Innovative Skills for an Old Vocation

Comparative report of future trends of skilled work in the Spheres of Activity (SoA) of industrial shoe production

WP 02 | A5

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1 Introduction

This comparative report about the findings of work package (WP) 2 is a joint product of the partners of the project “Innovative Skills for an Old Vocation” (ISOV). It is “setting the scene” for the following activities in the project. Our previous projects ICSAS and DIA-CVET demonstrated, that skilled work on European Qualification Framework (EQF)-levels 2-7 in industrial footwear production can be described by 18 Spheres of Activity (SoA).

Objective of WP 2 is to figure out, which of the (sub-)dimensions of the “mega-trends” digitalisation, sustainability and globalisation have impact on which of the SoA.

To reach this aim, in a first step a consensus about the (sub-)dimensions that could have impact has been developed; these activities are drafted in ***chapter 2***. A list of all 55 subdimensions including short descriptions can be consulted via the project webpage ISOV (2025).

Chapter 3 summarises, compares and analyses the results of the nine workshops (WS) in the participating countries Germany, Portugal and Romania. Although the relevance of the economic sector, the scope (mid-term or long-term) and the methods (qualitative/quantitative) of the WS are quite different, findings offer an indicative view on the expected influences of the sub-dimensions of the trends on future skilled work in the sector.

The brief final ***chapter 4*** offers an outlook on those SoA, that have been chosen for manual development, piloting and evaluation in WP4.

2 Potential (sub-)dimensions of sustainability, globalisation and digitalisation

In our previous projects ICSAS and DIA-CVET it was concluded that skilled work of colleagues qualified via Initial Vocational Education and Training (IVET) can be described by 9 Spheres of Activity (SoA, ICSAS 2020), and those of colleagues qualified via Continuous VET (CVET) or Higher Education (HE) by 13 SoA (DIA-CVET 2023). Some SoA like "quality assurance" appear in both lists, as colleagues from various educational levels are working in these SoA; thus, skilled work in the whole sector can be described by 18 SoA; building the x-axis of the aspired matrix to analyse and predict the influences of the sub-dimensions of the trends sustainability, globalisation and digitalisation on work processes.

Activities started with desk research to figure out the potential (sub-)dimensions for the y-axes (sustainability, globalisation and digitalisation) that might impact the 18 Spheres of Activity (SoA) of the sector. Authors like Pfeiffer et al. (2017, p.14), who pursued a comparable approach for the trend of digitalisation in metal industry, were examined. Additionally, findings of projects with similar aims (e. g. Metaskills4TCLF 2024), were taken into account.

Each country had the lead for one of the trends (Germany: digitalisation, Portugal: globalisation, Romania: sustainability) and proposed five respective six dimensions, that are subdivided into various sub-dimensions. These first suggestions were presented to the whole ISOV-team, jointly discussed and confirmed with minor updates. The dimensions are documented in Table 1, Table 2 and Table 3.

Green awareness
Energy and process efficiency
Resource efficiency & Sustainable materials
Sustainable design & Circular economy
Chemical safety
Social responsibility

Tab. 1: Dimensions of sustainability

Demography
Economic and Social Factors
Qualification / Training / Knowledge
Markets and Consumers
Compliance

Tab. 2: Dimensions of globalisation

New Era of Robots
Artificial Intelligence (AI)
Big Data
3D Printing
Combination of Digitalisation and Sciences
Virtual and Augmented Reality

Tab. 3: Dimensions of digitalisation

Due to the size of data, only one example for subdimensions is documented in this report (Table 4); to consult the others, please refer to WP2/A1 via the project webpage https://isov-project.eu/results/.

1. Dimensions of sustainability

Green awareness	Sustainability education & consumer empowerment	Providing training for employees and consumers about sustainable practices in footwear manufacturing and use. Sustainability education ensures stakeholders understand the environmental impacts of their actions, fostering eco-conscious behaviour. Ensuring that consumers have access to clear, accurate, and meaningful information about the environmental, social, and ethical aspects of footwear products. This subdimension aims to empower consumers to make informed purchasing decisions that align with their values and sustainability goals, namely sustainable consumption.
	Industry partnerships	Collaborating with NGOs and green organisations to promote sustainable practices. Partnerships amplify the industry's efforts to raise awareness and enhance sustainability standards.
	Eco-labelling for footwear & digital transparency	Clear and certified environmental labels for shoes. Certified eco-labels provide transparency, helping consumers easily identify sustainable options and discouraging deceptive greenwashing practices. Blockchain technology ensures traceability and transparency, providing consumers with verifiable information about product origins and sustainability. Apps showing product lifecycle impact. Interactive digital platforms provide detailed insights into a product's environmental footprint, enabling informed consumer choices. An example is Digital Product Passport (DPP), a digital identity card for products, components, and materials, which will store relevant information to support products' sustainability, promote their circularity and strengthen legal compliance.

Tab. 4: Sub-dimensions of "green awareness"

Partners are aware, that this approach of operationalising the trends with respect to potential influence on the SoA is not the "one and only"; but it is reliable and -with respect to structure- easy to handle. Not this easy to handle is the sheer amount of subdimensions; in the application phase for the project ISOV it was expected, that ~20 subdimensions (for all trends) will be found; in fact, it were 55 subdimensions (16 for sustainability, 21 for globalisation, 18 for digitalisation). Thus, it was decided to continue working with three matrices (instead of only one), where each x-axis consists of the 18 SoA, and the 3 y-axes y_1 (sustainability), y_2 (globalisation) and y_3 (digitalisation) consist of the dimensions respective sub-dimensions of the trends.

3 Results of the workshops (WS) on the influence of the sub-dimensions on the SoA

Participants of the overall nine WS (three in each country) were experts from the sector and/or one of the respective trends; in each WS participated seven to eleven experts, so ~80 colleagues were involved. Discussions have been very engaged, partly controversial, thus as a first finding (F1) it can be concluded:

F1: Even within a country, tendencies in the SoA are consensus – but there is no clear picture of future work.

Although it was the explicit aim of the WS, to work "only" on the y-axes (subdimensions of digitalisation, sustainability and globalisation), the x-axis (SoA) was under discussion, as well. Especially in the context of digitalisation (new media) and the consequences for advertising and selling, in all countries an additional SoA "marketing" was suggested.

F2: SoA "marketing" was added as the 19th SoA of skilled work in the sector. It was even chosen as one of the twelve SoA to be piloted within WP4.

The WS in the three countries applied different methodologies. In Romania, a quantitative approach was applied, aiming at a concrete size (on a scale from 0 to 10, one decimal) combined with a short description of expected impact. In Germany, a qualitative approach was followed: The experts were asked, to briefly describe the concrete changes of any subdimension on the SoA – only for those, where they expect relevant impacts. In Portugal, a mixed method was applied; besides the quantitative approach (cp. WP2/A3 via ISOV 2025), qualitative dossiers of the main impacts on all SoA were produced; the following Table 5, Table 6 and Table 7 document the main results:

Dimension	**Analysis of the incidence of the greatest impact in the 18 spheres of activity**
A new era of robots	Spheres of activity of the production processes (cutting, sewing, assembly, finishing) and in the management of the same processes.
Artificial Intelligence (AI)	Greater impact on this dimension compared to the other dimensions and on all spheres of activity.
Large volume of data	Product design and technical development spheres, materials and management spheres
3D printing	Less impact compared to other dimensions, but emphasis is placed on product design spheres and new materials.
Combination of digitalisation and science	Product design and technical development spheres, materials and management spheres
Virtual reality and augmented reality	Product creation and production spheres

Tab. 5: Greatest impact of digitalization in PT

Dimension	Analysis of the incidence of the greatest impact in the 18 spheres of activity
Demographic factors	Spheres of activity of the production processes (cutting, sewing, assembly, finishing) and in the management of the same processes. Concerns about sustainability.
Economic and social factors	Greater impact on this dimension compared to the other sub-dimensions and on all spheres of activity.
Changes in qualifications	Relevant, medium and high impact in the various spheres of the footwear sector.
Markets and consumers	Medium/high impact in all spheres of activity highlighting product design spheres, new materials, supply chain management, training management and technological and communication developments.
Regulation and legislation	Management spheres and social responsibility.

Tab. 6: Greatest impact of globalisation in PT

Dimension	Analysis of the incidence of the greatest impact in the 18 spheres of activity
Green consciousness	Increased impact on the spheres of activity of product design and development and process management – Supply, quality, environment, administration, training.
Energy and process efficiency	greater impact in the spheres of planning and production activities, training, environmental and administrative management. Increased internal impact on the structure and activity of the company, considering sustainable measures alongside technological developments.
Sustainable resource and material efficiency	High impact in all spheres of activity, signalling concerns of accessibility and application of new sustainable materials and resources.
Sustainable design and circular economy	Average impact on the various spheres of the footwear sector, highlighting high impact on product design and management spheres.
Chemical safety	High impact on management spheres and production processes.
Social responsibility	Medium impact, high in the areas of management, planning and training.

Tab. 7: Greatest impact of sustainability in PT

The heterogeneous structure of the results of the WS might be illustrated by the matrix field “SoA cutting” (x-axis)/“lightweight robots” (y-axis). In PT, a “high impact” was concluded, similar in RO here an “increase[d] accuracy and speed” was highlighted – whilst in DE “costs and speed are problematic” was stated. This leads to finding 3:

F3: Although the heterogeneous structure of the results of the WS does not legitimate a classical comparison, outcomes are very valuable for the future work in the project.

The quantitative data from PT and RO allowed to identify the SoA, where re- or upskilling could have the largest impact; Table 8 summarises the number of dimensions, where the experts await an influence >8 (on a scale from 0 to 10, RO) respective an "high impact" (alternatives: no/low/medium, PT) on each SoA:

SoA	RO	PT	∑
Cutting	2	8	10
Stitching	3	8	11
Lasting	1	9	10
Assembly	3	8	11
Finish	2	9	11
Design	10	14	24
Production Planning	6	8	14
Technical Development	4	14	18
Training Management	4	13	17
Maintenance Management	5	11	16
Quality Management	3	10	13
New Materials	5	13	18
Supply Chain Management	6	8	14
Social Responsibility Management	3	6	11
Sustainability Management	6	12	18
Environmental Management	4	9	13
STEM	6	10	16
Health and Safety at Work Management	5	7	12

Tab. 8: Number of relevant dimensions for each SoA

Table 8 shows a clear "winner": SoA "Design" was mentioned as being influenced by 24 (in both countries together) dimensions – the following SoA ("Technical Development", "New Materials" and "Sustainability Management") have been mentioned only 18 times. All four SoA here have been chosen for manual development, piloting and evaluation in WP4.

The 2nd clear finding is that the "only blue collar" SoA ("Cutting", "Stitching", "Lasting", "Assembly", "Finish") have been mentioned more rarely (only 10 or eleven times) than the others – this might seem astonishing, but it was often argued, that, for example, "waste reduction is already in place due to economic reasons" or that robots are good in handling solid materials like metals – but poor in working with soft materials like leather or elastics.

The qualitative impact for the other SoA lies some in between (between 11 and 17); there were no distinct other findings that qualified or disqualified any of them for WP4.

The qualitative data from RO and DE gives valuable insights which subdimensions should be treated into which direction during manual development in WP4. To summarise, findings are indicative, not representative, or even final and will be subject of ongoing changes (cp. for example discussions on supply chain law in the European Union (EU)).

4 Conclusions for further work in the project

Despite the heterogeneous picture of the results of the workshops (WS) as drafted in the chapter above, the decision, which manuals for Spheres of Activity (SoA) should be updated in WP 4 to include the impact of the subdimensions of the trends was rather straightforward. Besides the quantitative findings, additionally was taken into account:

- The economic relevance of the respective spheres for the European/national/local labour market.
- The expected demand of possible beneficiaries.
- The expertise and equipment of the participating training providers.
- Although the "blue collar" SoA were mentioned more rarely, partners decided to include two of them (Lasting, Assembly) in the manual development, piloting and evaluating process – to cover aspects of whole skilled work in the sector.
- Political considerations; especially the discussions on supply chain responsibilities led to enormous uncertainties among companies; a smooth training offer for the respective SoA might help to reduce those.
- The "new" SoA "Marketing" was also chosen due to estimated relevance; the best product will not be sold if referring to "old-school" marketing (advertisements in newspapers, …), only.

Partners decided jointly to develop the following manuals for piloting in WP4; the last line indicates the country that has the lead in the development:

Science, Technology, Engineering and Mathematics (STEM)	Lasting	Design
Quality management	Assembly	New materials
Training management	Sustainability management	Technical development
Production planning	Supply chain management	Marketing
Germany	**Portugal**	**Romania**

Tab. 9: Spheres of Activity (SoA) chosen for preparation for piloting

5 References

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