Introduction to the companies features and occupational profiles within the furniture sector
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LEAD PARTNER:

ASSOCIATED ORGANIZATIONS:

European Federation of Building and Woodworkers

European Furniture Manufacturers Federation

European Furniture Manufacturers Federation

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INTRODUCTION TO THE COMPANIES FEATURES and OCCUPATIONAL PROFILES within the FURNITURE SECTOR

The DIGIT-FUR project

The **DIGIT-FUR** project http://www.digit-fur.eu (Impacts of the digital transformation in the wood furniture industry) will focus on the changes caused by the **Industrial Digitization** on the **European wood furniture sector in 2025**. It is a two years project (2017-2019) funded by EU trough the call Support for Social Dialogue. The project main deliveries will provide a better understanding of the possible **scenario of the sector due to digitization in 2025** and the effect of this process on sector **jobs** in terms of changes in occupations, **health and safety risks** at work and new **skills** needed and thus support the social dialogue during next years.

The **partners** of the DIGIT-FUR project are: **CENFIM** - Furnishings Cluster and Innovation Hub (Lead Partner); **EFBWW** - European Federation of Building and Woodworkers; **UEA** - European Furniture Manufacturers Federation and **EFIC** - European Furniture Industries Confederation.

This project step

This phase of the DIGIT-FUR project aims to investigate and understand which changes the Industry 4.0 will provoke on some professional occupations (specific and not) of the Furniture Sector (NACE 31: 31.01, 31.02, 31.09). This research is built on project previous outcomes such as the Report on Furniture Sector Status and the Definition of the sector future scenario in 2025. The changes will be analysed in relation to:

- Occupations' tasks
- Industry 4.0 technologies involved
- Changes timeline
- Level of regional development and company features and capabilities
- Occupations volume
- OHS risks
- Skills and competences

Employment in furniture sector in Europe

In 2014, the employment rate of the population aged 15 to 64 in the EU-28, as evidenced by the EU workforce survey, was 64.9%. In 2008 it reached its maximum value (65.7%), then dropped in the following years to 64.1% in 2010. During the last years, we saw a continuous increase in the number of employed people in EU: 66,02% in 2015, 66,94% in 2016, 68,06% in 2017. The latest available data, 2018-Q1 shows a value of 67,8%. Manufacturing occupy for 15% of employees in the European Union, reaching the highest levels in countries such as the Czech Republic (25%), Slovenia (21%) and Germany (19%).

As far as furniture sector is concerned (NACE 31), we can say that total employment in Europe (EU 28) is almost one million (955,521) in 2014, thus covering about 3% of European manufacturing workers. The top 5 countries by number of employees in the Furniture sector are: Poland, Germany, Italy, United Kingdom and Romania.

Table 3.1.- Manufacture of furniture, Number of persons employed (Source: EUROSTAT)

FURNITURE	Persons employed in 2014	% Persons employed furniture / Persons employed in manufacturing
European Union (28 countries)	955,521	3%

Furniture companies in EU

The EU28 furniture sector (NACE 31) is predominantly made of SMEs, with around 88% being micro enterprises (fewer than 10 employees) and another 10% of companies being small (10 to 49 persons employed). Medium-sized companies (from 50 to 249 persons employed) account for 2%. These companies altogether account for over 75% of total sector production (CSIL, 2010). However, while large companies (more than 250 persons employed) may account for less than 0.5% of total enterprises they generate the 25% of the total value of furniture produced in EU28 (CSIL, 2010). The constant closure of companies that happened during the last years looks to slow down.

Table 1 - Number of furniture enterprises by size in EU28 (Source: EUROSTAT)

	YEAR / number of enterprises in EU28			
Enterprise size:	**2011**	**2012**	**2013**	**2014**
from 0 to 9 persons employed	110,000	108,157	104,606	104,885
from 10 to 19 persons employed	8,589	7,933	7,900	7,675
from 20 to 49 persons employed	4,839	4,680	4,478	4,282
from 50 to 249 persons employed	2,756	2,590	2,510	2,412
250 persons employed or more	425	420	410	404
TOTAL:	**126,000**	**123,774**	**119,921**	**119,656**

In the study, we will also strive to understand how the dimension of companies limit or facilitate their capacities to adopt Industry 4.0 new technologies and innovative production processes.

Classical organization structure of Furniture companies

As shown before, the great majority of furniture companies in EU are small ones. This situation affects quite a lot the organizational structure of companies. According to the findings of the FUNES project[1] "*Companies regular departments depends on the size (of the companies); for the majority of SMEs a single person covers several roles for different areas*." Project results confirm that companies' regular departments are the following:
Management, Marketing, Technical office, Production section, Packaging and Transport.
"Their presence, dimension and relevance depend on the company size, biggest ones do have all departments, but in small companies different roles coincide in one person." We find the technical office only in medium or big companies.

According to the TNO, ZSI, SEOR[2] (2009) study the main job function categories within the sector and their relevance are presented in the following table 2, which shows that three categories - Skilled handicraft workers (Cabinet Makers and Upholsterers), Machine operators, Labourers - represent more than 60% of the total workforce.
The table below provides an overview of the sector jobs functions and link them with the occupational profiles targeted by DIGIT-FUR. These occupational profiles could be not the only ones related to each of the identified job functions, meaning they could cover just part of the volume suggested in the table for each of the job functions.

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[1] FUNES – Furniture New European Skills 2020 http://www.funesproject.eu

[2] TNO, ZSI, SEOR, Investing in the Future of Jobs and Skills - Scenarios, implications and options in anticipation of future skills and knowledge needs, Furniture (2009), EC.

Table 2 – Jobs functions, volumes and link with Professional profiles targeted by DIGIT-FUR (Own calculation based on TNO, ZSI, SEOR (2009) study)

Job function categories	Approx. percentage of Workforce (total workforce in 2014: 955,521)	Approx. volume in 2014 (955.521)	Professional profiles targeted by DIGIT-FUR (ESCO occupational profiles)
Managers	7% (with a decreasing for high-educated managers and an increase in low-educated managers)	66.886	No covered by this study
ICT Professional	1%	9.555	No covered by this study
Designers	Small share (they are mainly outsourced), estimation less than 1%	< 9.000	2163s Furniture Designer
Production manager	2%	19.110	1321s Industrial production manager
Sales and marketing staff	2%	19.110	1221 Sales and marketing managers + additional profiles not covered by this study
Supply chain managers	Small share, estimation less than 1%	< 9.000	1324s Supply Chain manager
Administrative support staff	10%	95.552	No covered by this study
Plant and machinery maintenance and repair workers	6%	57.331	2141s Maintenance & repair engineer + additional profiles not covered by this study
Skilled handicraft workers (Cabinet Makers and Upholsterers)	> 50%	477.761	7522 Cabinet-makers and related workers 7534 Upholsterers and related workers 8219s Furniture assembler
Machine operators	4%	38.221	7523 Woodworking-machine tool setters and operators 8172 Wood processing plant operators
Labourers	7%	66.886	9329 Manufacturing labourers not elsewhere classified

Currently, there is a clear lack of availability (or accessibility) of detailed data about the volume of the different ESCO (European Skills/Competences, qualifications and Occupations) occupational profiles for the sector. A request of these data has been submitted by CENFIM to EUROSTAT officers. Usually, the time to obtain the data requested is longer that one year. For this reason, we have used all data we could find on the market, but it will be impossible to update and correct them before the end of the project using the most updated and detailed ones, that hopefully will be provided by EUROSTAT.

Probability of automation of the targeted profiles

Another aspect that we considered relevant to identify the impact of the digitization on the occupations was the probability of automation of all the occupational profiles targeted.
These data provide a very good idea of the level of impact of the Industry 4.0 on each occupational profile. These percentages aim to measure which is the probability that these profiles will be affected by sector automation and so the level of changes of the tasks that will affect them in 2025. The identification of these data was done thanks to the study Hernández[3] (2018) and using the correspondence tables IDESCAT (2013) and CN02011 with ISCO-08[4]. The Hernández (2018) study used data coming from the Frey and Osborne (2017) research. It is important to properly understand also the concept of "probability of automation" used by them in the study. Frey and Osborne assign the probability of automation to each occupational profile,

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[3] J.M. Hernández, J. Fontrodona, A. Morron, L. Castany, M. Clavijo, B. Tascón - L'impacte laboral de la Indústria 4.0 a Catalunya (2018),.

[4] INE: CNO2011-CIUO08 Correspondence http://www.ine.es/daco/daco42/clasificaciones/corr_cno11_ciuo08.xls

but what the technology really automates are the different tasks that compose each occupation. These tasks can be affected at different level by the new technologies. Therefore, it is reasonable to expect that many of the professions with a high probability of automation will in fact not be completely replaced by a machine, but that robots/cobots/computers will absorb some of their tasks and the professions will be reformulated and they will include a different set of tasks.

Anyway it is important to understand that the key difference of this fourth industrial revolution is that the new technologies facilitates the automation of tasks that are not repetitive or allow implementing activities/tasks that before were not possible (i.e. analysis of big data). There will be only three groups of tasks that the technology will still not be able to perform in the next decades: perception and manipulation in disordered environments, creative intelligence and social intelligence.

Another relevant aspect to be kept in mind is that this approach does not take into consideration all the aspects related to the implementation of the new technologies. For example, the implementation is not immediate and they require different levels of investments, they need to be feasible within company production chain, and social or legal barriers could prevent or hinder the implementation of these technologies.

Table 3 – Automation probability of Targeted Occupational Profiles, based on Hernández (2018).

ISCO Targeted by project	ISCO Definition Targeted by project	Automation probability
1221	Sales and marketing managers	1,35%
1321s	Industrial production manager	3,00%
1324s	Supply Chain manager (Supply, distribution and related managers)	59,00%
2141s	Maintenance & repair engineer (machinery maintenance and repair workers)	2,90%
2163s	Furniture designers (Product and garment designers)	2,90%
7522	Cabinet-makers and related workers	91,50%
7523	Woodworking-machine tool setters and operators	97,00%
7534	Upholsterers and related workers	39,00%
8172	Wood processing plant operators	86,00%
8219s	Furniture assembler	97,00%
9329	Manufacturing labourers not elsewhere classified	74,80%

Workers volume changes for the targeted occupational profiles due to Digitization in 2025

The following tables present an approximate forecasting of the changes in workers volume due to digitization in 2025. This will clearly show which are the expected trends for each of the furniture jobs functions and sector targeted occupational profiles.

We based our analysis on the Vogler (2016) study that focus the attention on the changes in occupations volumes due to social, market and economic aspects and evolutions in Germany and on the industries digitization impact also in the German scenario. It analyses the evolution in different years and different scenarios with and without the effect of digitization. Based on this, it is forecasted that the **impact of the digitization could reduce the jobs volume in 2025 within the furniture sector up to a 7,29 %** compared to the situation in 2014. Anyway, we have to take into consideration that this Vogler study refers to a specific country (Germany) of the EU

and it is quite difficult to forecast with precision that different EU countries are equally affected by the sector digitization.

Different outcomes show that in 2025 the furniture sector occupation volume could suffer a decrease of up to a 19,5 %. Just to make an approximation of the number of jobs lost according to these forecasts, the number of occupation of the furniture sector in EU in 2025 could be around 770.000. Another additional approximation is that, **due to the digitization**, the sector could suffer an **extra decrease of around 70.000 jobs**.

A positive outcome of this Vogler (2016) forecasting study is that in 2030 the sector could recover and increase the number of jobs in comparison to 2025 up to 8,7% (61.000 jobs) due to the effect of digitization, however being the total aggregated lost around 20,36% (- 194.500 jobs) compared to the 2014 scenario.

Based on different studies, the table 4 presents and relates: the main job functions categories of the furniture sector in EU identified in TNO (2009) study; the link of the DIGIT-FUR target profiles with these job functions; the approximated number of workers for each of these functions (based on TNO (2009) study); the related probability of automation of the different occupations (based on Hernández (2018) study) and finally the "Expected change in workers volume in 2025 due to sector digitization" was calculated using the Vogler (2016) analysis of the digitization impact for the different targeted occupational profiles.

In summary:

- Digitization, within the furniture sector, will diversely affect the volume of the different occupational profiles, some of them will face a slight volume increase (Sales and marketing managers, Industrial production manager, Maintenance & repair engineer, Furniture designers, Furniture assembler), while some others will face a slight volume decrease (Supply Chain manager, Cabinet-makers and related workers, Woodworking-machine tool setters and operators, Upholsterers and related workers, Wood processing plant operators, Manufacturing labourers)

- It looks that until 2025, digitization will cause a reduction of jobs in the furniture sector (around 7,3%, meaning 70.000 jobs). But it looks that between 2025 and 2030, digitization will create new jobs in the sector (8,7%, 61.000). So the overall effect of digitization on the furniture sector volume of jobs, between 2014 and 2030, will be a loss of around 9.000 jobs.

- Anyway, we have to consider as well that these studies foresee that other factors, such as socials, economic and markets changes, will negatively impact the sector volume of jobs. They should destroy around 20% of jobs by 2025.

Table 4– Workers volume changes expected for 2025 (Own calculation based on different studies)

Job function categories	Professional profiles targeted by DIGIT-FUR (ESCO occupational profiles)	Approx. volume in 2014 (955.521)	% of automation probability	Expected change in workers volume in 2025 due to sector digitization
Managers	No covered by this study	66.886	-	-
ICT Professional	No covered by this study	9.555	-	-
Designers	2163s Furniture Designer	9.000	2,90%	**+ 1,08%**
Production manager	1321s Industrial production manager	19.110	3%	**+ 4,3%**
Sales and marketing staff	1221 Sales and marketing managers + additional profiles not covered by this study	19.110	1,35%	**+ 3,8%**
Supply chain managers	1324s Supply Chain manager	9.000	59%	**- 1%**
Administrative support staff	No covered by this study	95.552	-	-
Plant and machinery maintenance and repair workers	2141s Maintenance & repair engineer + additional profiles not covered by this study	57.331	2,9%	**+ 3,16%**
Skilled handicraft workers (Cabinet Makers and Upholsterers)	7522 Cabinet-makers and related workers 7534 Upholsterers and related workers 8219s Furniture assembler	477.761	91,5% 15,9% 97%	**- 0,86%** **- 3,23%** **+ 2,66%**
Machine operators	7523 Woodworking-machine tool setters and operators 8172 Wood processing plant operators	38.221	97% 86%	**- 0,86%** **- 0,86%**
Labourers	9329 Manufacturing labourers not elsewhere classified	66.886	74,80%	**- 0,86%**

In the following Table 5, we include the percentage of the expected changes in workers volume in 2025 only due to sector digitization. It is important to highlight that the changes identified are related just to the impact of digitization on the jobs and they do not take into consideration the economic, market and social aspects and trends that will surely affect the jobs volume changes. These other aspects have been also studied separately in Vogler (2016).

Table 5– Workers volume changes expected for 2025 due to the sector digitization

ISCO Targeted by project	ISCO Definition Targeted by project	Workers volume change in 2025
1221	Sales and marketing managers	+ 3,80%
1321s	Industrial production manager	+ 4,30%
1324s	Supply Chain manager (Supply, distribution and related managers)	- 1%
2141s	Maintenance & repair engineer (machinery maintenance and repair workers)	+ 3,16%
2163s	Furniture designers (Product and garment designers)	+ 1,08%
7522	Cabinet-makers and related workers	- 0,86%
7523	Woodworking-machine tool setters and operators	- 0,86%
7534	Upholsterers and related workers	- 3,23%
8172	Wood processing plant operators	- 0,86%
8219s	Furniture assembler	+ 2,66%
9329	Manufacturing labourers not elsewhere classified	- 0,86%

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