selected responses translate to numerical values. The total score from the four questions per quadrant ranges from 0 to 12, visually represented on a spiderweb diagram.

Furthermore, the tool **offers guidance** on a learner's specific **training pathway** based on their **current profile** or **desired evolution**. Depending on the chosen profile, the scanning tool will suggest the **mandatory** and **optional** UC/ULOs for the profile based on the **5 training pathways** presented in the previous section.

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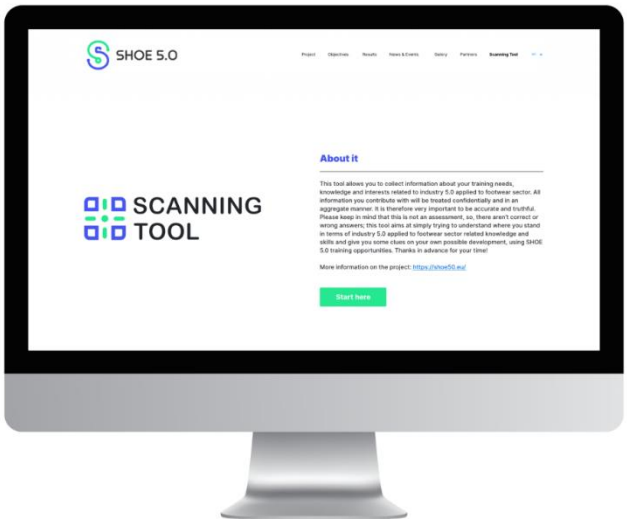
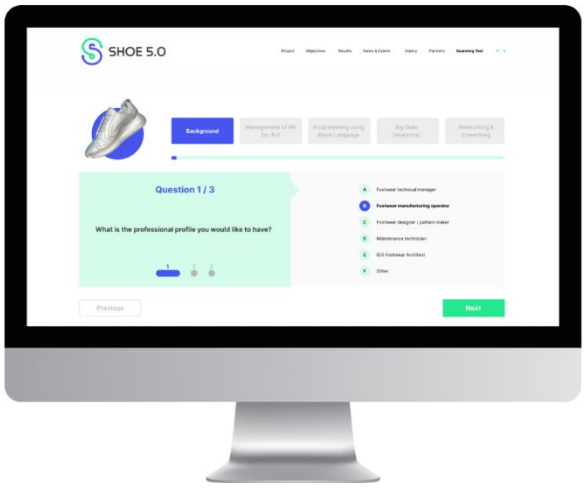
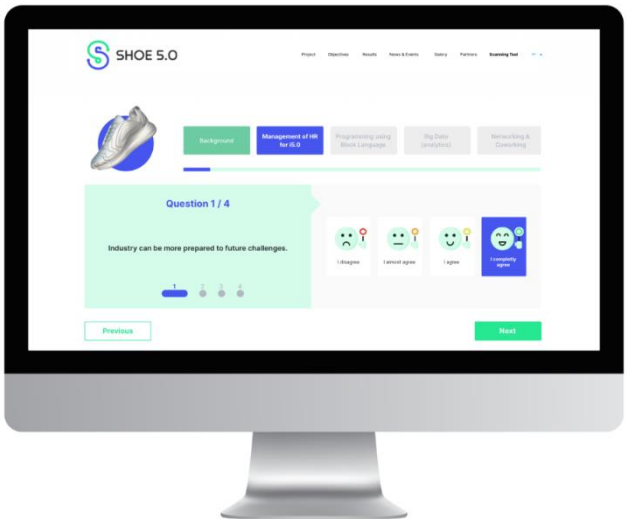


General information about the Scanning Tool



Step 1. Background information about the learner



Step 2. Evaluation of the UC/ULOs relevance for the learner

Step 3. Result generation (customised training pathway)

Upon completing each training unit, learners must complete an evaluation questionnaire. After submission, they will receive a certificate confirming their successful completion and acquisition of the knowledge and skills associated with the UC/ULO. Upon completing the mandatory group of units specified for a particular profile, as outlined in the **training pathways section**, learners will be awarded an upskilling certificate corresponding to their selected profile.

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Conclusions

In conclusion, this document outlines the **upskilling schemes** related to Industry 5.0, highlighting the minimum learning objectives requisite for job profiles within this domain. By aligning with the **5 profiles** (Footwear Technical Manager; Footwear Manufacturing Operator; Footwear Designer/Pattern Maker; Maintenance Technician; and the NEW profile of the i5.0 Footwear Architect), integrating **customised training plans** based on 15 UC/ULOs and implementing the **scanning tool**, this framework serves as a cornerstone for establishing various training pathways and requisite contents tailored to the evolving demands of Industry 5.0.

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