SHOE 5.0

2022-1-PT01-KA220-VET-000088122

Work Package 2 –

2.4 Scanning Tool

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Introduction to the Scanning Tool

The scanning tool is an electronic device available on the project website that allows to collect information about training needs on footwear manufacturing related skills and knowledge and design a possible training path, customized to each user. This tool provides the user with a map of skills and correspondent state-of-play and orient the user to follow a training itinerary according to his/her needs, motivations, interests.

It can be found in the project website: Shoe 5.0 - Partnership for Footwear Industry 5.0 Readiness (shoe50.eu)

The central component of the Scanning tool consists in a questionnaire built on the relationship between "professional profile" / "needed skills" / "existing skills" / "orientation to Unit of Learning Outcome". Once the questionnaire is completed, the tool presents a tailored training pathway composed of the most relevant Units of Learning Outcomes (ULOs). The questions are organised within the following quadrants, each linked to specific Training Units (Units of Learning Outcomes – ULOs):

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

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Each quadrant (correspondent to each training Unit / Learning Outcome) has 4 questions. Each question (which has 4 options each) has a score, as suggested below. The response selected by the respondent (the user) corresponds to a value. The total of the 4 questions answered per quadrant corresponds to a value that can go from 0 to 12, a value that will be marked on the diagram (spiderweb diagram).

Moreover, the tool can also give guidance on the specific training path according to the profile the user belongs to or want to evolve too.

A weighting coefficient will be assigned to the quadrants (ULOs) directly related to each profile the user is closer to or wants to be, in a career evolution perspective., according to the table below:

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	List of 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*					

Legend:
Very relevant
Optional
Not relevant

Legend:
Very relevant
Optional
Not relevant

edit value apoio à gestão
byAR
European Footwear Confederation
ctcp centro tecnológico do calçado de portugal
CTCR
POLITECNICO CALZATURIERO
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For instance: withing the profile Designer/Patter Making, the groups of questions related to the UOLs 5, 6, 8, 11, 13 and 15 will have a weighting coefficient of 2x (double importance, "must have"), the ULOs 4, 7, 9, 10 and 14 a coefficient of 1,5x ("good to have") and the other only 1x (always important for update).

After the completion and submission of the questionnaire duly filled out, the tool should provide an alert on the need to act in each of the above quadrants.

This tool, therefore, comprehends the following components:

A – Questionnaire on training needs

Available in the section below

B -Scanning tool

This is available in the project website [Shoe 5.0 - Partnership for Footwear Industry 5.0 Readiness (shoe50.eu)]

Here below an example of the functioning of the scanning tool:

1st – The user completes the questionnaire

2nd - The tool should display the values obtained in each quadrant, in a spider web diagram or equivalent.

Example for the quadrant " **Manufacturing i5.0**"

The user will be asked to rate each statement on a four-point scale — *I disagree*, *I almost agree*, *I agree*, *I completely agree* — corresponding respectively to values from 0 to 4, which are then used for graphical and analytical processing (e.g. radar charts).

Question	Rank
Manufacturing 5.0, built upon the foundations of Industry 4.0, offers innovative approaches and tools to address the challenges faced by the traditional footwear industry.	I disagree
	I almost agree
	I agree
	I completely agree
	I disagree
	I almost agree
	I agree

The footwear industry, with its focus on cost reduction, sustainability, and personalized products, can significantly benefit from the adoption of Manufacturing 5.0 principles.	I completely agree
Manufacturing 5.0 encompasses digitalization, the Industrial Internet of Things (IIoT), automation and robotics, lean manufacturing, and energy efficiency, providing a holistic approach to modernizing production processes.	I disagree **I almost agree** I agree I completely agree
The integration of digital technologies, lean manufacturing principles, and collaborative robotics enabled by Industry 5.0 can lead to substantial improvements in efficiency, sustainability, and product customization in the footwear industry.	**I disagree** I almost agree I agree I completely agree
	5

Same procedure for other groups / other Units:

Example of a final diagram:

- Management of Human Resources for Industry 5.0 - 5
- Programming using Block Language - 8
- Big Data in Footwear Industry 5.0 - 0
- Networking & Coworking - 1
- Product Traceability & Supply Chain for Industry 5.0 - 6
- Artificial Intelligence (AI) in Footwear Industry - 3
- Manufacturing i5.0 - 4
- Co-innovation 5.0 - 4
- Corporate Social Responsibility for Footwear Industry 5.0 - 4
- Ergonomics and Digital Anthropology - 6
- Bio Inspired Materials and Technologies - 4
- Wellbeing in Industry 5.0 - 1
- Circular Design, Smart Materials and Innovative Processes in Footwear Industry - 6
- Management for Technological Changes - 6

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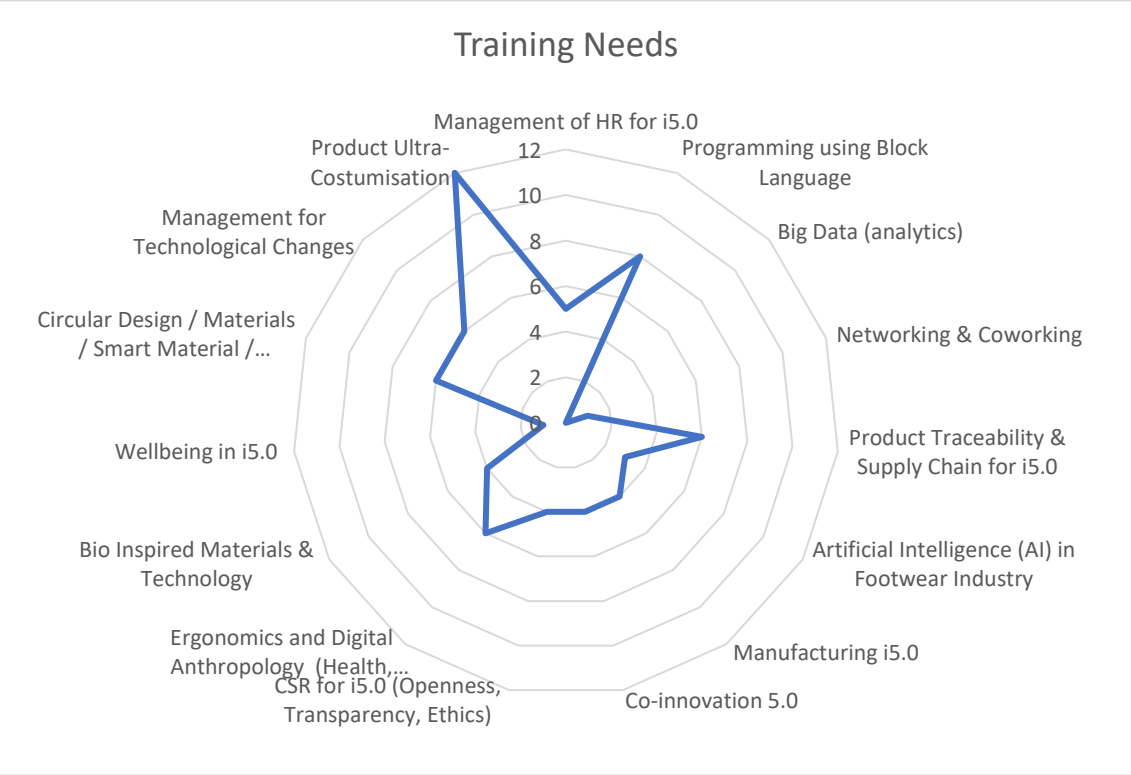
- Ultra and Mass Customisation - 12



In the diagram it should appear indications on how to act in the future and take advantage of the results /products of the project.

So according to the report:

- Scoring below 5 points -> Need to raise awareness. Opportunities for development through the study of the training units / possibility for growth through acquiring knowledge
- Scoring between 5 and 10 points -> training can improve the awareness levels, enhance already existing skills and acquire knowledge
- Scoring higher than 10 points -> training will complement the already existing skills acquired knowledge - training will complement the already acquired knowledge. Possibility for growth through acquiring knowledge

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In this example:

Management of Human Resources for Industry 5.0	5	training can improve the awareness levels, enhance already existing skills and acquire knowledge
Programming using Block Language	8	training can improve the awareness levels, enhance already existing skills and acquire knowledge
Big Data in Footwear Industry 5.0	0	Need to raise awareness. Opportunities for development through the study of the training units / possibility for growth through acquiring knowledge
Networking & Coworking	1	Need to raise awareness. Opportunities for development through the study of the training units / possibility for growth through acquiring knowledge
Product Traceability & Supply Chain for Industry	6	training can improve the awareness levels, enhance already existing skills and acquire knowledge
Artificial Intelligence (AI) in Footwear Industry	3	Need to raise awareness. Opportunities for development through the study of the training units / possibility for growth through acquiring knowledge
Manufacturing i5.0	4	Need to raise awareness. Opportunities for development through the study of the training units / possibility for growth through acquiring knowledge
Co-innovation 5.0	4	Need to raise awareness. Opportunities for development through the study of the training units / possibility for growth through acquiring knowledge
Corporate Social Responsibility for Footwear Industry 5.0	4	Need to raise awareness. Opportunities for development through the study of the training units / possibility for growth through acquiring knowledge
Ergonomics and Digital Anthropology	6	training can improve the awareness levels, enhance already existing skills and acquire knowledge
Bio Inspired Materials and Technologies	4	Need to raise awareness. Opportunities for development through the study of the training units / possibility for growth through acquiring knowledge

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Wellbeing in i5.0	1	Need to raise awareness. Opportunities for development through the study of the training units / possibility for growth through acquiring knowledge
Circular Design, Smart Materials and Innovative Processes in Footwear Industry 5.0	6	training can improve the awareness levels, enhance already existing skills and acquire knowledge
Management for Technological Changes	6	training can improve the awareness levels, enhance already existing skills and acquire knowledge
Ultra and Mass Customisation	12	training will complement the already existing skills - training will complement the already acquired knowledge. Possibility for growth through acquiring knowledge.

The tool can and should be used with orientation of the trainer, teacher and the results analysed together with the trainee or student to, altogether, design the most adequate training itinerary, in case the user doesn't want or doesn't need to take the whole course/qualification. The role of the trainer, teacher is important in this case. But it can stand alone and to be a self-orientation tool.

The tool will reorient the user to a page where all the modules are described, for him/her to understand what is possible to find in the Shoe 5.0 contents.

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Questionnaire

This tool allows you to collect information about your training needs, knowledge and interests related to industry 5.0 applied to footwear sector. All information you contribute with will be treated confidentially and in an aggregate manner. It is therefore very important to be accurate and truthful. Please keep in mind that this is not an assessment, so, there aren't correct or wrong answers; this tool aims at simply trying to understand where you stand in terms of industry 5.0 applied to footwear sector related knowledge and skills and give you some clues on your own possible development, using SHOE 5.0 training opportunities. Thanks in advance for your time!

More information on the project: https://shoe50.eu/

Background

1. What is your professional profile closer to?

○ Footwear technical manager

○ Footwear manufacturing operator

○ Footwear designer / pattern maker

○ Maintenance technician

○ I5.0 Footwear Architect*

○ Other

* The i5.0 Footwear Architect is a professional that has skills, knowledge and attitudes linked to Industry 5.0 topics. It is a newly created profile, which collects the needs of the transformation linked to Industry 5.0 and connects them with the skills and knowledge related to the footwear sector. The Footwear Architect works in the Footwear companies, and she/he specializes in the interaction of machines and operators, as well as having expertise in robotics and artificial intelligence.

2. Where do you come from?

○ Portugal

○ Italy

○ Spain

○ Romania

○ Other.

3. What's your expectation regarding this training?

○ To know more about i5.0 applied to footwear

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○ To know more about footwear manufacturing now with a view of i5.0

○ To improve my knowledge and skills as a support for career progression

○ To change career withing footwear industry, now with a view of i5.0

○ Other.

Management of HR for i5.0

Effective people management is crucial in the implementation of Industry 5.0 to navigate the complexities of diverse workforces, dispersed teams, and technological advancements.

I disagree	I almost agree	I agree	I completely agree

Aligning employees with organizational values and culture fosters adaptability and resilience in the face of change and external market volatility.

I disagree	I almost agree	I agree	I completely agree

Developing transversal skills, such as communication, problem-solving, and emotional intelligence, is essential for employees to thrive in the rapidly evolving workplace of Industry 5.0.

I disagree	I almost agree	I agree	I completely agree

Human resource management practices must evolve to embrace the human-centred approach of Industry 5.0, recognizing the value of human talent and expertise amidst the integration of AI and automation.

I disagree	I almost agree	I agree	I completely agree

Programming using Block Language

Block-based programming languages are more intuitive and easier to learn than traditional text-based programming languages.

I disagree	I almost agree	I agree	I completely agree

The visual nature of block-based programming makes it more engaging and accessible to learners with different learning styles.

I disagree	I almost agree	I agree	I completely agree

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Block-based programming can be used to create complex and sophisticated programs, not just simple games and animations.

I disagree	I almost agree	I agree	I completely agree

Block-based programming can be a valuable stepping stone for learners who want to learn traditional text-based programming languages.

I disagree	I almost agree	I agree	I completely agree

Big Data in Footwear Industry 5.0

Big data analytics can be used to gain insights into consumer preferences and market trends, helping footwear companies make informed decisions about product development and marketing.

I disagree	I almost agree	I agree	I completely agree

Big data analytics can be used to improve sustainability and resilience in the footwear industry by identifying opportunities for reducing environmental impact, improving supply chain efficiency, and enhancing product durability.

I disagree	I almost agree	I agree	I completely agree

Big data analytics can be used to optimize production processes and resource allocation, leading to improved efficiency and cost savings.

I disagree	I almost agree	I agree	I completely agree

Big data analytics can be used to enhance quality control and maintenance of machinery, reducing defects and downtime.

I disagree	I almost agree	I agree	I completely agree

Networking & Coworking

Networking and coworking are becoming increasingly important in Industry 5.0 due to the shift towards virtual and collaborative work environments.

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I disagree	I almost agree	I agree	I completely agree

Networking can help professionals expand their professional networks, identify new opportunities, and stay up-to-date on industry trends.

I disagree	I almost agree	I agree	I completely agree

Coworking spaces provide a shared workspace and collaborative environment that can foster innovation and productivity.

I disagree	I almost agree	I agree	I completely agree

Companies can implement networking and coworking strategies to enhance employee engagement, knowledge sharing, and innovation.

I disagree	I almost agree	I agree	I completely agree

Product Traceability & Supply Chain for i5.0

Product traceability and supply chain management are essential for enabling circularity in the footwear industry.

I disagree	I almost agree	I agree	I completely agree

RFID technology is a valuable tool for tracking the movement of raw materials and finished products in the footwear supply chain.

I disagree	I almost agree	I agree	I completely agree

The use of RFID technology can help to drive circularity in footwear production by enabling the accurate tracing and recycling of shoe components.

I disagree	I almost agree	I agree	I completely agree

The detailed information obtained through RFID can help companies to make informed decisions on how to enhance sustainability throughout the footwear value chain.

I disagree	I almost agree	I agree	I completely agree

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Artificial Intelligence (AI) in Footwear Industry 5.0

AI can significantly enhance the efficiency and innovation of footwear production processes.

I disagree	I almost agree	I agree	I completely agree

AI can be used to gain a deeper understanding of consumer preferences, leading to more tailored footwear designs.

I disagree	I almost agree	I agree	I completely agree

AI can be employed to develop innovative and high-performance footwear products, catering to the evolving demands of consumers.

I disagree	I almost agree	I agree	I completely agree

AI can be utilized to enhance training and technology within the footwear industry, empowering workers and optimizing operations.

I disagree	I almost agree	I agree	I completely agree

Manufacturing i5.0 (Energy Efficiency, Lean Robotics, ….)

Manufacturing 5.0, built upon the foundations of Industry 4.0, offers innovative approaches and tools to address the challenges faced by the traditional footwear industry.

I disagree	I almost agree	I agree	I completely agree

The footwear industry, with its focus on cost reduction, sustainability, and personalized products, can significantly benefit from the adoption of Manufacturing 5.0 principles.

I disagree	I almost agree	I agree	I completely agree

Manufacturing 5.0 encompasses digitalization, the Industrial Internet of Things (IIoT), automation and robotics, lean manufacturing, and energy efficiency, providing a holistic approach to modernizing production processes.

I disagree	I almost agree	I agree	I completely agree

The integration of digital technologies, lean manufacturing principles, and collaborative robotics enabled by Industry 5.0 can lead to substantial improvements in efficiency, sustainability, and product customization in the footwear industry.

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I disagree	I almost agree	I agree	I completely agree

Co-innovation 5.0

Co-innovation is a strategic approach to innovation that involves collaboration between different organizations or stakeholders to create new and valuable products, services, or processes.

I disagree	I almost agree	I agree	I completely agree

Co-innovation can help traditional industries like the footwear industry to overcome challenges and seize opportunities in a rapidly changing environment.

I disagree	I almost agree	I agree	I completely agree

Open innovation, co-creation, and coopetition are all intermediate stages that companies can experiment with before reaching a fully co-innovative level.

I disagree	I almost agree	I agree	I completely agree

The footwear industry can benefit from co-innovation by collaborating with other industries, such as textiles, furniture/upholstery, logistics, and chemistry, to share solutions and expertise.

I disagree	I almost agree	I agree	I completely agree

Corporate Social Responsibility for Footwear Industry 5.0 (Openness, Transparency, Ethics)

Corporate Social Responsibility (CSR) is essential for the sustainability of the footwear industry in the long run.

I disagree	I almost agree	I agree	I completely agree

Industry 5.0 (i5.0) provides a framework for integrating CSR principles into footwear manufacturing processes.

I disagree	I almost agree	I agree	I completely agree

Openness, transparency, and ethics are crucial for upholding CSR standards in the footwear industry.

I disagree	I almost agree	I agree	I completely agree

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Aligning modern manufacturing processes with ethical and sustainable practices is essential for responsible innovation and value creation.

I disagree	I almost agree	I agree	I completely agree

Ergonomics and Digital Anthropology (Health, Safety)

Ergonomics principles can be effectively applied to footwear manufacturing processes to enhance worker well-being and productivity.

I disagree	I almost agree	I agree	I completely agree

Digital anthropology can be used to understand the cultural and social factors that influence workplace design and ergonomics in footwear production.

I disagree	I almost agree	I agree	I completely agree

By integrating ergonomics and digital anthropology, footwear companies can create human-cantered digital environments that promote both worker well-being and operational efficiency.

I disagree	I almost agree	I agree	I completely agree

Industry 5.0 (i5.0) provides a framework for leveraging ergonomics and digital anthropology to optimize workplace design, foster a positive work culture, and enhance occupational health and safety in the footwear manufacturing industry.

I disagree	I almost agree	I agree	I completely agree

Bio Inspired Materials & Technology

Biomimetic design, bio-based materials, and advanced manufacturing techniques offer innovative and sustainable solutions for footwear production.

I disagree	I almost agree	I agree	I completely agree

Nature's ingenious solutions can provide inspiration for developing self-healing or self-repairing properties, lightweight compositions, and recyclable footwear materials.

I disagree	I almost agree	I agree	I completely agree

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The integration of living materials, sensor technologies, and adaptive ergonomics can revolutionize footwear design and functionality.

I disagree	I almost agree	I agree	I completely agree

Advanced manufacturing techniques, such as 3D printing and additive manufacturing, are enabling the creation of footwear products inspired by nature's designs and functionalities.

I disagree	I almost agree	I agree	I completely agree

Wellbeing in i5.0

The human-centred approach of Industry 5.0 has brought a renewed focus on the importance of employee wellbeing.

I disagree	I almost agree	I agree	I completely agree

Physical safety is no longer the sole concern for employee wellbeing in Industry 5.0.

I disagree	I almost agree	I agree	I completely agree

Human resource managers and directors have a responsibility to provide a healthy environment for all three dimensions of wellbeing.

I disagree	I almost agree	I agree	I completely agree

A holistic approach to wellbeing encompassing physical, emotional, and psychological aspects is crucial in Industry 5.0.

I disagree	I almost agree	I agree	I completely agree

Circular Design, Smart Materials and Innovative Processes in Footwear Industry 5.0

The footwear industry has a significant environmental impact and needs to adopt sustainable circular design practices.

I disagree	I almost agree	I agree	I completely agree

Introducing smart materials into footwear production can enhance sustainability, durability, and design.

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I disagree	I almost agree	I agree	I completely agree

Adopting innovative processes alongside smart materials will boost the growth of the footwear industry.

I disagree	I almost agree	I agree	I completely agree

The footwear industry has a responsibility to educate consumers about sustainable disposal, recycling, and reuse of footwear.

I disagree	I almost agree	I agree	I completely agree

Management for Technological Changes

Effective management of technological change is essential for ensuring a smooth transition to Industry 5.0.

I disagree	I almost agree	I agree	I completely agree

Businesses need to develop strategies for upskilling and reskilling their workforce to adapt to the new technological landscape.

I disagree	I almost agree	I agree	I completely agree

Open innovation platforms and collaboration with external partners can help businesses to navigate the complexities of technological change.

I disagree	I almost agree	I agree	I completely agree

Continuous learning and adaptation are key to success in an environment of rapid technological change:

I disagree	I almost agree	I agree	I completely agree

Product Ultra-Customization

Ultra-customization and mass customization are emerging trends in the footwear industry, driven by the increasing demand for personalized products and the power of advanced technologies.

I disagree	I almost agree	I agree	I completely agree

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3D printing, robotics, and artificial intelligence are enabling footwear manufacturers to offer personalized products at scale, meeting the needs of individual customers while maintaining efficiency and cost-effectiveness.

I disagree	I almost agree	I agree	I completely agree

Mass customization offers footwear companies a competitive advantage by allowing them to differentiate their products, improve fit and comfort, and cater to the diverse needs of their customers.

I disagree	I almost agree	I agree	I completely agree

Industry 5.0 emphasizes the use of advanced technologies to create more efficient, sustainable, and human-centric manufacturing processes, making mass customization a key strategy for footwear companies in the future.

ustomers.

I disagree	I almost agree	I agree	I completely agree

Anything you would like to communicate to SHOE 5.0 project partners:

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