D1.2 REPORT ON STAFF LEARNING MOBILITIES

FTalliance

FTalliance

D1.2 MOBILITIES REPORT

FULL PARTNERS

POLITECNICO MILANO 1863

TUDelft

DECATHLON

PAULINE VAN DONGEN

ASSOCIATE PARTNERS

PVH

ESTIA

ual: london college of fashion

grado zero innovation

PESPOW

THE SWEDISH SCHOOL OF TEXTILES

STENTLE

WY

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| Abstract: | T1.2 further explores and builds relationships and mutual understanding between HEIs and companies, to ensure the talent pool graduating from universities across Europe is equipped with the relevant high-level skills and profiles to respond to the current and emerging needs within the area of Fashion-Tech.

Due to the Covid-19 pandemic, it was decided to modify the original mobilities, where the consortium partners would physically visit labs, HR and teams, to become instead 3 interactive virtual study visits. Moreover, to ask all consortium partners to produce a digital portfolio (including virtual tours, showing labs and facilities) to highlight what they do specifically and thus enable a wealth of company insights to be shared on the current and future Fashion-Tech trends; associated job roles and company structures. |
|---|---|
| Keyword List: | Innovation, Fashion-Tech, Future Job Roles, company structures, smart textiles, sustainability through innovation and digitalisation, biomaterials, wearable tech, 3D design, prototyping, new skills, interdisciplinarity, platform. |

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EXECUTIVE SUMMARY

The aim of T1.2 was to further explore and build relationships and mutual understanding between HEIs and companies. The intention to ensure the talent pool graduating from universities across Europe is equipped with the relevant high-level skills and profiles to respond to the current and emerging needs within the area of Fashion-Tech. In the original plan, 36 staff mobility visits were foreseen for academics and careers staff to visit company and university labs. The trips would involve **company/lab tours, discussions, and workshops** to gain vital first-hand information from staff working in **Fashion-Tech roles.** Furthermore, to visit and consult with **HR teams to establish the person profiles**. It covers a further iteration on the current Fashion-Tech roles scene explained in the Summary in D1.1 focusing and **indicating trends (e.g., regional, by company size**) and highlighting where there are anticipated **future developments** that are emerging and should be responded to.

Due to the pandemic, it was decided to modify the original plan for face-to-face visits to 3 interactive study visits hosted online by 1) PVH; 2) Decathlon and 3) Pespow. Furthermore, all consortium partners were asked to complete a digital portfolio for their company/HEI (including virtual tours – a showcasing of labs, facilities, products etc.,) with support from the other consortium members. The questions and outcomes of a survey (chapter 2) developed by UAL based on previous desk research were used as a guideline to structure the content of both the portfolios and the interactive study visits. Key findings from the questionnaire/survey are detailed in the 12 points below:

1) **Sustainability through innovation and technology** was overwhelmingly the priority for all consortium partners, which underpins the direction for all areas of the businesses.

2) Companies of all sizes view **smart textiles and biomaterials** as **areas of growth**. These include shape-changing materials, sensors, biometric and functional simulations for fashion, and wearable technology.

3) A **digital ecosystem** that uses data to provide best practice and tools becomes important, with more automated and intelligent management of resources and projects.

4) All sized companies are focusing on **wearable tech and 3D design**

5) As companies grow in size, the focus increases towards scalable supply chain digitisation and digital manufacturing which are linked to sustainability goals and data.

6) HR departments tend not to exist in micro and small companies but are introduced for medium sized companies as they grow in size.

7) A **digital approach** and use of tools were noted as mandatory and essential to all companies, with employees having the **skill set to implement change** whilst being agile and open to new ways of working.

8) Fashion-Tech skills are seen as constantly emerging and growing, therefore training employees with **new skills** is recognised as part of an ongoing transformation.

9) **Prototyping** is a key approach for all sized companies, with all or a wide range of roles involved in experimentation and mocking-up new ideas. '*All our activities involve this approach; this is the way we always work*'.

10) **Micro and small** companies tend to have a more **'agile approach'** with **multiple and overlapping roles** taking place in an interdisciplinary studio/lab environment.

11) Larger companies, with many more departments, have 'SME types' of departments – each exploring a specific Fashion-Tech focus/product embodied by expertise.

12) Finally, and with regards to points 10 and 11 above, the way in which micro and small companies work and are structured parallels the entrepreneurial approach found in incubators and start-ups which exist as separate entities within large companies.

The insights from the questionnaire supported the 3 interactive study visits (chapter 3) and the 12 Partner Portfolios (chapter 4), which aimed to animate and make visual findings from this questionnaire.

During the 3 interactive study visits hosted by Decathlon, PVH and Pespow respectively, the 3 consortium partners gave useful insights on how their companies are integrating the disruptive digitalisation of the fashion system within their companies. They highlighted and confirmed the evolution of current Fashion-Tech roles and the eagerness to prioritise sustainability through innovation and integrated technology. Moreover, the need for an interdisciplinary approach to open up the siloed departments to enhance knowledge sharing and facilitate collaboration from a multiplicity of perspectives was clearly stated. All 3 companies also underlined that Fashion-Tech will grow across a range of roles and areas and be a point for leadership for the business.

Essential for success is the position of an ***Innovation Manager*** within the company structure, someone who oversees all competences, whilst building meaningful connections amongst staff. This person possesses and understanding of how to get staff on board and an ability to change mind-sets. In addition, the role of a ***Translator***, a business innovation manager, is key. This is someone who can build the bridge between all competences and put that into a new business model or revenue stream, as in a product; a service; turning a smart idea into a scalable business. To enable start-ups to be successful within a company an innovation manager is required to have a deep understanding of the business process to be able to endorse the change not knowing where it will land.

One of the biggest future challenges to address is the multifarious nature of **sustainable policies** with their varied requirements and certifications. Specific expertise in this area is therefore needed to understand and translate these different policies in a unified approach that meets diversity of clients and policy-makers' expectations.

Since Fashion-Tech skills are seen as constantly emerging and growing, **upskilling and training employees with new skills is recognised as part of an ongoing digital transformation.** Future, collaborations between companies and universities will become increasingly important to ensure staff and students' knowledge around sustainability and the latest digital developments remains up-to-date in a landscape where many fundamental changes are foreseen. Lifelong learning and training via *short courses* delivered by universities or internal company training will be key. Universities and companies need to work together to optimize the education of young talent, the recruitment processes and offering the right training for current staff.

It is recognised that the digital transformation is a disruptive process and faces many **challenges**. Yet, companies need to focus on the human factor and avoid implementing technology just for the sake of it. Instead, when implementing Fashion-tech, it is important to build meaningful connections to engage staff, especially 'conventionally trained' designers who often need first to be convinced of the opportunities and benefits using digital tools can bring when designing. For example, a mix and match of traditional expertise with new technologies and cross-disciplinary know how will enable the creation of new fabrics, treatment and techniques. The digital transition is work in progress – best practices; new revenue models; the time savings, and new roles all need to be understood and new habits and required practices adopted.

Finally, to be able to successfully implement digital transformation across the whole supply chain **collaborations across a wider range** of disciplines and manufacturers is required e.g., to develop

new machinery for automated production processes. Joint research with universities and companies in

R&D is another important strand for future innovations especially around smart textiles, and biodegradable materials. Internship programs and company residencies for students and graduates can be used for co-creating and co-exploring new directions. This will be explored in more detail in FTalliance WP3 through FTalliance Fashion-Tech residency projects.

These conclusions and recommendations will inform the deliverables for D1.3: the Fashion-Tech portfolio consisting of 8 future job profiles; Human Resource guidelines and future recruitment tools, and 4 Industry podcasts relating to the assessment and recruitment of future Fashion-Tech talent.

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LIST OF ABBREVIATIONS

WP	Work Package
E4FT	Edu4FashionTech
ESTIA	École Supérieure des Technologies Industrielles Avancées
FG	Focus Group
FTall	FTalliance
R&D	Research & Development
HB	Högskolan i Borås, University of Borås
HEI	Higher Education Institution
INDUSTRY 4.0	The fourth Industrial Revolution
FE	Front-End
OECD	Organisation for Economic Co-operation and Development
PESPOW	Pespow Creative Garment Engineering
POLIMI	Politecnico Di Milano
UAL	University of the Arts London
HR	Human Resources
rPET	Recycled polyethylene terephthalate
SME	Small/Medium Size Enterprise
WLY	We Love You Communication
B2B	Business -to-Business
B2C	Business-to-Consumer

1. STAFF LEARNING MOBILITY: STUDY VISITS TO COMPANIES WP1 - T1.2 (M3-18)

1.1 INTRODUCTION

The aim of T1.2 was to further explore and build relationships and mutual understanding between HEIs and companies. The intention to ensure the talent pool graduating from universities across Europe is equipped with the relevant high-level skills and profiles to respond to the current and emerging needs within the area of Fashion-Tech. In the original plan, 36 staff mobility visits were foreseen for academics and careers staff to visit company and university labs. The trips were to involve **company/lab tours, discussions, and workshops** to gain first-hand information from staff working in Fashion-Tech roles and HR teams to establish the person/job profiles.

This mobility plan was considered vital for the exchange of knowledge between HEIs and company staff to provide the necessary insights and understanding required for the design of the future professional roles needed in Fashion-Tech industry.

Due to the Covid-19 pandemic, the study visits planned for Spring 2020 had to be postponed and were re-located to Spring 2021. However, in December 2020, when it became clear that the pandemic was ongoing, the original plan was modified further to one that consisted of 3 interactive virtual study visits. In addition, all consortium partners were asked to complete a digital portfolio (including virtual tours showcasing their labs and facilities) with the support of other consortium members. The questions and outcomes of the questionnaire (developed by UAL [based on desk research]) were used as a guideline for the structure and content of the digital company portfolios.

2. COMPANY STRUCTURE AND FASHION-TECH ROLES WITHIN THE ORGANISATION

2.1 INTRODUCTION

T1.2 covers a further iteration on the current Fashion-Tech roles' scene explained in D1.1 focusing on **related trends (e.g., regional, by company size**) and highlighting where there are anticipated **future developments** emerging that should be responded to. A summary of the research findings on the 'Future Job Roles in Fashion-Tech is available in pdf form here: https://fashiontechalliance.eu/images/PDF/Summary_of_Findings_FGResearch_WP11_Dec_2020_compressed.pdf

As explained above, the original plan was to capture these results via 12 mobility visits to companies and HEIs but consortium plans shifted due to the Covid-19 pandemic and restrictions to conduct 3 online interactive study visits instead. These were hosted by the companies PVH, Decathlon and Pespow and are described further below. The format for these 3 study visits was explored with all partners. The outcomes of WP1 - T1.1 and outcomes of the desk research were used as input, and interactive Miro boards were employed in a workshop to outline the most important themes to discuss in the interactive study visits. (See chapter 3).

In addition, it was decided the 12 partner portfolios to be completed by each partner should

include highly visual materials and attractive footage of labs and company spaces in addition to text highlighting the most relevant information about a company's Fashion-Tech approach, structures and values. Companies were encouraged to use the questionnaire as a framework for their portfolio. In the following chapters more information around the process and outcomes are outlined. (See chapter 4).

2.2 METHODOLOGY AND RATIONALE DESK RESEARCH

WP1 - T1.2 started in April 2020 with desk research, accessing the consortium partners' websites. The objective of the desk research was to review and gain initial insight and understanding of the industry consortium partners' Fashion-Tech landscape through analysing a collection of secondary data. The purpose of researching online was 1) to unpack emerging trends and themes; 2) draw a comparison between Micro/SME and big companies, and 3) to understand what further information is needed from companies.

The next step was to further explore the missing information in the **questionnaires** that could feed into mobility visits in WP1 -T1.2 (e.g.,12 partner portfolios and the 3 online study visits).

<ins>Desk Research Methodology</ins>

A quantitative methodology was used to collect data from company websites.

<ins>Method</ins>

A quantitative comparison table was created using Microsoft Excel to map, categorise, analyse, and review information found on websites.

<ins>Quantitative Comparison Table Process</ins>

A spreadsheet was devised with headings (listed below) to collate and outline the current company infrastructure and Fashion-Tech roles scene, direction, and priorities.

The spreadsheet enabled a comparison between Micro/SME and large companies, indicating the similarities and differences, and emerging trends.

Comparison table headings:

- Company
- Description
- Website
- Company/ Regional/ Size (SME – Large)/ Employees
- Infrastructure
- Departments/ Teams
- R&D/ Labs/ Hubs
- Key Priorities/ Areas of Interest
- Fashion-Tech Projects
- Future Developments/ Ambitions
- Keywords
- Insights/ Narratives/ Trends

2.3 DESK RESEARCH FINDINGS

This chapter presents the analysis and findings from the desk research organised into company structure; team; job roles and skills of industry consortium partners, and through a comparison between Micro / SME and large companies.

<u>Companies</u> can be classified in distinct categories according to their size, OECD (2020):

- Micro – 0-9 employees
- SME (Small Medium Enterprise) – 10-49 employees
- Medium – 50-249 employees
- Large – 250 plus employees

<u>Analysis Summary</u>

Themes have been categorised based on findings from the data collected. Short definitions have been created to summarise insights that emerged from the desk research.

Micro/SME/Medium companies tend to have a more experimental and prototyping approach, with multiple and overlapping roles taking place in a studio/lab environment. They are known for specific areas of expertise/ service/ knowledge/ approach in Fashion-Tech.

Larger companies tend to invest in incubator and training programmes to drive innovation in learning and technology capabilities and work towards a game-changing vision. Technology is embedded into infrastructure and process to create fashion products and services.

Both large and small companies are exploring similar themes in Fashion-Tech, with sustainability being priority for all.

<u>Digital Strategies in Micro/SME/Medium Companies</u>

Embodied – Digital skills tend to exist within individuals, such as founders, senior designers, and specialists, who drive the direction of the company. Values also play a big part in informing the vision for the company.

Experimental – Driven by creative materials experimentation and conceptual narratives that explore new forms of expressions and tactile experiences. An artisanal approach to innovation involving research, rapid prototyping and bringing together innovative technologies and traditional techniques to nuanced digital craftsmanship.

Disruptive – Fashion-Tech designer pushes the boundaries and explores in a dynamic and changing space. Works at the intersection of fashion, technology, and science.

Agile approach – Companies/designers have multiple and overlapping roles and interdisciplinary teams.

Studio and lab environment – A space for experimenting, research, making, rapid prototyping and testing. A space that enables cross-disciplinary experimentation between fashion, technology, and science.

Lab set-up – Traditional roles such as researcher, research assistant, technical support etc.

Collaboration – Cross-disciplinary collaborations and with specialist research for applied technical innovation.

Consultancy – Smaller companies offer consultancy to external parties as part of their business model.

Fashion-Tech definition – Established as a Fashion-Tech or materials innovation company known for specific areas of expertise/ service/ knowledge/ approach.

Digital Strategies in Large Companies

Investment – Invest in research and incubator programmes to drive innovation and leadership.

Research labs – Work with both internal and global external research labs for innovative product development and testing.

Training programmes – Offer staff training, seminars, and development for employees in new learning and technology capabilities. Specific programmes such as 3D digital design for all design teams including designers, patternmakers, fit technicians, product developers and merchandisers.

Long term strategy and game-changing goals – Such as aims to achieve 100% 3D apparel design by 2022 collections, and 100% renewable electricity by 2026 for stores and warehouses.

Fashion-Tech placement – Harder to define what are the 'Fashion-Tech' roles and which department(s) are they placed. (Design, engineering, industrial and material innovation, research, prototyping etc)

Fashion-Tech definition – Fashion-Tech company versus a fashion company that integrates technology. A Fashion company known for creating fashion garments, and technology is embedded into infrastructure, process and product and systems development.

Emerging Trends from all Companies

Growing digital themes – Service platforms, toolkits, digital spaces, direct-to-consumer, e-commerce retailer, design for digital experiences.

Sustainability priorities – Circularity, sustainable practice goals, renewable energy, and recycling.

Anticipated future developments – Growth in 3D design training, and digital product design linked to sustainability goals and data (such as zero-waste design, circularity models, transparent and smart production, and manufacturing). Move towards compelling online consumer experience linking 3D design to digital showrooms and avatars.

Visualisation: word cloud of emerging themes

Keywords were highlighted from the collated desk research to indicate emerging themes, priorities of the industry consortium partners and the emergent landscape in Fashion-Tech. Words that were mentioned the most, and were thus significant, appear the largest size in the diagram i.e. 'Sustainability', 'Wearable', 'Data', and 'Waste' (see Fig. 1 [below]).

Figure 1. Word Cloud featuring key words from collated desk research.

2.4 INDUSTRY CONSORTIUM RESEARCH QUESTIONNAIRE

2.4.1 INTRODUCTION

Following the desk research outcomes, a questionnaire for FTalliance industry partners was developed by UAL in the Autumn of 2020 to gather further insights to provide a clear landscape for careers in Fashion-Tech.

The research questionnaire enabled the collection of data from the eight FTalliance industry partners for the mapping of actors, activities and capabilities within each of their organisational structures. It also highlighted how roles are connected to particular activities and to the skills of the actors carrying out those activities within the companies.

Covid-19 Modifications

Due to health considerations and travel restrictions, HEIs were not able to travel to the industry partners based across Europe to carry out the WP1 T1.2 Mobility Study Visits. FTalliance industry and HEI partners have worked together to problem-solve Covid-19 limitations and produce creative digital alternatives for WP1 deliverables for the project. All previous WP1 activities and deliverables were modified and adapted to take place online. The plan to conduct the Staff Mobilities as online Interactive Study Visits built on the successful remote working already carried out for the WP1 T1.1 Focus Group research.

Aims

The primary aim of the questionnaire was to gather further insights from all FTalliance industry partners on their respective companies to generate a clear landscape for careers in Fashion-Tech whilst also allowing for comparison of Fashion-Tech between micro, SME and large companies. The secondary aim for the questionnaire was to help guide each FTalliance industry partner to unpack what information they should include from their company in their digital Fashion-Tech portfolio.

Methods

The questionnaire utilised both **qualitative and quantitative methods** of questioning to gather data from consortium partners. It was co-designed with Enrico Cozzoni, FTalliance Consortium partner from Grado Zero Innovation.

The design of the questionnaire integrated an **exploratory approach and ontological approach**. The specific value and purpose of each method is explained below:

• The exploratory approach mapped how roles were connected to activities, and how company structures were linked to teams and departments, job roles and skills (activities and capabilities).

• The ontological approach gathered knowledge-based data on the Fashion-Tech domain through its roles, skills, trends, and definitions across small and large companies. This provided an understanding of relationships and interconnections that emerged between concepts and themes.

The questionnaire was based on the findings from T1.1, and the themes detailed in T1.2 that would have been uncovered in the learning mobility study visits (see further below). As previously mentioned, the mobility study visits were modified due to travel restrictions. Therefore, the questionnaire captured relevant information needed to be obtained as part of WP1 T1.2 digital mobility insights and visualisation through the 12 partner portfolios.

In WP1 T1.2: staff from the HEIs carried out workshops with the companies for example, to establish the types of **Fashion-Tech roles in their organisation, mapping the teams and departments where the roles are based across the organisation.** The findings have been collated into a report detailing the current Fashion-Tech roles scene (see: (D1.3 'Fashion-Tech Job Profiles Portfolio') which indicates any particular trends (e.g., regional, by company size) and highlights where there are anticipated future developments that are emerging and should be responded to in terms of strategic planning and skills development.

The impacts of Covid-19 to the fashion sector (sensitivities to individual industry partners) were acknowledged by both industry and HEI when designing the questionnaire. Impacts, as stated by Cozzoni (below), that would be far reaching and bring about change in industry and education alike:

> *COVID-19 will completely re-shape and refocus the Fashion Industry and as a consequence the Fashion-Tech market, curricula and employability profiles*
> (Enrico Cozzoni 2020: email)

Participants were invited to answer a 30-minute online questionnaire about the company they work in. The questions focused solely on Fashion-Tech in relation to company vision and

structure, including teams, departments, job activities, roles, and skills. No personal questions were asked and answers remained anonymous.

Below we present the analysis and findings from the questionnaire research into company structures – teams, job roles and skills of the industry consortium partners, through a comparison between Micro/SME and large companies. The research findings build on and link to the prior completed desk research undertaken by UAL. Some answers are included in the form of quotations taken from the respondents' answers, but these remain anonymous and are all cited the same as 'anonymous: 2021' rather than differentiated by company. They do however indicate the size of the company micro/small, medium or large where this is pertinent to mention.

The consortium is made up of 8 European industry partners representing Fashion-Tech across micro, small, medium, and large companies (OECD [2020]: classification on company sizes provided above, see p.13 of this report). They were asked to fill out the questionnaire as follows: 1-3 employees for an SME, or 3-5 employees for a large company, across (for example) Design, Business, HR, R&D, Marketing etc., to capture varied data sets, insights, and representation from multiple roles within the 3 classified categories.

In total we collected 17 responses to the questionnaire from a variety of roles based across the organisations. Figure 2 (below) shows some of the roles identified by companies. Other responses included departments connected to: Innovation, Production, Prototyping and Textile Industrial Management.

Visualisation: Representation of perspectives

Which area is your role situated in the company?

More Details

Design	1
HR	1
Business	3
R&D	6
Marketing	2
Other	4
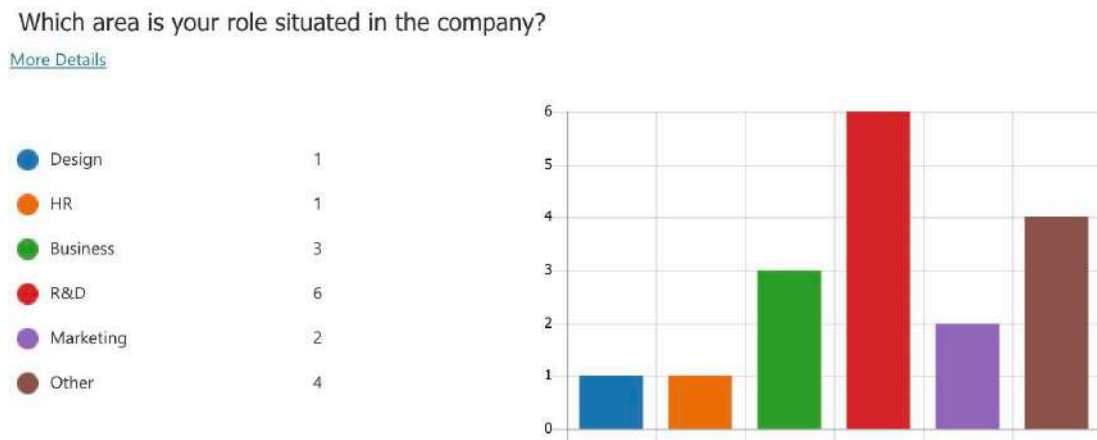
Figure 2. Roles within the companies identified in the responses to the questionnaire.

2.4.2 FASHION-TECH VALUES AND PRIORITIES: CURRENT AND FUTURE FOCUS

Key findings revealed that Sustainability through innovation and technology was overwhelmingly the priority for all FTalliance consortium partners, which **underpins the direction for all areas of the businesses**. Furthermore, the questionnaire responses highlighted a shared focus on circularity; exploring new business models; recycling, and waste reduction to create positive change in the industry. Interestingly, it was mentioned that a recent Circularity team now sits within the Innovation team.

Moreover, micro companies tended to explore a design, material aesthetic and concept driven

approach towards creating new meaningful experiences, business models and strategy. While Small, medium, and large companies tended to focus on innovation for **digitalisation, efficiency, and monitoring of the entire value chain**, including manufacturing technologies and 3D software modelling for integration between pattern making and production for a scalable market. These businesses also aligned on smart and bio-based materials. Large companies shared an additional focus on **traceability, automatic sorting and dismantling**, **digital selling B2B and B2C**.

Expected growth areas

When looking to the future and growth potentials, some key similarities in the participant views and responses emerged. These are listed below:

1) Companies of all sizes regarded **smart textiles and biomaterials** as areas of growth. These included shape-changing; sensors; biometric and functional simulations for fashion, and wearable technology.

2) Under the umbrella of sustainability and circularity, small, medium, and large companies foresee future growth areas in **digital ecosystems that use data to provide best practice and tools, with more automated and intelligent management of resources and projects**.

3) Digitising the entire design process opens up areas for growth with on-demand production and prototyping, 3D modelling and automatic cutting.

4) Large companies are very much focused on the potentials for **Industry 4.0** and the Circular Economy to radically transform waste management using modern smart technology. Data management is a key driver for future goals.

5) Micro and small companies see growth potentials in e-commerce and fashion as a service, large companies look specifically towards AR and digital omnichannel experiences.

6) Medium companies see growth for new roles and competencies to integrate a fashion and technology mindset.

Visualisation: WordCloud of priorities

As part of their responses, the consortium partners were asked to write 5 keywords that described their priorities/ambitions. Figure 3 (below) shows the resulting WordCloud with words sized by frequency of occurrence i.e. the largest word/s are the ones mentioned most frequently by the partners as keywords. Here one can clearly see the overriding significance of 'sustainability' to all partners followed by aspects including 'design'; 'technology', 'innovation', 'creativity', 'experience' and so on.

Figure 3. WordCloud with the most frequently occurring keywords in larger text.

2.4.3 COMPANY STRUCTURE

Findings are grouped below according to company size and structure:

Micro
1-3 employees, with 1 department encompassing all roles/departments. One role could work across Design Research, Branding & Communication, and Project Management. Company exists as a research/think tank lab in itself.

Small
11-49 employees, 4-5 departments including research labs such as Design & Prototyping, Materials & Sensors, Sustainability & Life Cycle Engineering and Production. Again, one role tends to work across multiple departments.

Medium
50-250 employees, 3-12 departments including several research labs and subdivisions that tend to have more specialist roles and semi-industrial equipment to produce samples for specific fashion-tech innovations and testing. These include labs for patternmaking and textiles functionalisation, technical/electrical and surface modification.

Large
260+ employees, 20-100 departments including hubs for innovation and research labs for specific functions. Many of the research labs are created in partnership with suppliers to focus on specific/specialist R&D and testing. **Investment in internal incubators and corporate start-ups enable large companies to drive innovation that infiltrates across the entire company**, such as 3D design which for one consortium partners now enters all departments.

Emerging insights

The emerging insights from the questionnaires correlate to the themes identified in the desk

research above (chapter 2.3), where it was identified that Micro and small companies tend to have a more '**agile approach' with multiple and overlapping roles taking place in an interdisciplinary studio/lab environment.**

Interestingly, although large companies have many more departments, they are made up of 'SME types' of departments – each exploring a specific Fashion-Tech focus/product embodied by expertise. The way in which micro and small companies work and are structured parallel the entrepreneurial approach found in incubators and start-ups, which exist as separate entities within large companies.

Routinely, micro and small companies do not tend to have HR departments, these seem to be introduced for medium sized companies as they grow in size.

The types of Fashion-Tech existing in company departments

Analysis of the questionnaires revealed that:

For **micro** companies, the focus is on the company's main expertise, which supports their unique position in the field. Specifically: **wearable tech, 3D design, smart textiles.**

Small companies have the same specific focuses but with the addition of **supply chain digitisation.** The types of departments working on these are: Design & Prototyping; Materials Engineering; Life Cycle Analysis; Digital Production; Sensors, and a Design Department leading a new production approach in line with the future digital strategies.

Medium companies had the same specific focuses as small/micro but with the addition of **digital manufacturing.** The types of departments working on these are: R&D; consultancy; testing; Product Development; Supply Chain; Pattern Making; IT, and Material Sourcing.

Large companies had an additional focus on **3D digital showrooms**. The types of departments working on these are: design team, pattern makers team, supply chain team, warehouse teams, industrial team, and the merchandising team.

Emerging themes

All sized companies surveyed are focusing on **wearable tech, 3D design and smart textiles.** As the companies grow in size, the focus grows towards scalable supply chain digitisation and digital manufacturing (see visualisation below in fig. 4), which are linked to sustainability goals and data mentioned above in Values & Priorities.

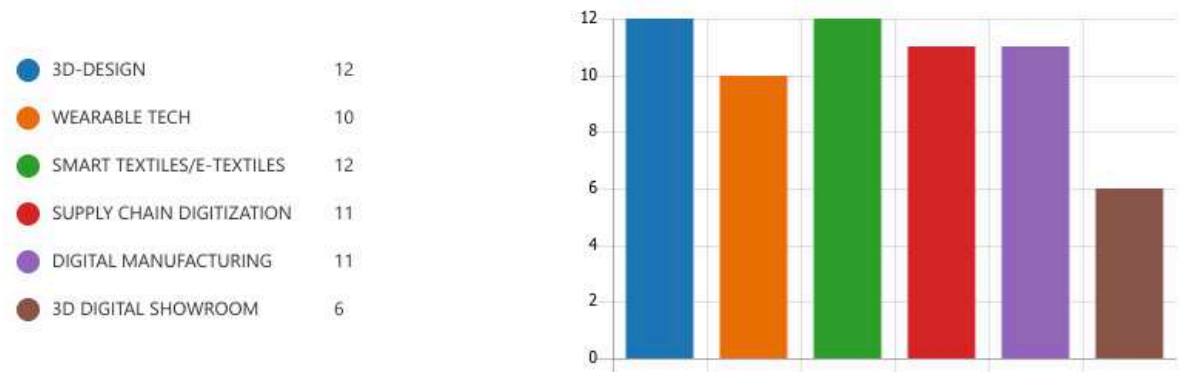13. Which of the following terms exist in the company?

More Details

🔵 3D-DESIGN	12	
🟠 WEARABLE TECH	10	
🟢 SMART TEXTILES/E-TEXTILES	12	
🔴 SUPPLY CHAIN DIGITIZATION	11	
🟣 DIGITAL MANUFACTURING	11	
🟤 3D DIGITAL SHOWROOM	6	

Figure 4. Fashion-Tech areas within companies.

Fashion-Tech upskilling, training programmes and internal academies

Analysis of the questionnaires also revealed that micro companies train employees and interns on an ad-hoc basis, on the job. They do this through creating space for hands-on experimentation with materials and techniques and by sharing best practices:

> *We have our own library of online and offline resources that are shared with team members, and we actively create a space for exploration and experimentation to share and further develop skills and knowledge within the team* (anonymous/micro: 2021)

Small companies have a big emphasis on updating design and manufacturing processes - using/working with software, but do not tend to have internal training. Part of the role is to use advanced software and keep up to date with self-training and upskilling.

Medium companies have no or minimal internal training programmes.

Large companies invest heavily in internal training programmes, courses, and academies. They offer integrated fashion-tech skills programs that fit with job needs and upskilling. These are managed by **HR, internal fashion-tech start-ups, and Skills Manager,** e.g., for 3D Modelling software:

> *HR is running our 'XXX University' where courses can be followed. Corporate start-up XXXXX is driving 3D Design training and the development of 3D design skills* (anonymous/large: 2021)

One insight shows that **micro, small and medium companies also offer their expertise externally through consultancy services to large companies.** This service is to help implement innovative technologies into products, and offer innovative design approaches, methods, software tools and techniques through customised workshops and training. These external facing fashion-tech training opportunities are offered both online and offline.

2.4.4 FASHION-TECH JOB ROLES WITHIN DEPARTMENTS

The consortium partners were asked to list the job role titles involved in Fashion-Tech in their company. Figure 5 WordCloud (below) shows the clustering of Fashion-Tech roles within the

companies sized by frequency with the most frequently occurring roles larger in scale. Interestingly, as the visualisation highlights, the most recurrent roles connect to: *Innovation Management*; *Designer*; *3D Patternmaking*, and many distinct types of *Engineering* roles such as those related to *materials* and *prototype testing*.

Figure 5. Fashion-Tech job roles within company departments.

Fashion-Tech activities within departments

Furthermore, the below analysis shows that roles and activities mix and merge in micro and small companies and become more specialised in medium companies. Medium companies collaborate with large companies to develop innovative novel products.

The types of activities covered in Fashion-Tech roles according to company size are as follows:

Micro
The job roles that involve fashion-Tech in Micro companies tend to be very senior positions that build, shape, and drive the vision for the business. These roles include **Creative Director, Head of Innovation and Head of Creative.** As noted above, Micro companies have 1-3 employees, this means that senior roles carry out multiple positions and activities, with additional specialist roles connected to main title, such as **Smart Textile Designer/Researcher**, and **Branding and Communication Manager**.

The activities in senior positions focus on company vision, creative concepts, design research, project management, project acquisition, networking, public speaking, consultancy, and educational activities.

The more specialised associated roles involve material exploration, textile development, product engineering, fabrication, and testing; qualitative studies/field research. They also

include external facing activities that share company vision through storytelling and content development for social media and press.

Small
Similarly, to Micro companies, **roles within an organisation tend to merge and mix, as knowledge becomes an essential element of evolution and growth** as revealed in the quote for one respondent below:

> Cross-disciplinary knowledge is indispensable for a conscious and pioneering approach, borrowing multiple knowledge from different production fields helps our approach to innovation free from the orthodoxies typical of some productions that are not inclined to innovate (anonymous/small: 2021)

The job roles that involve Fashion-Tech in small companies tend to fall across the management of the whole design and production process and involve collaborating with industrial partners. The activities fall within areas of R&D, experimentation, and production, and rely on strong specialism requirements. Teams are made up of Innovation/Team/Project Managers, required expertise and technicians.

Importantly, it is essential and expected for a designer in a small company to understand all stages of product design and development process and be able to use software tools. While an engineer is expected to already be specialised in Systems, Materials, Electronics & Production/Industrial Engineering.

Medium
The main types of fashion-tech activities are **R&D and test performance** – within this pattern making, prototyping, material sourcing, quality assurance, design, and IT projects take place.

Consultancy is a big activity in medium companies – advising and collaborating with companies and designers to develop innovative novel products. This activity relies on medium companies leading with specific expertise that involve **specialist roles such as Research Scientist**, and **use/know how of semi-industrial equipment** to produce samples for specific fashion-tech innovations and testing.

Large
The main types of activities fall within the **design, development, creation, production and industrialisation** of new products and components.

Large companies are focused on the potentials for Industry 4.0, circularity, and data management; therefore, **activities and tools surrounding supply chain are especially important**.

2.4.5 FASHION-TECH JOB ACTIVITIES AND ROLES

Fashion-Tech job role scene

The Fashion-Tech job role scene is ever changing and evolving, responding directly to technology itself constantly being updated, as well as the context of a changing world. This questionnaire was sent out during the Covid-19 pandemic, it captures fresh information to improve our understanding of Fashion-Tech during this period, which also helps highlight the needs of our changing society and the fashion industry.

As physical shifts more to digital, we asked: **how does that affect job activities/roles?**

For all sized businesses it was acknowledged that all partners are fully immersed on the topic and **already working in the digital space**.

> We already use digital tools in Design, Prototyping, Supply Chain, Production, etc, and we consider these competencies and skills already as mandatory, for our employees, present and future (anonymous: 2021)

Prototyping is also a key approach for all sized companies, with all or a wide range of roles involved in experimentation and mocking-up innovative ideas – 'All our activities involve this approach; this is the way we always work' (anonymous: 2021).

Although social networks, processes, approaches and values are changing traditional fashion products, production and interactions, **digital skill improvements and communication was highlighted as affecting job roles and activities due to new parameters impacting the increased speed of digital presence in everyday** life: 'The shifts require an improvement in competencies and a change in some processes, also in how we collaborate with our clients' (anonymous: 2021).

A digital approach and use of tools were noted as mandatory and essential to all companies, with employees having the **skill set to implement change whilst being agile and open to new ways of working**:

> *Today more than ever is crucial to have a digital approach toward a world that is changing its production paradigm. Digital systems now are for us essential as well as for the digital prototyping and digital production that are going to replace the traditional production methods* (anonymous: 2021)

Finally, for smaller companies, while team members are also expected to have sufficient knowledge of digital design tools and machines depending on their role (3D modelling/printing, generative design tools, laser cutting, digital weaving/knitting/embroidery), the relationship between **craftsmanship and digital** was noted as an important focus, considering the machine and the human hand (the hand of the maker).

New job roles in Fashion-Tech

There are no new job roles in micro and small companies, however as established previously, smaller companies have a more flexible and interdisciplinary company structure. This means roles can mix, flex and bend depending on the projects and take an agile approach to company directions.

Both medium and large companies see growth in new job roles that have been created in 3D software, data and circularity, see list below:

•   Medium: 3D Pattern Maker, Consultant Circular Economy, Consultant Circular Textiles

•   Large: Component designer, 3D Software Trainer for Fashion Designer and Pattern Maker, Data Manager (Fashion-Tech and Supply Chain).

Interdisciplinary activities/roles

Building on 'interdisciplinary' being a key skill and role from WP1.1 Focus Group findings, the questionnaire unpacked this area further to understand how team members work across the company, and how these activities/roles are shared.

Micro companies are interdisciplinary based and led, meaning that all roles need to combine and contribute two or multiple disciplines into an activity and business as noted in the respondent quote below:

> The company **structure is built on interdisciplinary roles,** the role of design researchers in the team in that sense is not fixed to a narrow description but is constantly shaped and shifted depending on the person's skills and interest (anonymous/micro: 2021)

Interdisciplinarity within a micro company is a critical mindset and approach because many projects are based on collaboration with other fashion brands, research centres or universities: 'The ones leading the projects and shaping the content, needs to have interdisciplinary know-how' (anonymous/micro: 2021).

This filters into recruitment where they seek **candidates who are hybrid** in terms of knowledge and skills: 'They can have a fashion or textile background, but may also have a product engineering, interaction design or industrial design background' (anonymous/micro: 2021).

Small companies employ roles such as Innovation and Project Managers who lead and organise projects that involve interdisciplinary competencies and skills, and therefore direct the desired activities and roles for the project needs.

Medium companies tend to employ fixed specialist roles, however interestingly in large companies there seems to be multiple ways in which interdisciplinary teams and knowledge sharing occurs. The following are some examples:

- Individual employees working across departments but in the same role to share knowledge and input different perspectives.

- Working as part of a project team but in mixing jobs/tasks.

- Projects are managed and integrated via hubs – there is one hub per job type (design, supply, innovation etc).

2.4.6 SKILLS FOR FASHION-TECH INDUSTRY

Current Fashion-Tech skills

Consortium industry partners reflected on the current skills the company engages in relation to Fashion-Tech:

3D software, digital tools, data, programming, and problem-solving capabilities specific to design, prototyping and production were mentioned across all sized businesses.

More specifically, knowledge on textile technologies and production, and 3D pattern-making are

current Fashion-Tech skills however there will be more investment in the future for these teams.

Practical skills relating to fashion design, textile engineering and industrial/interaction design engage in **research** skills, **concept development**, **ideation**, and **reflection**. One company said the skill focus is on design sensibility and material aesthetics, with a collaborative, open-minded mindset.

Fashion-Tech skills companies struggle to find

Fashion-Tech skills are seen as emerging and growing, therefore training employees with new skills is recognised as part of ongoing business transformation.

Some specific skills mentioned that companies struggle to find:

•   Knowledge of how to produce garments with integrated technology on an industrial scale.

•   A hybrid combination of skills for an interdisciplinary approach.

•   Textile fabric experts and textile engineers who have skills and knowledge of industrial machines to create new yarn or fabrics.

Emerging skills of the future

Consortium industry partners were asked to share their predictions on what they considered are the emerging skills that will become more important for future employees. Below captures some of their responses:

Skills related to **recycling and circular design and material processes** were highlighted as key for future employees as sustainability is the priority for all FTalliance consortium partners and underpins the direction for all areas of businesses.

The significance of sustainability extends to predicted emerging fashion-tech skills related to **bioengineering and the development and growing of biomaterials**. This would require skills related to **design ethics (philosophy of technology), equity-centred design (participatory design/co-creation skills), and digital design skills (programming; 3D modelling; digital textile design)**.

Masters in 3D software design, and other software that links to supply data management will be desirable.

Finally, the predictions included that candidates will need to be flexible and adaptable to working in interdisciplinary, multidisciplinary ways and via remote approaches, and will have experiences that enable them to **understand multiple industries** that will revolutionise the fashion industry. Hybrid and entrepreneurial qualities are noted as essential skill sets and positive mindset for the future.

Visualisation: Fashion-Tech Skills Priorities

The consortium partners were asked to list in order of priority which Fashion-Tech skills and roles they considered most important for their company. Figure 6 (below) shows the breakdown

and order of terms selected for the different sizes of organisations.

Unsurprisingly Sustainability, Circularity and Product Innovation and Entrepreneurship were selected the most as the colour distribution in fig. 6 reveals.
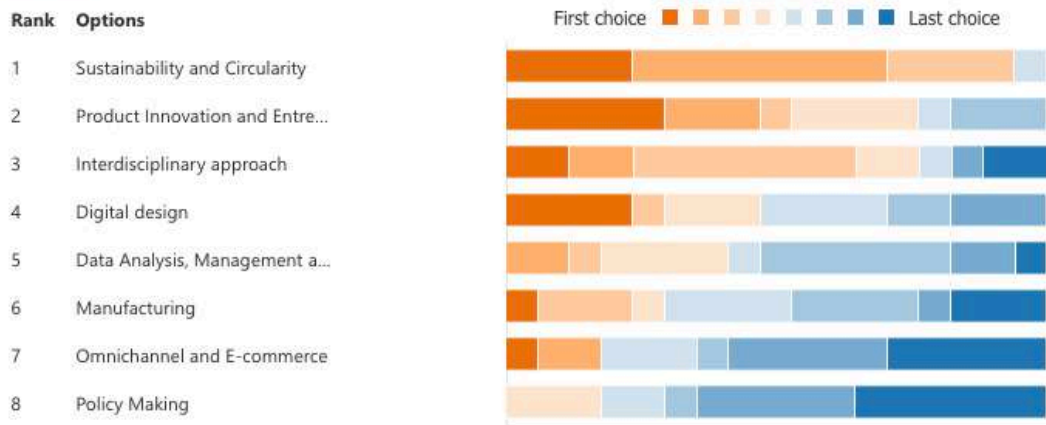

Figure 6. Fashion-Tech skills needed within companies.

2.5 CONCLUSIONS, RECOMMENDATIONS and FINAL THOUGHTS

From the desk research and the questionnaire, the following summary and conclusions can be made.

- **Sustainability through innovation and technology** was overwhelmingly the priority for all FTalliance consortium partners which underpins the direction for all areas of the businesses.

- Growth: companies of all sizes see **smart textiles and biomaterials** as areas of growth. These included shape-changing, sensors, biometric and functional simulations for fashion and wearable technology. And **digital ecosystems** that use data to provide best practice and tools, with more automated and intelligent management of resources and projects.

- All sized companies are focusing on **wearable tech, 3D design and smart textiles.** As the companies grow in size, the focus grows towards scalable supply chain digitisation and digital manufacturing which are linked to sustainability goals and data.

- A **digital approach** and use of tools were noted as mandatory and essential to all companies, with employees having the **skill set to implement change** whilst being agile and open to new ways of working.

- Fashion-Tech skills are seen as constantly emerging and growing, therefore training employees with **new skills** is recognised as part of an ongoing transformation.

- **Prototyping** is also a key approach for all sized companies, with all or a wide range of

roles involved in experimentation and mocking-up innovative ideas. "*All our activities involve this approach; this is the way we always work*."

These findings capture the zeitgeist of current trends and an uncertain and changing landscape of Fashion-Tech in the wider context of the fashion industry.

All sized companies are navigating and responding to the impacts of the Covid-19 pandemic, whilst continuing to look ahead to **galvanise on digital accelerations and drive innovation**. For all sized businesses, it is acknowledged that all partners are fully immersed on the topic and already working in the digital space.

Fashion-Tech skills are seen as constantly emerging and growing, therefore **upskilling and training employees with new skills is recognised as part of an ongoing digital transformation.** The findings highlight the evolution of current Fashion-Tech roles and the eagerness for sustainability through innovation and integrated technology. The keenness for interdisciplinarity opens up siloed departments to enhance knowledge sharing and collaboration from a multiplicity of perspectives.

These insights establish the types of Fashion-Tech roles across micro to large organisations and begin to map which department(s) they are placed. It offers an **understanding of how and where future graduates can identify themselves with roles to aim towards and** supports the WP1 T1.2: Staff Learning Mobilities, and the 12 Partner Portfolios, which aim to bring to life and visualise findings from the questionnaire. The findings are very much in line with what was reported in the latest *State of Fashion 2021* report by McKinsey and BoF where it states:

> The pandemic has occurred at a moment when manufacturing technologies are leapfrogging forward. Particularly when compared to other manufacturing industries, apparel production has a great deal of room to digitise and reap the benefits
>
> (Lund, S. & Mekala, K.: 2021 p 81)

There is an openness and excitement for Fashion-Tech to grow across a range of roles and areas and be a point for leadership for the business.

These findings will be used for the final stage of WP1 T1.3: Job prospects and Career services – where further investigation between HR and HEIs can be unpacked and responded to within planning and recommendations for future recruitment (see Report 1.3 and Industry podcasts).

Note, the questionnaire offers a wealth of data extending beyond this report and will support and inform the development of future work packages.

3. INTERACTIVE STUDY VISITS

3.1 INTRODUCTION

As stated in the section 2.1 (above [p.11]), due to Covid-19 pandemic restrictions, HEIs have not been able to travel and carry out the WP1 T1.2 Mobility Study Visits to the industry partners based across Europe. Instead, a redesign by the consortium relocated the physical study visits to online ones. This established a rich alternative form of industry and HEI partner engagement in digital format. UAL ran two workshops in early 2021 (26 January and 9 February) to discuss how to revise and rework the virtual study visits. New opportunities were identified by the partners to develop 3 online study/learning mobilities – Interactive Study Visits to be hosted by

3 of the industry partners with planning input and support provided from the HEI partners.

As part of the re-design of WP1 T1.2, UAL also communicated with each consortium partner regarding the completion of their own portfolio to showcase their physical labs, resources, prototypes etc., in digital format.

3.2 SET UP AND PROCESS OF INTERACTIVE STUDY VISITS

<u>**Aim**</u>

- To trigger the knowledge exchange between companies and universities through virtual study visits.

- To bring to life the virtual study visits by showcasing them on the FTalliance website and in a digestible visual report to represent the integration of knowledge exchange across HEIs and companies.

<u>**Rationale**</u>

To build on the FG outcomes and findings (WP1: Future Job Roles in Fashion-Tech) with a focus on interdisciplinarity, recruitment, education, and Fashion-Tech roles. The outcomes **proposed a set of 8 themes and questions for the study visits that academics and industry partners** will expand on for deeper insights.

8 themes identified from Focus Groups T1.1:

- Interdisciplinary
- Design
- Omnichannel & E-commerce
- Sustainability & Circularity
- Product Innovation & Entrepreneurship
- Data Analysis, Management & Governance
- Policymaking
- Manufacturing

<u>**Methods**</u>

A methodological approach was proposed to outline how academics from the 5 HEIs and 8 industry partners would work together to develop and participate in the Virtual Study Visits. This included workshops, proposal development and review points. The framework presented a **co-creation and exploratory approach to define aims and objectives for the redesign of the Mobilites study visits.**

Participants would be FTalliance consortium partners only, however, would involve inviting and hearing perspectives from staff working within roles from different departments across the company (e.g., design, HR, research, technicians, etc), who were deemed to have Fashion-Tech profiles. All partners were asked to decide which workshops to contribute to and confirm attendance to one or more.

Figure 7. Exploring contributors to the interactive study visits.

Miro software was chosen to visually document and capture thoughts and insights during the 3 virtual mobilities. Miro is an online collaborative whiteboarding platform that enables distributed teams to work effectively together, from brainstorming with digital sticky post-it-notes to planning and managing agile workflows. The mobility's were also recorded for research purposes.

To produce digestible visual reporting on Staff Learning Mobilities to represent the integration of knowledge exchange across HEIs and companies. The outcomes are documented and disseminated through photos, newsletter and articles published on the project platform and social media networks. Any confidential or personal data will be anonymised to allow the report to be shared publicly, with the approval of the companies involved. Results from WP1-T1.2 formed the basis of WP1.3.

Process

Three Consortium industry partners were invited each to host one of the virtual mobility study visits – PVH, DECATHLON and PESPOW.

UAL designed and delivered two workshops and as described above invited all partners to co-plan the Virtual Study Visits. The process for this is detailed below:

Co-creation planning workshop 1: January 2021

The workshop involved 4 key activities:

1. **Introduce all partners to Miro** to test and experience the interactive software ahead of the virtual study visits. Miro will be used to capture and share insights so familiarity with the software is critical. The two images below show how Miro was used in the workshop.

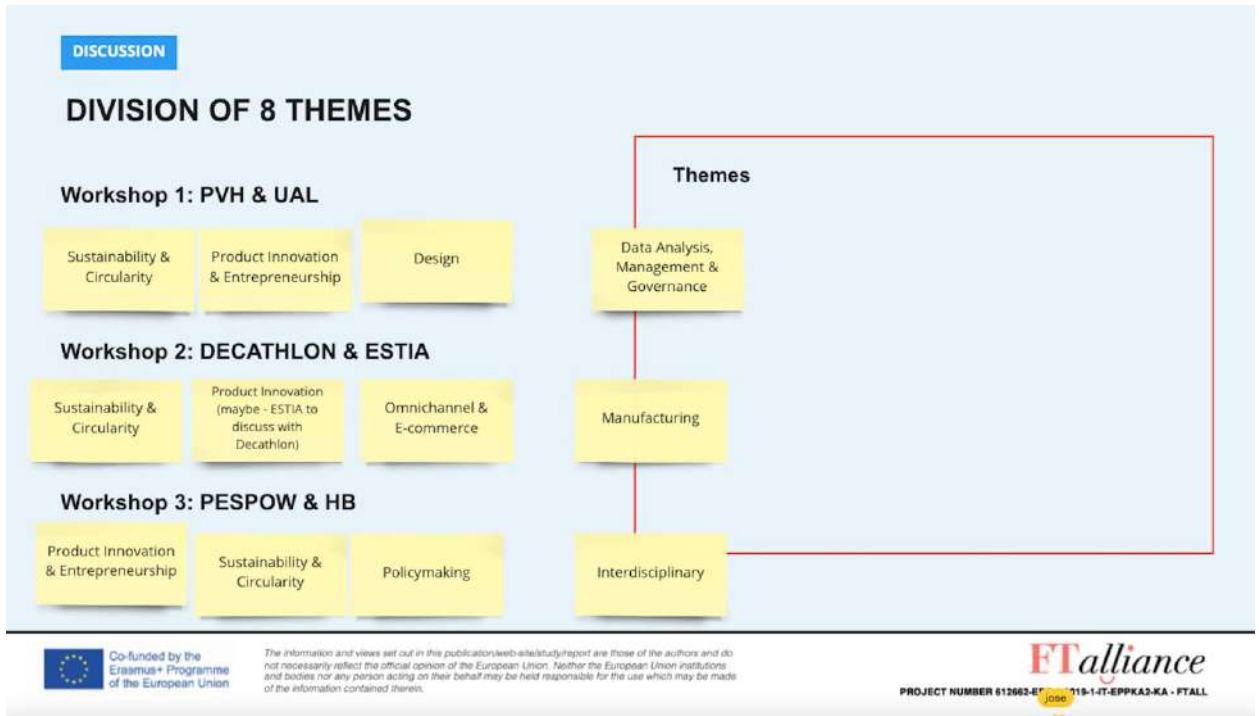2. **Division of 8 themes** (outcomes from focus groups) across 3 workshops.

Figure 8. Allocating themes to the interactive study visits.

3. **Discussion to define each x3 interactive workshop with selected themes** for PVH, Pespow and Decathlon – rationale / desired outcomes / formats / presentation / tour content.

4. **Define overarching rationale for the 3 mobility study visits** to understand what relevant information, topics, content, and outcomes we want to get out of these 3 workshops and why.

Figure 9. Define the overall rationale for the 3 workshops.

Listed below are the 4 key themes that were structured into the Miro Boards to obtain insights:

1) **Competences:**

   • How competencies and roles can be grouped into Fashion-Tech personas

- Challenges of developing the required competencies

2) New roles:

- New roles and how to build them
- Individual and team workers

3) Interdisciplinary:

- How are people ending up/moving into those roles?
- Overlaps in roles (e.g., the landscape/variety of design roles, and interaction between design and data analysis)

4) Success, failure, and challenges:

- What have we learnt?
- Shared experiences across consortium
- Fashion-Tech not static, constantly evolving discipline

Evaluation Tool matrix

These 4 key headings were used to design and develop the content for the 3 study visits, as well as providing the evaluation tool to sum up partners thoughts and ideas in relation to content discussed in the workshops. The matrix below shows the template for the Miro board where partners are asked to share their thoughts by adding sticky post-it-notes to the 4 headings.
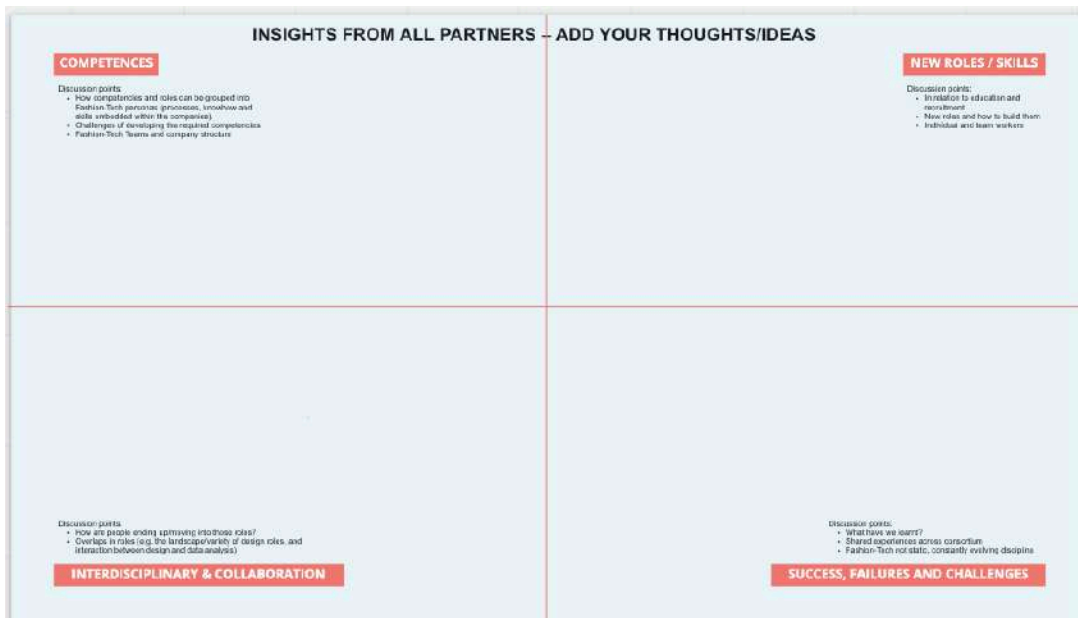

Figure 10. Miro Board design with 4 Headings to capture insights.

Following on from this workshop, the three industry hosts were asked to develop a proposal for their virtual study visit with the support from an allocated HEI partner: PVH & UAL; PESPOW & HB; DECATHLON & ESTIA.

Co-creation planning workshop 2: Feb 2021

The second follow-up workshop asked the three hosts to present their proposals for their virtual study visit to all the partners to discuss, review, and finalise. The content created is discussed below for each interactive study visit of PVH, Pespow and Decathlon.

The 12 Partners Portfolios were also explored in the workshop to understand how all the partners could present and showcase virtual tours and presentations.

Summary

To sum up, the three hosts designed, developed, and delivered their study visits with support from their allocated HEI. Each host created and presented content in the format of presentations, film, interviews, and live virtual tours to offer insights into the background, priorities, size and structure, culture, and ethos of each company. Employees were invited from different Fashion-Tech roles to share multiple perspectives, expertise and disciplines from across the company. This gave insights into the various Fashion-Tech roles, teams, and departments in their organisation, as well as the types of projects they are working on.

Topics were discussed and explored under the allocated themes which offered insights beyond the focus group outcomes. There were varied elements of online interactive elements such as round-table discussions, debate, and webinar with Q&A. All study visits included the use of the Miro board.

3.3 INTERACTIVE STUDY VISIT UAL/PVH

3.3.1 INTRODUCTION
The first interactive study visit was hosted by PVH Europe, Amsterdam on March 1, 2021. The company is recognised as a global powerhouse in the fashion industry with iconic brands such as *Calvin Klein and Tommy Hilfiger.* With strong leadership, aspirational product that connects with consumers, and a commitment to corporate responsibility, PVH are building on their core strengths and leading the apparel industry in sustainability, innovation, inclusion and diversity, and philanthropy. '*Forward Fashion' is PVH's strategy to transform how clothes are made and (re)used, and the actions they are taking to move the business and the fashion industry to a more innovative and responsible future*. The mission 'Forward Fashion' has three strategic focus areas:

• reduce negative impact to zero
• increase positive impact to 100%
• improve 1 million's + lives across the value chain

Following the topics from the focus group held on June 2020 the mobility workshop key areas of exploration were **Sustainability and Circularity, Product Innovation & Entrepeneurship** and **Design**.

3.3.2 INTERACTIVE STUDY VISIT
The interactive study visit held on Microsoft Teams was divided in two parts. The first part addressed the Innovation Strategy of PVH presented by Puk de Jong supported by a short video clip illustrating the content. Alvaro Pin Hurtado from start-up *Hatch* then presented their digitalisation B2B selling strategy followed by a Q&A. The session was annotated live on a Miro Board (figure 11-13). After a short break, start-up *Stitch* presented the progress in the

digitalisation of 3D design also followed by a Q&A. The study visit ended with a brainstorming session where all the participants were invited to share the findings and feedback (see figs. 15-19).

3.3.3 AGENDA

- *Introduction - José Teunissen (UAL) –Gabrielle Miller (UAL)*

- *PVH general introduction, Innovation & Sustainability - Puk de Jong (PVH).*

- *Hatch (B2B digital selling) - 20 min presentation by Alvaro Pin Hurtado (head of Growth Hatch) + 10 min - Q&A*

- *Break*

- *Stitch (3D Design) - 20 mins: presentation Emily Roosen + 10 mins -Q&A*

- *Closure discussion - José Teunissen (UAL) –Gabrielle Miller (UAL)*

3.3.4 FINDINGS AND FEEDBACK

PVH values and innovation strategy

Make Fashion better for good.
Innovation is at the heart and soul of PVH (fig. 11 [below]). The company has set out an innovation vision with the leadership team. Their Innovation Ecosystem (fig. 13) consists of a wide variety of external partnerships with innovation themes based on PVH strategic priorities (fig. 12), such as accelerators and start-ups. The new PVH campus in Amsterdam is designed to drive collaboration and innovation - to be used by flexible working teams with a focus of health and well-being. The Fashion-Tech workspaces are using Tech + AI to make better decisions. In addition, there is a Denim centre of excellence, dedicated to circular denim. Successfully proven new Business opportunities are translated into digital ventures. Recently they have aligned two start-up businesses, *Stitch* and *Hatch*, to their teams to help them to digitalise the full supply chain as well as the wholesale experience for example moving from traditional *showroom* to a virtual *catalog* experience (see fig. 14 [further below]).
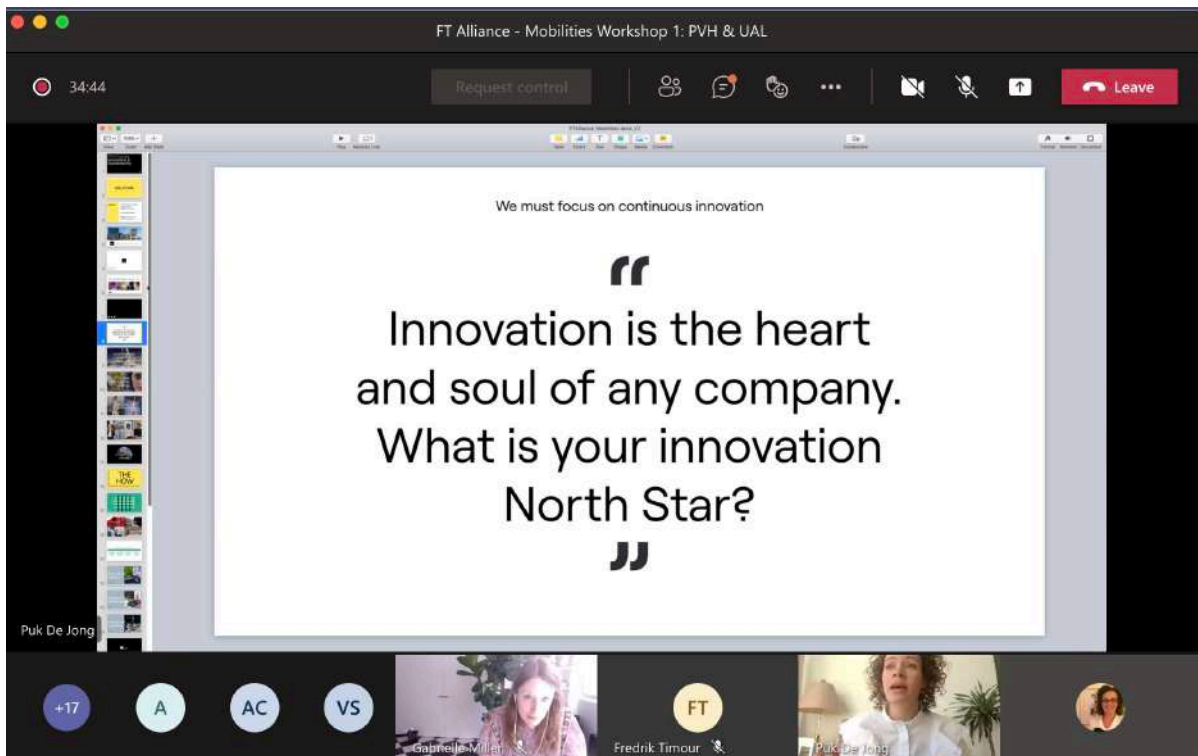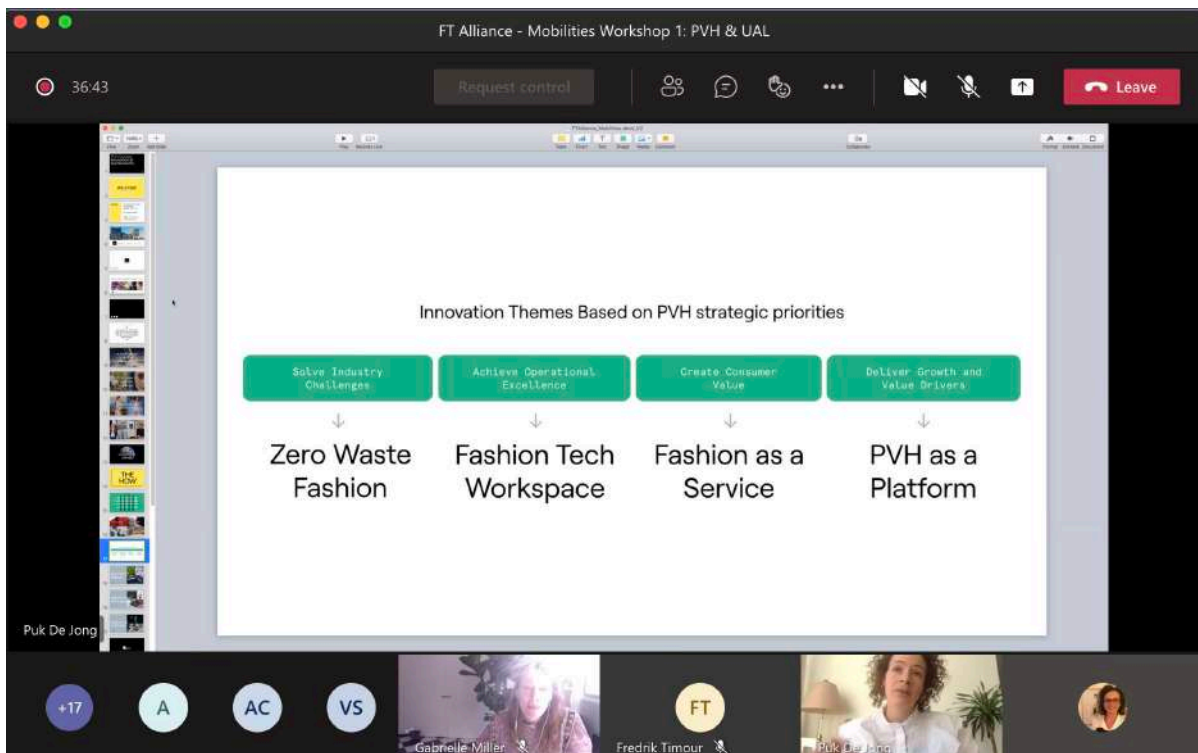
Figure 11. PVH: Innovation Strategy.
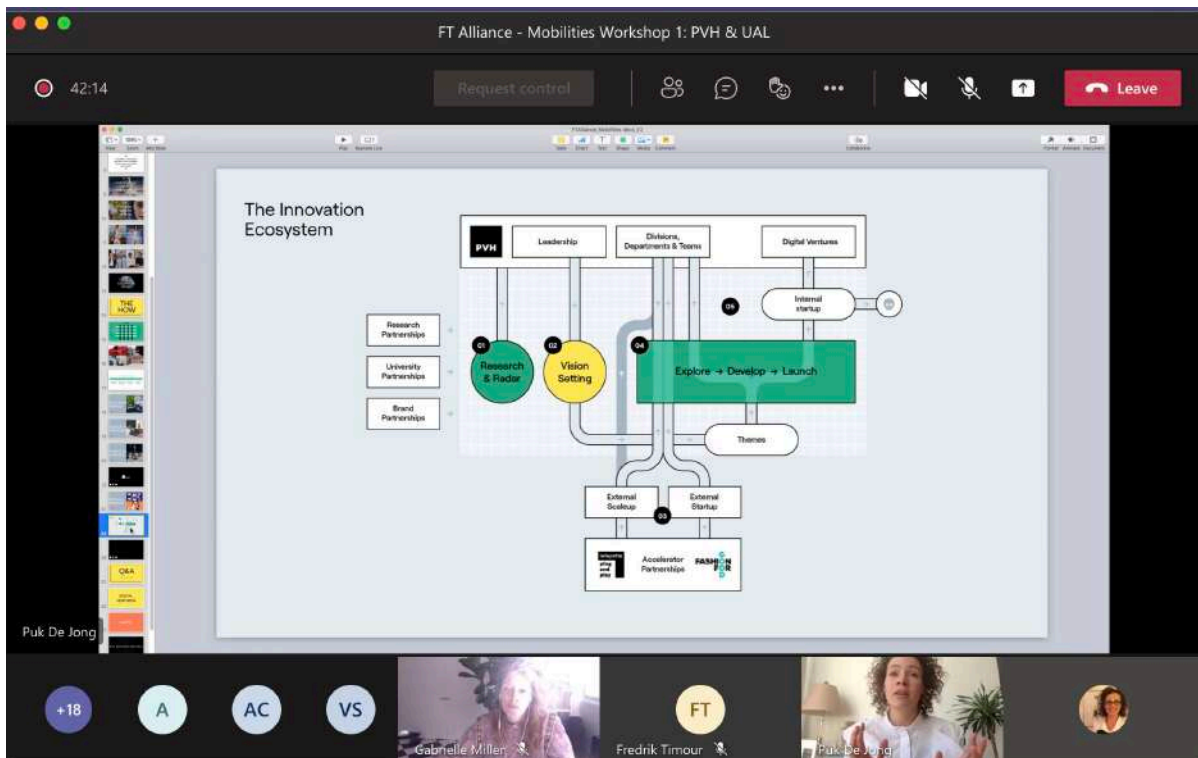

Figure 12. PVH: Innovation Themes.
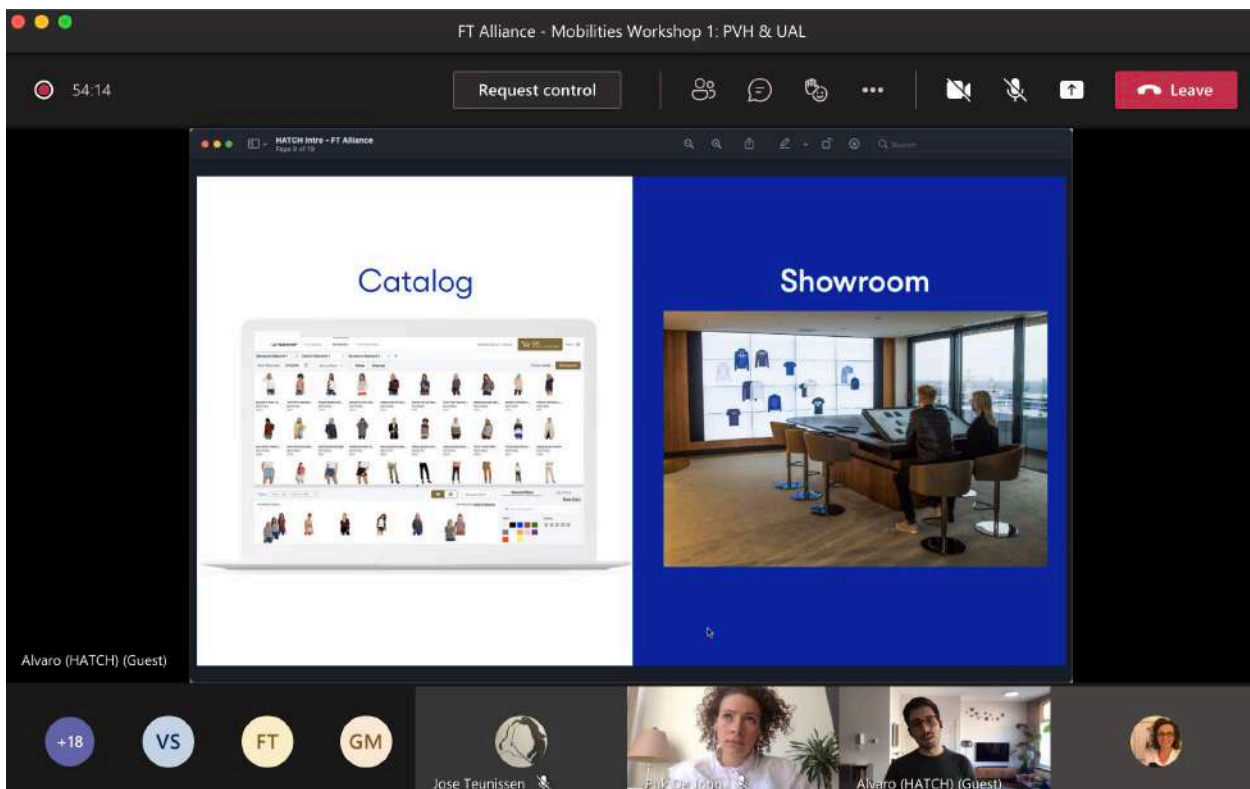
Figure 13. PVH: Innovation Ecosystem.

Figure 14. HATCH: Digitalisation – virtual *showroom* and *catalog*.

PVH is continuously educating itself as a business, this is the reason the company is partnering with FTalliance. PVH foresees a future as a platform for social, shopping, digital fashion (the Uber of fashion) as well as PVH as a service offering bespoke solutions to fit, to virtual try on

and personalisation. They are currently working on tailored sizing for consumers, data matched to (personalised) design and collections digitally modelled on individual consumer's body shape.

The PVH Europe Innovation team is supporting the execution of these focus areas by executing innovation projects in four streams:

•   Product

•   Digital

•   Business (focus on development of new business models)

•   Culture (overarching theme with a focus on mind-set)

3.3.5 RECOMMENDATIONS/OUTCOMES OF THE INTERACTIVE STUDY VISIT

The last section of the Interactive Study Visit was a brainstorming session to gather insights and findings from all participants under the 4 categories of 'Competences'; 'Interdisciplinarity & Collaboration'; 'New Roles/Skills and 'Success, Failures & Challenges'. The responses were inputted/captured in 4 quadrants of a Miro Board (see screenshots below: fig. 12 for Miro Board layout and figs. 13-15 for focus on comments within each quadrant).
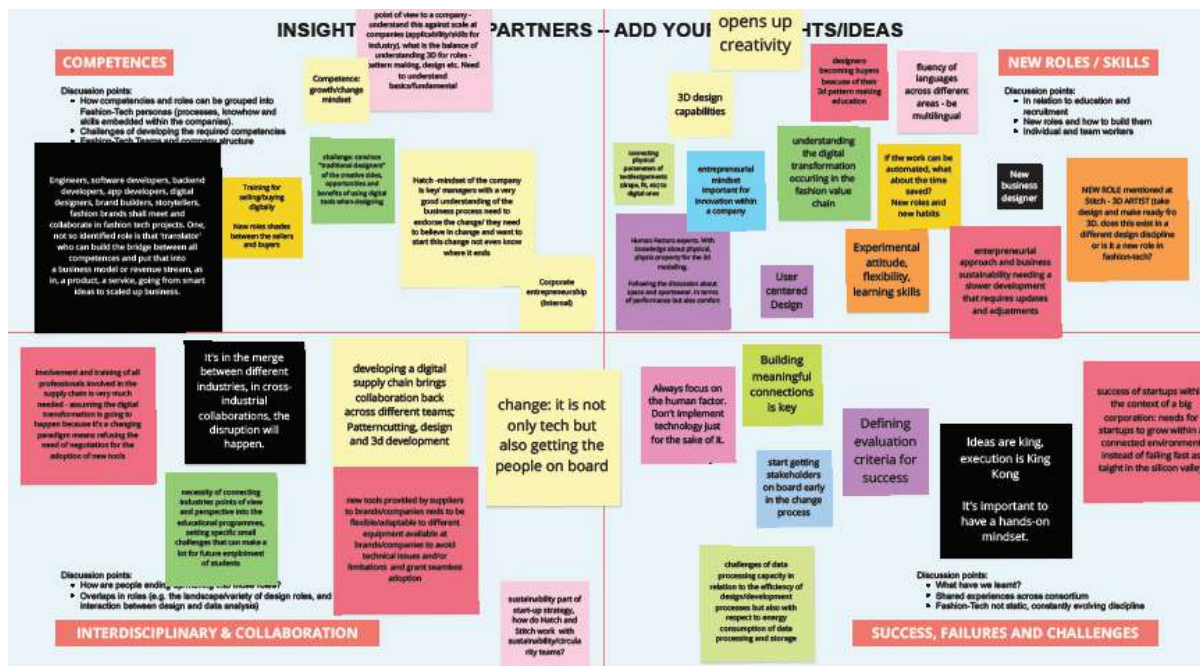

Figure 15. PVH Interactive Study Visit: Overview of Miro Board.
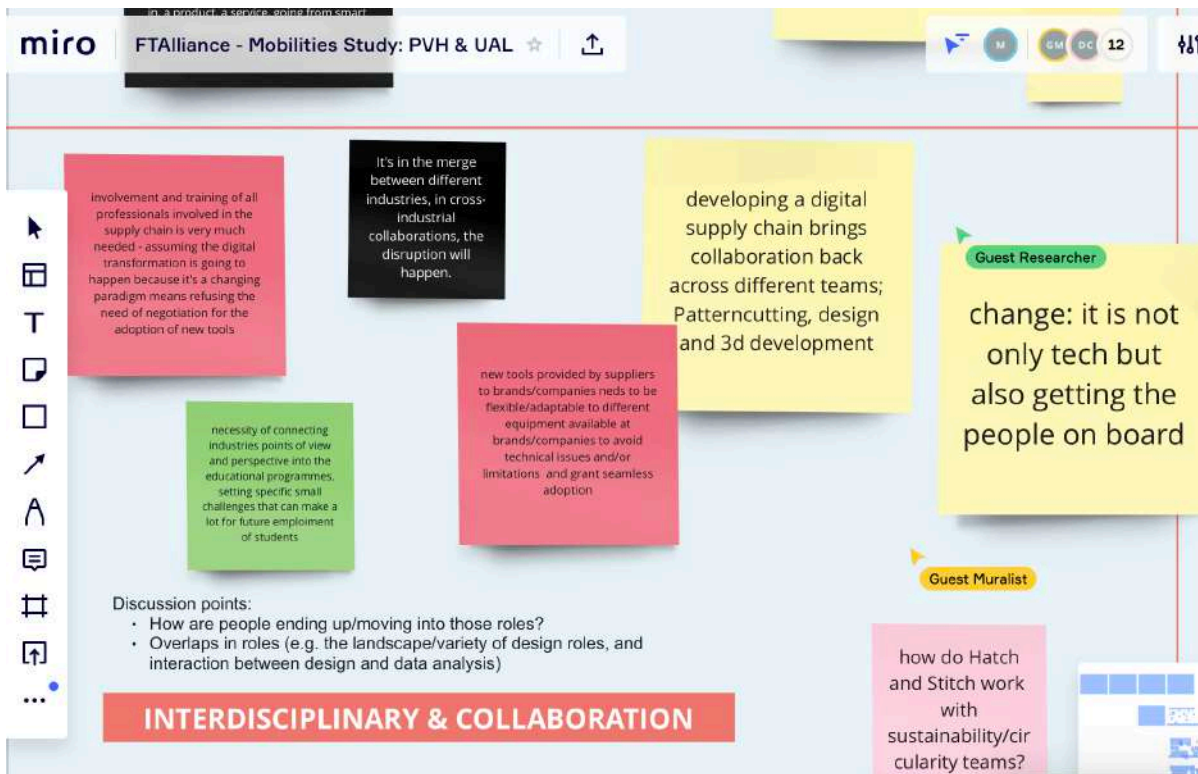
Figure 16. PVH: Quadrant 1 'Competences'.

Figure 17. PVH: Quadrant 2 'Interdisciplinarity & Collaboration'.
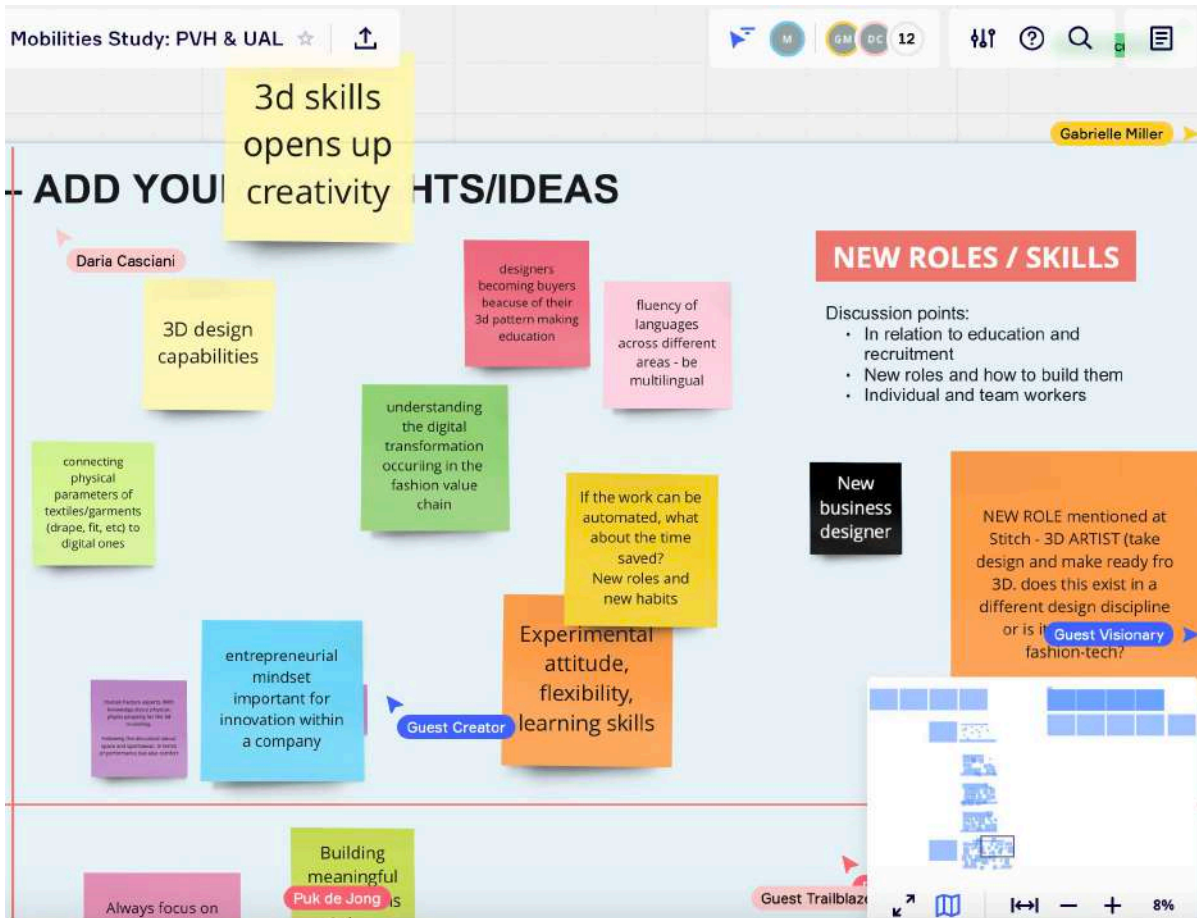
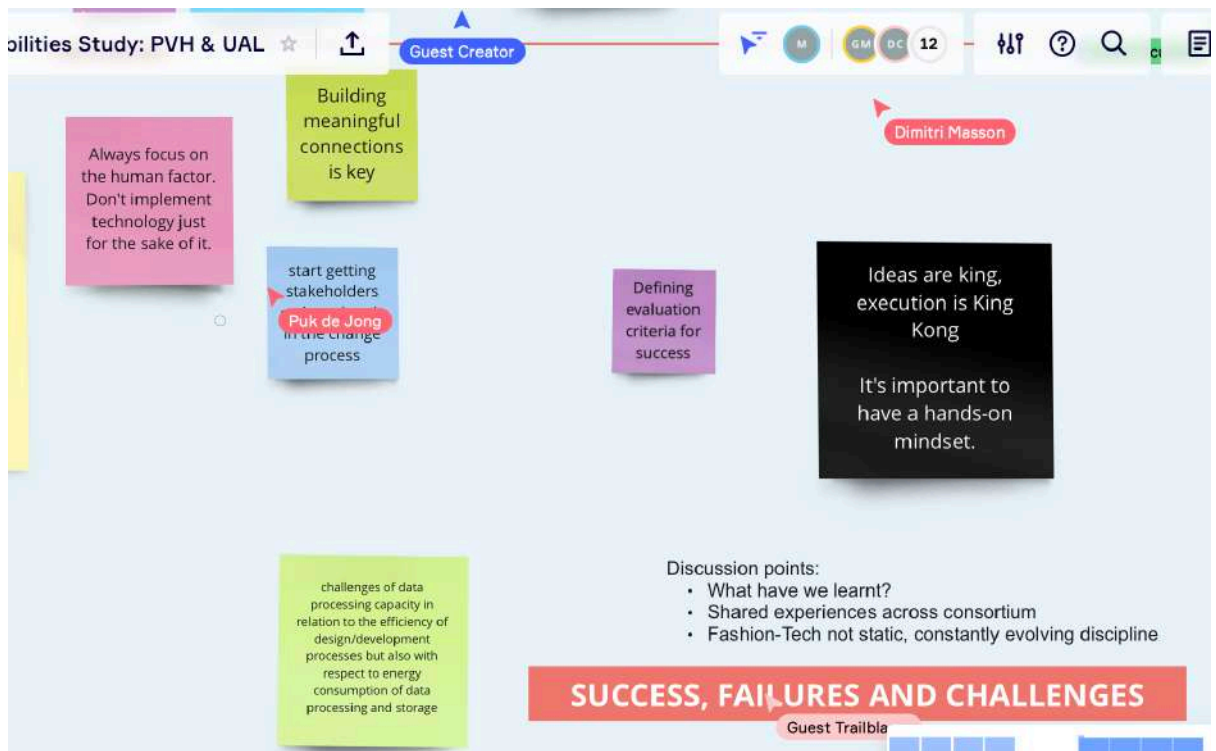**Figure 18. PVH: Quadrant 3 'New Roles / Skills'.**

Figure 19. PVH: Quadrant 4 'Success, Failures and Challenges'.

The most important recommendations and findings are detailed below:

Engineers, software developers, backend developers, brand builders, storytellers and fashion brands must collaborate in Fashion-Tech projects. Therefore, it is important to have someone on board (an innovation manager), who can build the bridge between all competences and put that into a business model or revenue stream, as in, a product, a service, turning a smart idea into a scalable business. Hatch highlighted that manager do need to have a good understanding of the business process to be able to endorse the change. In addition, they need to believe in change and dare to start the change process not knowing where it will land. The success of a Fashion-Tech start-up within a big corporation is depending on how it is connected and embedded within the company environment.

To make a successful digital change an involvement and training of all professionals of the supply chain is required since the digital transformation needs a paradigm shift where adoption of new tools is essential. Developing a digital supply chain makes collaboration key across different teams such as pattern cutting, design and 3D development. Building meaningful connections within those teams and within the company is important. Hands on mind-set and ability to translate are essential skills for future designers who need to be able to connect physical and craft knowledge of textiles and garments with digital. The positive results of a digital supply chain are that it brings back collaboration across different teams in terms of pattern cutting, design and 3D development and secondly it offers a renewed focus on the craft and design process.

The following new job roles and skillsets and the following soft skills for future job roles are highlighted as essential: the need to be curious, having an experimental attitude, being flexible with good learning skills. Future staff should be multilingual, which means one should understand other disciplines and the language and jargon used whilst also understanding the digital transformation across the fashion value chain. For the near future new roles such as 3D artists – someone who takes the design and make it ready for digital 3D and user centred designers are required.

For a fully successful digital transition, companies need to develop new interdisciplinary cross-industrial collaborations with manufacturers and FE (front-end) software developers. Therefore, one should get stakeholders on board early in the change process and define evaluation criteria for success. In addition, there is the necessity to build a close relation with educational institutions to improve future employment of students.

The digital transformation is a disruptive process and therefore faces many challenges. Companies need to focus on the human factor, do not implement tech just for the sake of it. It is important to build meaningful connections to engage staff. Especially conventionally trained designers must be convinced first of opportunities and benefits of using digital tools when designing. Finally, the digital transition is work in progress: one need to learn to understand what the best practices are, determine new revenue models, registering the timesaving's and new roles and habits needed.

3.4 INTERACTIVE STUDY VISIT DECATHLON/ESTIA

3.4.1 INTRODUCTION

The second interactive study visit was hosted by Decathlon on March 9, 2021. The company was founded in 1976 by Michel Leclercq, a French businessman with a passion for sport. At

first, Decathlon was a retailer of sport products and sportswear. Then, a decade later, the company entered the field of design in response to a bike distributor refusing to supply products and this transformed the company to both sell and to design products. In 1996 Decathlon separated its market in two brands *Quechua* for the mountain related activities and *Tribord* for the water-based activities. While the change came from a marketing perspective, it changed durably how Decathlon design and handle product innovation for a sport practitioner- centric approach. In 2005 came the advent of Decathlon's '2-second pop-up tent' – a tent that can unfold itself, that essentially symbolises the innovation process inside the company.

Following the topics from the focus group held on June 2020 the mobility workshop key areas of exploration were **Sustainability and Circularity** and I**nnovation**.

3.4.2 INTERACTIVE STUDY VISIT

The interactive study visit was held on Microsoft Teams and divided in two parts. The first part was centred around presentations by the Nabaiji Swimming Brand Leader, Aline Gable and its Innovation Manager, Damien Saumureau, who presented an overview, including short video clips, of Decathlon as an international organisation and its user-centric vision. The focus was then centred on Nabaiji, a brand inside Decathlon dedicated to swimming as an 'open ecosystem organisation'. A Q&A session concluded this first part of the workshop. The session centred on 'Sustainability & Innovation' was annotated live on a Miro board (Fig. 20 [below]).
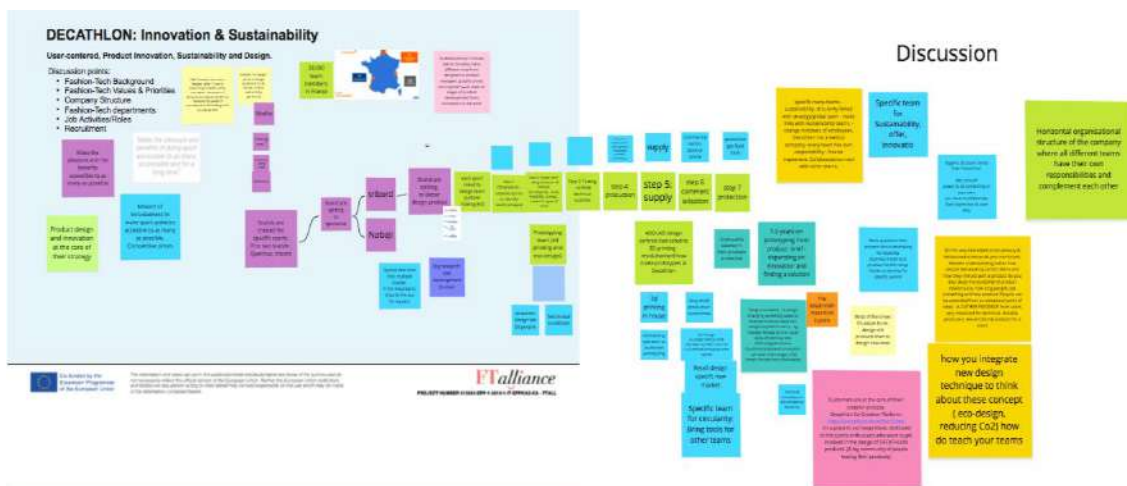

Figure 20. Decathlon Interactive Study Visit: Overview of Miro Board.

After a short break, the second part of the visit was an in-depth presentation of two innovation projects about circularity: the H2020 SCIRT project and a PhD program. This part of the study visit was concluded with a 'free thinking' session around how to prepare students for the Fashion-Tech 'new deal'. Two provocations were offered here which asked: 'what is the new mindset according to new skills?' and 'what kinds of skills can HE offer to transform things/their industry?'

3.4.3 AGENDA

o DECATHLON overview: purpose, vision, user centric organization, design process, innovation and sustainability

o Nabaji, one example of sport brand by DECATHLON, how the "open-ecosystem" make possible to accelerate on innovation and sustainability

- o   Q&A

- o   Circular Loop for swimsuits and the SCIRT Project

- o   PHD to achieve sustainable

The mission of Decathlon is to make sport activities accessible to the masses in terms of performance, quality and price. To 'make the pleasure and the benefits accessible to as many as possible and for a long time' is the company's mission. Decathlon was a reseller at first, becoming a designer in 1989 to respond to sports user needs. Their product innovation is to propose something new based on needs of sport/practice. For example, the easy breath 'full face scuba' for snorkelling (fig. 21).
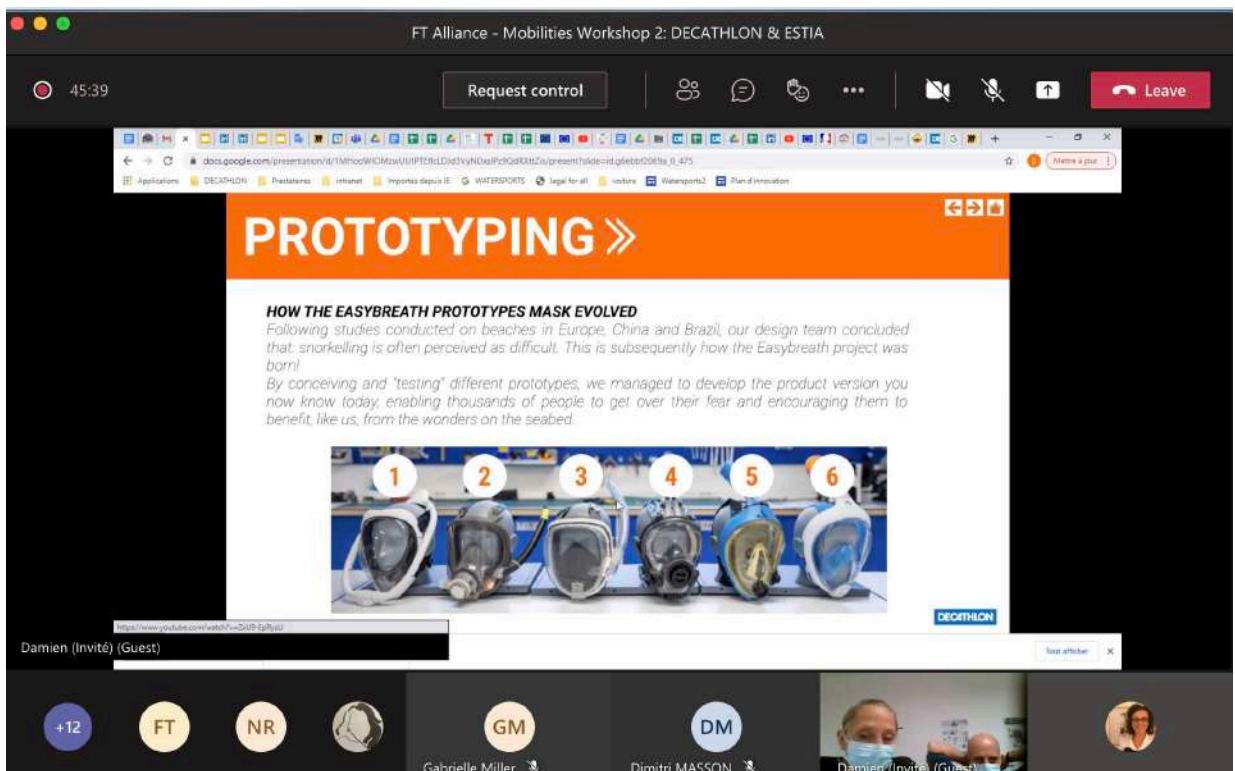

Figure 21. Product Innovation & Prototyping: *EASYBREATHE PROTOTYPE*.

The design mindset that is found in product but also in people working in Decathlon revolves around 4 values:

- •   **Vitality,** sport products are made to improve life, they are about energy and positivity.
- •   **Responsibility** is about taking charge of yourself and being an actor of change.
- •   **Authenticity** is about being truthful with oneself and other, about being simple and useful.
- •   **Generosity** is about doing thing with heart and being turned to other.

About the organisation inside Decathlon

Decathlon in France is a multinational sport brand. The company operates with 23000 team members, 323 stores, 11 Sport sites and services and 14 warehouses. There are several key

features to the company: they are separated by sports, they host brands on special sites (e.g., water sport centre in Hendaye, Pyrénées-Atlantiques, southwestern France).

In 1996, Decathlon separated first into two brands *Quechua* (Mountain) and *Tribord* (Water). Then in 2016, they further divided the brand to have a more user-centric strategy. The brand specialises increasingly by sport (e.g., *Nabaiji* for swimming and *Olaian* for surfing, *Subea* for underwater activities) to meet the requirements of each sport/activity more thoroughly and create better designed products.
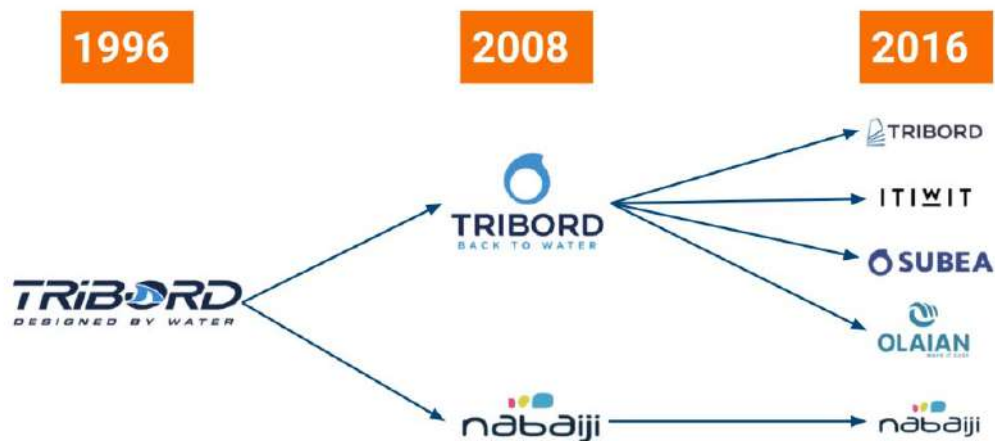

Figure 22. The Decathlon brands.

In each brand there are multi-disciplinary teams in-house to cover all stages of product development from design to the store. These teams include many different roles such as designers, product managers, graphic artists, and engineers. Teams are hosted on sites dedicated to sets of activities located close to the place where athletes practice to facilitate trade and full-scale tests with sport users. For example, *Nabaiji*, and other water activities are hosted in the water sport centre in Hendaye.

Decathlon is not a **vertical company**; it has an **organic structure** where every team has its own responsibility, and is free to implement sustainability, circularity, innovation. Furthermore, each team has the power to implement its own ideas. As Decathlon is a large company, there are many ideas that are developed many times, that are tried across several teams. When an idea or a method becomes mature enough it is communicated internally and then some specific training can be developed accordingly. This is an effective way to develop innovation. However, in the case of fashion-tech the 'new deal', some things move fast, and new ways of discovering new skills, train current teams and recruit young talents emerge in response.

In addition to the internal mechanism of each team there are global traversal teams dedicated to specific subjects: sustainability, processes, testing, prototyping, innovation, offers etc. They have a R&D provision or support roles in other teams:

•   Process teams are specialised on specific processes such as wielding, synthetic fabrics or aqua fabrics. They bring specific expertise to design teams.

•   SPORTSLAB: is an expert centre dedicated to the analysis of the sport practitioner body. More than 50 experts work around 4 areas of expertise: thermal comfort, science of movement, anatomic design, and sensory and behaviour.

- ADDLAB: is a design centre dedicated on 3D printing. Its mission centres on how 3D printing can revolutionize prototyping at Decathlon. 3D printing is done mostly in-house to accelerate prototyping – a prototype product can be produced in a matter of days rather than weeks as can be the case when plans are sent to external suppliers. The increased proximity also facilitates communication and leads to less errors in the fabrication order (size, materials, finishing process). This in turn reduces the cost of prototyping in addition to speeding up the process. The in-house 3D printing has also marginally been used to do some extremely small production.

- Sustainability – Ecodesign and Circularity: all projects from now on must be eco-designed. This also means that before 2026 all current products must decrease their CO_2 footprint by 20% without damaging other aspects. It means research on material, sourcing, and supply chain having a more digital value chain. The circularity teams focus on developing and bringing tools for the other teams. For example, one topic is the technical durability versus emotional durability – some products have a technical durability that extends the time they are used. Questions centre on how to make something 'new' (emotionally speaking) for example to a different customer with something that is not technically new.

About the Ecosystem inside Decathlon:

Ecosystems are groups of teams inside Decathlon that share a common vision. *Nabaiji* is part of the 'move your body into water' ecosystem. The vision is 'I feel as good in the water as in the air, like an amphibian' (see fig. 23). An ecosystem innovates along all the value chain to create exceptional products, from the material to the user and from the user to the material.

Figure 23. *NABAIJI*: Decathlon's in house swimming brand.

This ecosystem is composed of:

Core Specific teams

- Sports teams:

    - diving

    - swimming sports

- Process and Fabric team:

    - Synthetic knit aqua

    - Optics

    - Get Dry

    - Water thermal insulation

    - Synthetic thread

Other internal partners

- Sports lab

- South Aquitaine retail department

External partners

- Estia

- the Chair Bali

- Erasmus+ FT alliance partners

- H2020 SCIRT partners

About the Life cycle of a product

The life cycle of a product at Decathlon takes about 1 year for a textile product and about 1 to 2 years for accessories or plastic product from brief to finished product. The length of the process depends mostly on the kind of innovation involved: design innovation or process and technology innovation. Design innovation relies on known expertise, processes, materials, and technology and is about inventing new functionalities of the product. If new components, processes, or technologies are required to develop the product, the time-to-market become longer. In addition, Decathlon does not own the means of production, and this also implies finding new suppliers or adapting existing one. Redesigning or improving product is also faster and lead to faster innovation.

The life cycle is composed of seven main steps:

1) **Observation**: At Decathlon innovation and product design are user centric. It all starts by watching, listening, and asking practitioners. Sales assistants, product managers, designers and engineers are involved in collecting data around user needs. Recently

practitioners have been increasingly involved with the creation of a co-conception platform.

2) **Design**: Design teams use 2D/3D to materialise the product. Several rounds of prototyping are undertaken in the workshop to validate the different facets of a product, especially for textile products. For instance, the 'Easybreathe' (fig. 22 [above]) took 8 years to develop, had 30 prototypes, 50 people involved, and 50 test protocols were implemented.

3) **Testing**: Early in the design process from the first prototype to later stage development with sports users and experts. Testing helps validate ideas at first and then technical qualities. Sport centers have the material and testing ground to follow validation standards often higher than international and local standards.

4) **Production**: Starts with development where design and process teams collaborate to elaborate the product. Production is then trusted to a panel of a thousand suppliers across forty-five countries.

5) **Supply**: Decathlon controls its own logistic supply chain across fifty warehouses. Automation is beginning to be implemented to facilitates and accelerate that supply chain.

6) **Commercialisation**: Decathlon relies on two channels for selling its product: its own stores and its e-commerce website. The vision is to make the online experience feel as good as in physical stores. Online platforms however open new possibilities: the question about designing for disability was asked during the study visit which is a hard question as the vision for Decathlon is to design for the masses and most disability requires tailoring the product to the user specifics. There is a beginning of a story mostly online here relating to disability, rather than in store currently.

7) **Protection**: The life cycle does not end when the customer buys the product. Feedback from the customers is particularly important to improve products and enable the redesign of products. Feedback is gathered from many sources, including the website, the community created through Decathlon-creation

Next iteration in Sustainability and Circularity with Research projects:

Decathlon has commitment to reduce CO^2 impact by 40% by 2026. The Envisioned strategies to achieve this objective include actions on *transport, suppliers, energy consumption in store* and in *Design.* Regarding design one aspect considered inside *Nabaiji* is the use of sustainable polyester as this material covers 80% of the textile product of the brand. However, the rPET (recycled PET) market is already under tension. *Nabaiji* textile product including swimsuits are easy to dismantle but their fabric, a mix of PET and elastane, might prove difficult to recycle. This led to two objectives for the swimsuit:

• Clean the past: recycle current product in a closed or open loop.

• Invent the future: design an easy to recycle swimsuit.

Participation in European projects comes from the convergence of what *Nabaiji* wanted to do and ideas from an existing consortium.

On the other hand, The *SCIRT* project is an H2020 project regrouping industrial and academic partners with the objective to *reduce the environmental impact of the fashion industry by improving volumes of post-consumer products recycled in textile to closed loop*. The project aims to prototype complete circular loops on 5 distinct kinds of product. Decathlon's swimsuit is one of these case studies (fig. 24).
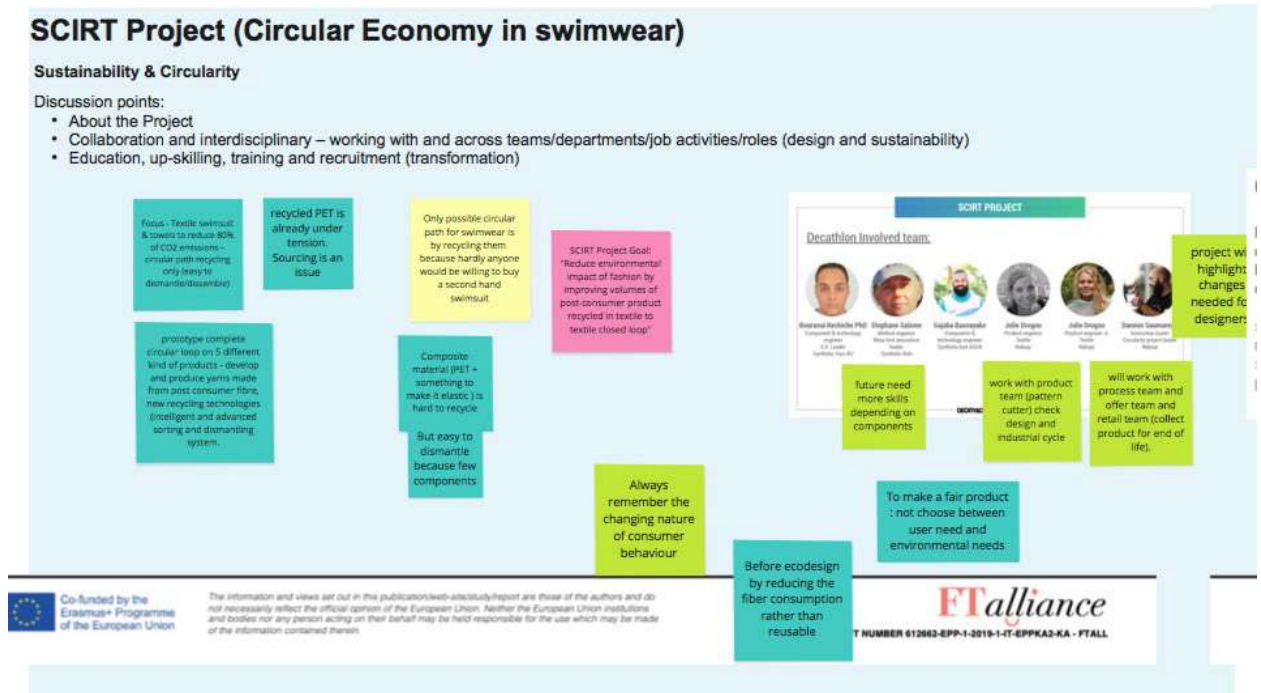

Figure 24. The *SCIRT* project Decathlon.

The ideal scenario would be a full circular swimsuit production. Alternative scenarios include the addition of material from other sources, using the recycled PET from other plastic industry if yarn production is impossible. Or to produce new products with the recycled yarn if the mechanical qualities of the recycled yarn are incompatible with swimsuits.

This test is fully integrated in a user-centred approach, including consumer behavioural research, and a dedicated business model to measure the effectiveness of the approach.

To approach this innovation project the team in Decathlon is multi-disciplinary and is currently composed of:

• A Chemical PhD, specialist in synthetic yarn and component and technology engineer.

• A method engineer, specialist in synthetic knitting.

• A component and technology engineer, specialist in Aqua synthetic knit.

• Two product engineers, with speciality on dismantling the product.

• An Innovation leader specialist in circularity project.

This product-oriented team will work with an offer-oriented team and a user-oriented team to

gather information about current usage and feelings, but also to collect information throughout the project and relating to a change in the usage with the new product.

This kind of research program has really changed the game for Decathlon as usually eco-design is thought out in terms of reducing the impact upward: finding better components, reducing the quantity of material rather than downward by creating a product that can be recycled.

PhD program and the Chair Bali:

Nabaiji works on research projects through the creation of PhDs. A PhD is conducted with the Engineering School at Estia Institute of Technology, France, as part of the Chair Bali program. The Chair Bali regroups multiple brands from the fashion and textile industry around research, innovation, and education initiatives. Each of the industrial partners of the Chair brings a subject that is undertaken as a PhD within the group. This enables collaboration between actors of the industry with rich communication between programs. Furthermore, it fosters innovation across partners and academic. Decathlon's subject is around circularity.

For Decathlon innovation for accessories is quite mastered, but innovation in textile product and around circularity could be improved. Joining a collaborative research program such as the Chair Bali is helping to accelerate Decathlon in this area.

3.4.4 RECOMMENDATION AND INSIGHTS FROM ALL PARTNERS

The Interactive Study Visit concluded with a brainstorming session to gather insights from all participants. Participants were prompted with two questions:

- What does DECATHLON require from Universities and Academics to prepare students for the 'new deal' of Fashion-Tech?

- How can we get training and content programs to transform the skills of our people, according to 'the Fashion-Tech' paradigm needs?

The questions were presented with a Miro board with four quadrants: competences, new roles/skills, interdisciplinary and collaboration, and success, failures, and challenges. In general insights gathered by participants were not all properly classified in the four quadrants, they are reported further below as produced (see fig. 25).
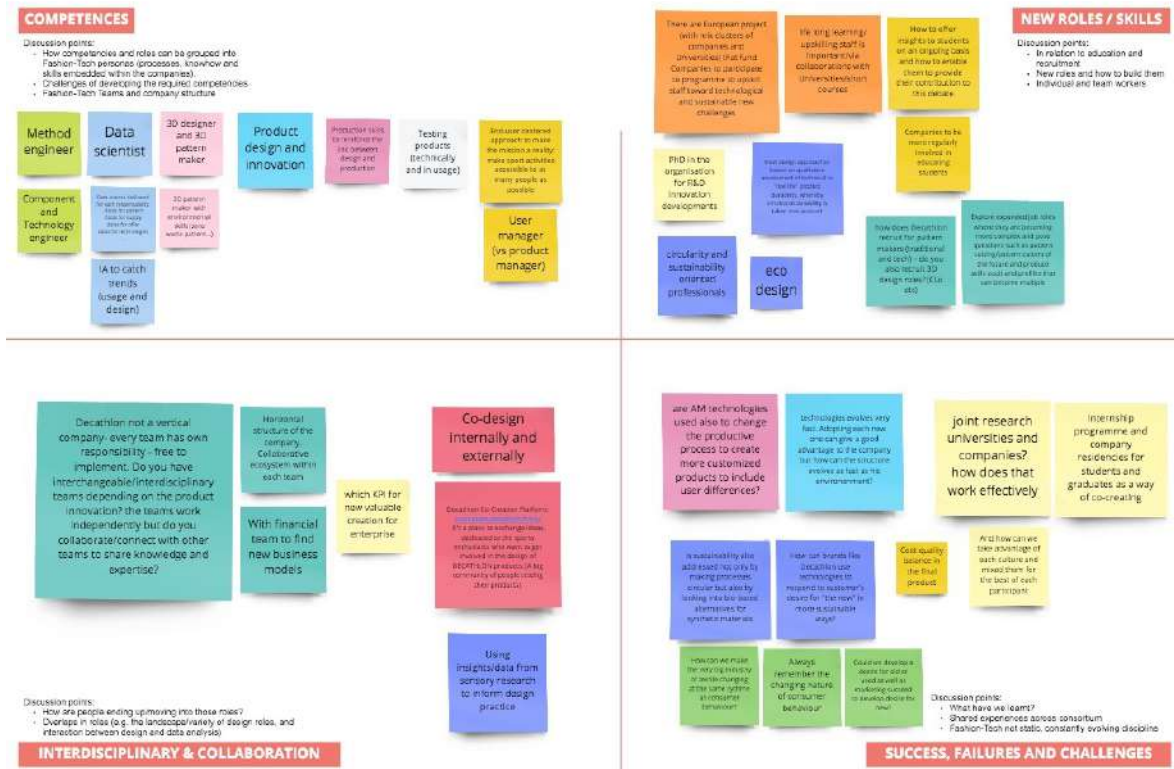
Figure 25. Decathlon: Insights and recommendation from the partners.

New Roles and Skills

In this quadrant participants provided insights about how to relate to education for young talents, recruiting and updating skills of current staff. Actual roles were provided in this quadrant:

- There are European projects (with mixed clusters of companies and universities) that fund companies to participate in programmes to upskill staff for technological and sustainable new challenges; lifelong learning/ upskilling staff via collaborations with universities/short courses.

- How to offer insights to students on an ongoing basis and how to enable them to provide their contribution to this debate.

- Companies to be more regularly involved in educating students.

- Innovative design approaches based on qualitative assessment of technical vs 'real life' product durability; whereby emotional durability is considered.

- PhD in the organisation for R&D innovation developments.

- Explore expanded job roles where they are becoming more complex and pose questions such as pattern cutting/pattern cutters of the future and produce skills audit and profiles that can become multiple.

- How does Decathlon recruit for pattern makers (traditional and tech) – do you also recruit 3D design roles (CLO etc.,)?

- Circularity and sustainability-oriented professionals.

- Eco design.

Competences

In this quadrant insights relates to new job roles:

- Method engineer

- Component and Technology engineers

- Production skills to reinforce the link between design and production

- Data Scientist

- Data science dedicated for each responsibility:

    - data for pattern

    - data for supply

    - data for offer

    - data for technologies

- AI to catch trends (usage and design)

- 3D pattern maker with environmental skills (zero waste pattern...)

- 3D designer and 3D pattern maker

- Product design and innovation

- User manager (vs product manager)

- End-user centred approach to make the mission a reality: make sport activities accessible to as many people as possible

- Testing products (technically and in usage)

Success, Failure, Challenges

In this quadrant questions and insights relates to what was presented in the visit: the 3D printing lab, fast evolution of consumer behaviour, joint program between universities and companies:

- Are Additive Manufacturing technologies used also to change the productive process to

create more customized products to include user differences?

- Technologies evolve extremely fast. Adopting each new one can give a good advantage to the company but how can the structure evolve as fast as his environment?

- Joint research universities and companies? How does that work effectively?

- Internship program and company residencies for students and graduates as a way of co-creating.

- And how can we take advantage of each culture and mixed them for the best of each participant?

- Is sustainability also addressed not only by making processes circular but also by looking into bio-based alternatives for synthetic materials?

- How can brands like Decathlon use technologies to respond to customer's desire for "the new" in more sustainable ways?

- Cost-quality balance in the final product.

- How can we make the noticeably big industry of textile changing at the same Rythm as consumer behaviour?

- Always remember the changing nature of consumer behaviour.

- Could we develop a desire for old or used as well as marketing succeed to develop desire for new?

Interdisciplinary and Collaboration

This quadrant recalls the structure of Decathlon for internal collaboration within teams and external collaboration or co-creation:

- Decathlon is not a vertical company – every team has its own responsibility which they are free to implement. Do you have interchangeable/interdisciplinary teams depending on the product innovation? The teams work independently but do you collaborate/connect with other teams to share knowledge and expertise?

- Co-design internally and externally.

- Horizontal structure of the company needs a collaborative ecosystem within each team.

- Decathlon Co-Creation Platform: It is a place to exchange ideas, dedicated to the sports enthusiasts who want to get involved in the design of DECATHLON products. (A big community of people testing their products): https://cocreation.decathlon.fr/en/

- which KPI for new valuable creation for enterprise?

- With financial team to find new business models.

- Using insights/data from sensory research to inform design practice.

3.5 INTERACTIVE STUDY VISIT PESPOW/HB

3.5.1 INTRODUCTION

Pespow is an international company and leading outerwear business, a creative and technical partner to fashion brands across the globe. For over 30 years, the company has operated alongside its customers, designing, and producing innovative quality sportswear, mixing the traditional artisanal methods with the innovation of materials, process, and techniques. Pespow offer their customers a full service: from the design to the pattern creation and sampling, and through to production. The company has the expertise to perform a wide range of innovative processing techniques, and the R&D department is constantly exploring new opportunities, new fabrics, and new applications to test and experiment. The main goal of the company is to work alongside the costumers to design and manufacture innovative products capable of representing and enhancing the specific identity of each brand. Currently, there are 80 people working in Pespow.

The Mobility study visit by Pespow and HB (with support from UAL) was arranged on March 23, 14.30-17.00 CET. The main organisers/hosts were:

- Cinzia D'Agostino (CEO at Perspow, S.P.A)

- Olga Chkanikova (Lecturer at HB)

- Gabrielle Miller (Lecturer at UAL)

3.5.2 AGENDA

- o *Welcome& introduction – 5 min*

- o *Agenda/focus of mobility visit– 2 min*

- o *Company's presentation – 20 min*

- o *Virtual live tour to show the company – 10 min*

- o *Video interviews (recorded) – 15 min*

- o *Q&A - 20 min*

- o *Break – 10 min*

- o *Special projects: Waste couture & 3D pattern making – 25 min*

- o *Q&A – 15 min*

- o *Miro Board & Conclusions– 20 min*

The key focus was on exploring how Pespow, as a creative outwear engineering company, works with Fashion-Tech innovation, including key processes, competences/skills, collaborations, and major learnings (in terms of success, failures, and challenges). The study

visit provided the perspective of small SME that operates in luxury/couture supply chain. The specific emphasis was placed on exploring Pespow's ways of working and organising with regards to *product innovation and entrepreneurship*, *sustainability & circularity*, *policymaking*. The major questions explored included:

- How is the Fashion-Tech innovation process organised? How do ideas for innovation emerge, spread in the organisation and lead to the implementation of new business practices?

- How does the company work in the value chain/across the product life cycle with the Fashion Tech Innovation?

- How does the company work with policies of their clients/business customers and with policies required at the governmental level, regarding digitalisation, sustainability, and circularity?

- What are the major challenges for sustainable and circular Fashion-Tech Innovations?

- How does the company work in a interdisciplinary way? What are the most challenging aspects when it comes to working in interdisciplinary teams and projects?

3.5.3 INTERACTIVE STUDY VISIT
The interactive study included a variety of materials and online interactive elements, such as:

- A Company presentation by *Cinzia D'Agostino* (CEO), providing a brief company intro, outline of development and production processes, key aspects of business model, pros and cons associated with the Italian context, as well as major challenges, crucial skills, successes & failures, future goals, and aspirations with regards to Fashion-Tech.

- A virtual live tour around the company's facilities, providing insights into areas were outwear collection development and production takes place (e.g., the huge archive with materials and designs used for R&D of collections, proto lab with ultrasonic machine, laser cutting and automatic edge fold-over machinery).

- A recorded video interviews focusing on Fashion-Tech innovation processes, policy-making and interdisciplinary approaches regarding digitalisation, sustainability, and circularity. Interviews were carried out with *Pierantonio Forato* (Founder & Chief for R&D Product Development), *Cinzia D'Agostino* (CEO) and *Enrico Pellizzer* (Product Manager).

- A presentation of special projects: 'Waste Couture' by invited guest speaker *Rossana Diana* (Creative Director at *Waste Couture* /Circular Economy Developer at Web Fashion Academy) and 3D projects at Pespow by *Cinzia D'Agostino* (CEO).

- An interactive Q&A session to allow participants to reflect and further discuss the content of the presentations and recorded interviews.

- A final joint discussion using a Miro board (fig. 26 [below]) to capture major insights from the mobility/Interactive Study Visit and share experience between project partners, with a focus on new competences/skills, new roles, interdisciplinary approaches/ collaborations and successes/failures/challenges regarding Fashion-Tech product &

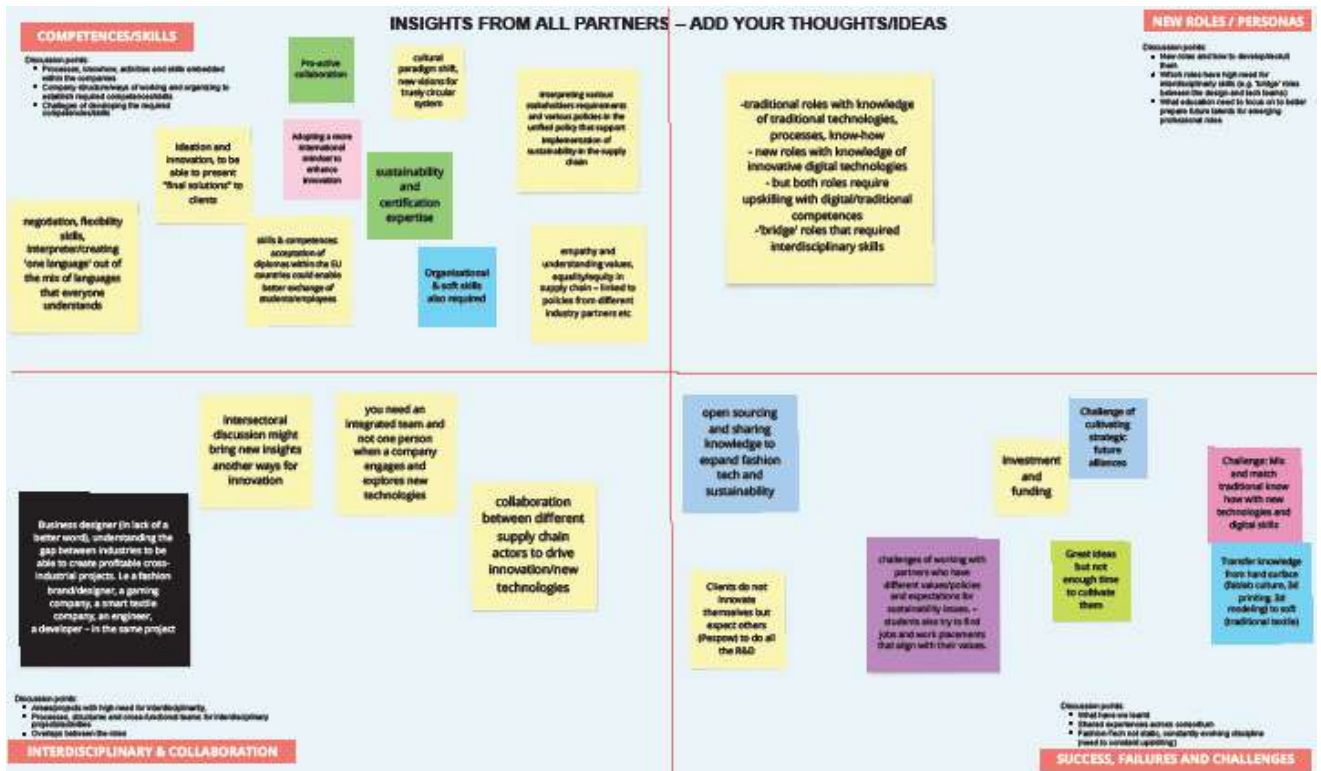process innovations, sustainability & circularity, and policymaking.

Figure 26. Pespow: Insights and recommendation from the partners on Miro Board.

3.5.4 FINDINGS AND FEEDBACK

Background and context: Pespow:

- SME that designs and produces outwear (overly complex products and processes where there is a greater challenge to combine fashion and technology than in other products/processes).

- Manages a supply chain of many small suppliers (challenge of complex Fashion-Tech network).

- Only B2B, does not have own brands, works with leading international luxury brands.

- Operates in Italy (HQ near Venice) with all the pros and cons of the Italian context.

  - Pros: strong technical knowhow, heritage in craftmanship, high quality.

  - Cons: small sizes of the companies, difficulties to invest in new tech, tendency to work alone (challenge to create a strong cultural mindset of working together in the network).

- Manufacturing facilities located in Italy (pattern making and prototyping labs), Rumania and Vietnam.

- Operational practices focus on cross-fertilisation/collaboration and flexibility:

- Focus on cross-fertilization and collaboration with clients and suppliers to deliver innovations in products, materials, styles, and processes.

- Proactive collaborative mindset with strong focus on innovation, quality, ethics, sustainability, expertise.

In terms of innovation and quality specific focus is on:

- ***Mix-and-matching materials*** (a single style may be made up to 150 pieces, including the most diverse fabrics and many accessories).

- ***Special treatments and production processing,*** such as seamless products, ultrasonic sewing, laser cutting, bonding and tech taping, garment dying, 3D modelling etc. (video of proto lab facilities, including ultrasonic machine, laser cut, automatic edge fold-over machinery).

- In the future, they are interested in smart textiles, recognising the need to develop strategic partnership to acquire external expertise in smart textiles research.

- In terms of sustainability Pespow has certified its operations according to the SA8000:2014 /International Standard on Social Responsibility as human resources are viewed as key to building a competitive, financially-sound and socially responsible business.

- Cross-fertilisation is a concept Pespow applies across its operations (e.g., creative residency projects where those from art and technology backgrounds collaborate).

- Key aspects of business model operations include: variety, flexibility, diversity to be able to collaborate and adapt to innovative mindsets to diverse demands of 20 different clients. Focus on flexibility and adaptation to each of the client's specific needs:

> We try to preserve our Italian roots (including expertise) by both adopting an international mindset and retaining our Italian essence when working with our clients. We work as partners to each of our clients and aim to adapt our business model to their specific needs
>
> (Cinzia D'Agostino, CEO)

- R&D activities that lead to decisions about ideas for the outwear collection/s is based on collaboration with clients/leading luxury brands and on Pespow's archive (design ideas and samples from previous collections/projects [see fig. 27]).

- Production processes (fig. 28) are always analysed/feedback collected for continuous improvement & new input for R&D activities.
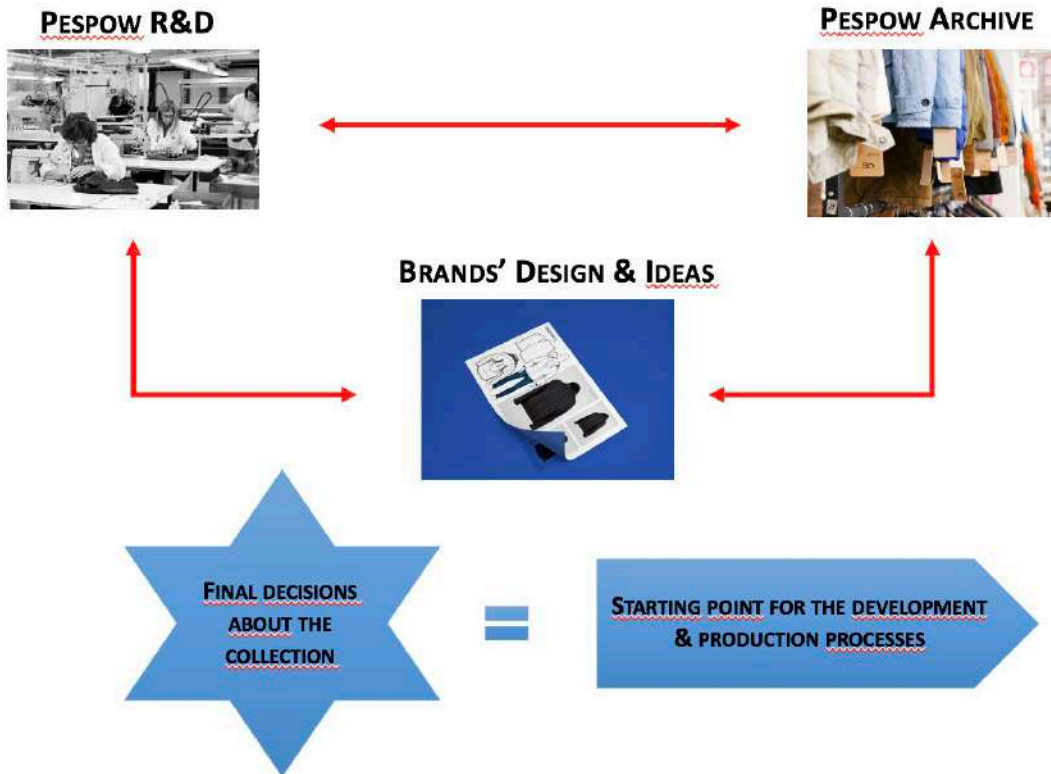
Figure 27. Pespow: R&D process for outwear collection.
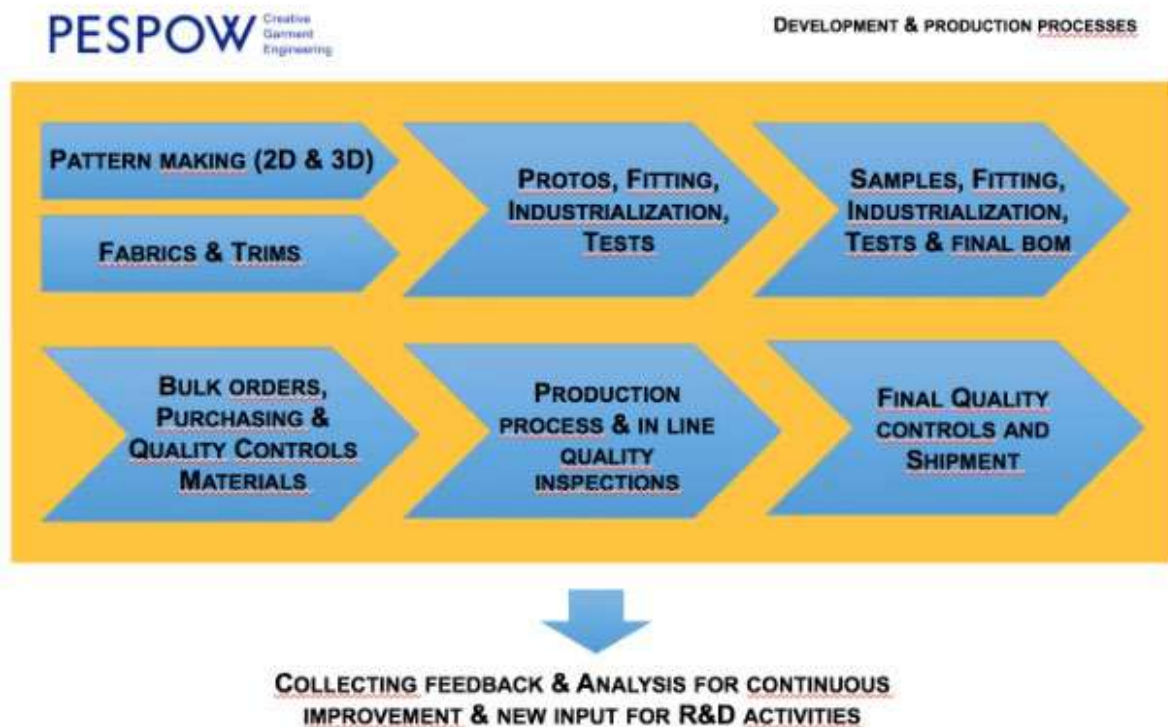

Figure 28. Pespow: Production processes.

Traditional technical skills	Innovative technical skills	Organisational and soft skills
1. Product processing	1. 3D designing& pattern	1. Team working

techniques	making	2. Communication
2. Quality control techniques for production lines	2. New materials and wearable technologies	3. Emotional intelligence
3. Materials and accessories	3. Robotics & Automatization	4. Resilience
4. Technical drawing and 2D pattern making	4. IT & AI skills	5. Flexibility
5. Costing and pricing	5. Data base management	6. Lateral thinking
	6. Certifications	7. Problem solving
		8. International and collaborative mindset
		9. Continuous improvement/personal development
		10. Networking
		11. Project management
		12. Fluency in English

Table 1. Pespow: Crucial skills to support Fashion-Tech Innovation.

Pespow explained it is important not just to have different competences but to combine the right competences together to be able to present the product to the client.

That upskilling of traditional roles is required with innovative technical skills, but also young specialists with knowledge of innovative technology need to know traditional technical skills (e.g., 3D pattern making required knowledge of traditional sewing skills).

Major learnings (success & failures) and future goals:

Success	
1	Purchase PLM System (software) to manage the entire development process & Integrate CAD System with 3D pattern making technology
2	Link up all the systems in the product development department with the systems in prototyping lab and link up software systems with those of clients to ensure fast, safe data transfer
3	Purchase innovative machinery and provide the manufacturers of the machinery with feedback on how to optimise their equipment
4	Develop many new products applying innovative technologies to traditional and/or very delicate materials which many consider impossible to use innovatively
5	Employ the same innovative technologies in our production plants in Italy and Romania
Failures	
1	Great ideas but not sufficient time to explore and embed them
2	Expectation that innovative ideas would come from clients
3	Thinking that clients are always aware of the impact of their policies (need to raise awareness and understanding among clients of policies and certification simply in terms of real implementation in the supply chain)
Future goals and aspirations	

1	Contribute to make the Fashion System truly innovative
2	Invest heavily in technology in Italy & Europe (resource intensity required for Fashion-Tech innovation along with small size of the companies in the supply chain and mindset/culture of working alone creates the challenge for achieving this goal)
3	Working with more innovative technology & modernising our development process (challenge to combine fashion and technology is higher than in other products/processes due to complexity of outwear garments)
4	Complete a culture shift (innovation, digitalisation, international partnerships)
5	Help our network to grow (in size and mindset)
6	Mix & match traditional knowledge with innovative technologies
7	Find strategic alliances to take part in more international R&D projects (e.g., interest to develop partnership for smart textile research) and innovate our technical know how
8	Connect technologies with human capabilities (develop new innovative technology skills, e.g., AI
9	Help clients to understand there are implications of their sustainability policies (complexity of real-life implementation due to diverse policies at various levels, e.g., individual clients, national and international requirements, need for flexibility/adaptation to move forward with sustainability and circularity agenda)

Organisation of Fashion-Tech innovation process:

• Borrowing ideas from completely different fields and using them in innovative way (mix & match traditional expertise with innovative technologies).

• Collaboration with material manufacturer to create new fabrics and innovative automated processes (important to make innovation not 'from zero', but to start with existing materials and innovate with existing materials and new techniques).

• Drawing inspiration from materials in art exhibitions and art installations around the world.

• In most cases Pespow develops innovation in-house in the lab (sometimes the company works with the labs that specialise in certain technologies or treatment processes). Once the innovative product prototype is created, Pespow collaborates with manufacturers who can build innovative machinery for a specific process and finally always purchases this machinery to install in own production facilities.

• Hire consultants to undertake R&D process:

  • collaboration with universities on how to apply the innovative technologies to our fabrics and manufacturing processes, e.g., recent collaboration on how to apply

the water repellent treatment on the final garment instead of fabrics.

- collaboration with Italian company specialising in waste management (development of biodegradable materials) and with Japanese fabric mill to understand the time for materials decomposition, as there is an increasing need to assure clients that we can help them to dispose of the garments in the sustainable way.

Reflections on company's work with policies regarding sustainability and circularity:

- Current challenge of complying with diverse sustainability policies at various levels:

    - Each client has different policies, expecting Pespow to adapt to their specific requirements without showing much flexibility and understanding for the complexity of actual implementation of sustainability policies in supply chain.

    - There is also complexity when it comes to policies at national and international/EU level. These policies are not aligned.

    - Such diversity of sustainability policies at various levels creates confusion and difficulties for Pespow to comply with the single client's policy requirements.

- Competences to deal with a challenge of complying with diverse policies at various levels:

    - Need for awareness and flexibility among clients and policymakers at the governmental level about the complexity of implementing different policies in the actual production system.

    - Need for expertise to understand and deal with diversity of policies requirements and how to translate it in unified approach that meets diversity of clients and policy-makers expectations, as well as how to implement these policies in complex production system and supply networks.

    - Need for commitment of all actors to collaborate (clients, suppliers, policymakers at the governmental level) to help each other to comply with policy expectations.

- Many clients have sustainability policies but few of them think in terms of circular economy and accept the associated costs:

    - There is a big challenge of having lots of materials in stock that do not sell due to current pandemic situation. This is an opportunity to start thinking of the circular approaches.

    - Investments are requiring for sustainability/circularity. Brands asking to implement sustainability policies, but they do not accept the costs. High investments into sustainability vs. low cost for the final product is contradictory.

Reflections on company's approaches to work interdisciplinary:

- Interdisciplinary approach is fundamental to company's both internal and external

operations (i.e., working with different people and teams at client/customer and supplier firms):

- Activities of *Product Manager* include managing people with different skills and mindsets (from pattern makers to product quality technicians, people who work with production, prototyping or buy fabrics).

- The challenge, to work with different competences. It is important not just to have different competences but to combine right competences together to be able to present and deliver the product for the client.

- Clients have different teams, skills, competences (from very specialised to basic ones) and working approaches vary even between different teams at one client.

- In B2B system we are the link between clients and suppliers, as a link we must manage all the difficulties in the relationships between two parties. Finalising negotiations between clients and suppliers is the main challenge.

- Stimulating and challenging aspects of working interdisciplinary:

  - Most effective and innovative ideas emerge from working across different disciplines, when the interdisciplinary work is organised constructively, without one discipline/actor dominating another one.

  - Main challenges are the ability to speak the same language with someone who have distinct set of skills and competences, difficulty to understand each other, taking some things for granted, even dominating over the others, the temptation of one discipline to prevail over the others.

  - In order to bring about innovation there is a need to work together recognising that different parties have equal importance. Even small supplier might have considerable expertise.

Major highlights from presentation of Waste Couture project:

- 'Waste Couture' Production protocol and 'Wastemark' (on product label) that guarantees to consumer that products are designed and produced based on closed-cycle system thinking and 'no wasting' principle. Waste (not just production waste, but the actual unused garments/fabric stocks) are used as resource for creation of new fashion products. Incorporation of innovative technologies, e.g., blockchain and AI, to help with protocol's compliance.

- Pespow explains that collaboration with 'Waste Couture' (external partner) has been launched to explore on the requirements and protocols that should be followed to get implement more circular fashion and obtain 'Wastemark' label.

- To move forward with circular economy/closed-cycle system the need for cultural paradigm shift has been highlighted.

- New visions, creative approaches and new economic foundations that recognise the 'value of waste' and respect the resource regeneration principle were discussed as

issues to be included in the educational curriculum.

Major highlights from presentation of company's work with 3D projects:

- Ongoing work with 3D technologies, including benefits and challenges:

  - A 3D fashion design system (Optitex) introduced in 2016 that completely revolutionised garment design and changed the entire product development process.

  - Many benefits are foreseen from the use of 3D fashion design system, including faster, and cost-effective operations that meet client's needs, and more precision and quality in creating patterns.

  - Designing outerwear garments using 3D technology is still a challenge (significant differences between physical and 3D versions) due to high complexity of outwear garments.

  - The ambition is to integrate 3D technology with manufacturing systems such as pattern mark and cutting systems.

- Completely new roles/integrated teams created to cover the appropriate software and professionals kills for the 3D design process:

  - Technical competences in 2D modelling.

  - Technical competences in products and finishing.

  - Technical competences in 3D modelling.

  - Technical competences in graphics and design.

  - A sense of aesthetics.

  - Experience of fabrics.

  - Technical competences in post-production software.

  - The ability to collaborate with different people and other soft skills, e.g., problem solving, resilience, emotional intelligence, communication, flexibility, lateral thinking.

- In Pespow's experience so far, those most resistant but also those with the greatest interest in working in 3D system are the designers themselves.

  - Short term plans (starting from this year) include:

  - Further developing appropriate software and professional skills for 3D design process.

  - Expanding the team working on 3D modelling to include staff with a broader

range of competencies.

- Considering moving from Optitex to CLO due to better performance.

- Activating a series of strategic alliances for specific projects with some of Pespow's clients and other partners to evaluate the potential of 3D technology in other areas such as production and sales.

- Developing a complete collection digitally and exploring the use of animation.

3.5.5 RECOMMENDATIONS

Building on the summary of participants insights/Miro Board (fig. 26 [above]) and earlier presented findings, the following conclusions/recommendations have been drawn with regards to: new skills/competences; new roles; interdisciplinary working approaches/collaborations; major learnings covering success, failures, and challenges of working with Fashion-Tech innovation.

Competences/skills:

- Preserving *traditional technical skills and expertise*, such as product processing techniques, quality control techniques, materials development, technical drawing and 2D pattern making. Young professionals with more knowledge in innovative techniques, e.g., 3D, need upskilling with traditional technical processing techniques.

- Acquisition of *innovative technical skills*, e.g., 3D designing and pattern making, new wearable technologies, robotics and automatization, AI.

- *Organisational and soft skills* relevant for different roles (both traditional and innovative technologies related, e.g., 3D design process) to enable necessary collaborations and cross-fertilizations for driving Fashion-Tech innovation along with sustainability and circularity improvements. These organizational and soft skills include team working, communication, emotional intelligence, flexibility, lateral thinking, problem solving.

  - Soft skills associated with team working and facilitation of interdisciplinary international collaborations were highlighted as particularly important and challenging given the Italian cultural mindset of working alone.

  - Empathy, flexibility, constructive negotiations, where all actors try to understand each other's perspectives and problems without prevailing of individual interest, were highlighted as particularly relevant soft skills for enabling interdisciplinary work and building strategic alliances for delivering innovative garments collections.

- Expertise to understand and deal with diversity of policies requirements and sustainability certifications, and how to translate it in unified approach that meets diversity of clients and policy-makers expectations, as well as expertise in how to implement these policies and certifications in complex production system and supply networks.

- More focus on circularity approaches and associated expertise is required. To move forward with circular economy/closed-cycle system the need for cultural paradigm shift

has been highlighted. New visions, creative approaches and new economic foundations that recognise the 'value of waste' and respect the resource regeneration principle were discussed as issues to be included in the educational curriculum.

- It is important not just to have different competences but to combine the right competences together to facilitate Fashion-Tech innovation

New roles/personas:

- Both traditional and new technology-oriented roles (e.g., 3D design and AI) require upskilling with traditional/digital competences, as innovation is very much based on mix & match of traditional expertise with innovative technologies.

- Completely new roles are created (not just one) and integrated in teams to cover the appropriate software and professional skills for the 3D design process. Ongoing expansion of the team working on 3D modelling to include staff with a broader range of traditional and innovative technology competences, and soft skills to enable interdisciplinary collaborations.

- So far, those most resistant but also those with the greatest interest in working in 3D system are the designers themselves.

- Based on collected insights it appears that a **'3D fashion design persona'** is emerging that encompasses different roles working in integrated teams to cover appropriate mix of software and professional skills to support 3D fashion design system.

- The **Business Designer** role is acknowledged, characterised by an ability to understand the gaps between the industry and create profitable cross-industrial innovation driving projects (e.g., collaborations between fashion brand/designer, smart textile company, an engineer, and a developer).

Interdisciplinary work/collaborations:

- Collaborations (between different disciplines, sectors, clients, and suppliers) and cross-fertilisation projects are crucial and fundamental for emergence and implementation of Fashion-Tech innovation (covering new materials, processes, machinery):

  - Borrowing ideas from completely different fields and using them in innovative way (mix & match traditional know-how with innovative technologies) to create new fabrics and treatment techniques.

  - Collaborating with manufacturers to develop new machinery for automated production processes. Collaborating with universities and fabric mills to develop new biodegradable materials Necessity to connecting industry point of views into educational programs setting specific small challenges that will improve future employment of students.

- Inspiration for innovation is also drawn from art project and exhibitions (e.g., nurturing creative residency projects where art and technology collaborate).

- New strategic alliances are sought in international R&D project to further enhance

innovation capabilities and strengthen technological know-how (e.g., interest in smart textiles research projects for the future).

- Interdisciplinary approach is fundamental to company's daily operations, both internal and external (i.e., working with different people and teams at client/customer and supplier firms). Most effective and innovative ideas emerge from working across different disciplines, when the interdisciplinary work is organised constructively, without one discipline/actor dominating another one.

Success, failures, and challenges:

- Successful implementation of 3D design system completely revolutionises the design process, allowing faster, resource/cost effective operations that meet client's needs, as well as enable more precision and quality in creating patterns. Implementing product lifecycle management (PLM) software and software to link up the product development processes internally and externally (with clients) allows for faster and safer data transfer.

- Successful collaborations with manufacturers allow to develop and purchase new machinery for automatisation of production processes, including provision of the feedback to machinery manufacturers on how to further optimise it.

- Successful interdisciplinary and cross-sectoral collaborations/partnerships allow for development of new products by applying innovative technologies to traditional and/or very delicate materials which are often considered impossible to use innovatively.

- Failures due to lack of time to cultivate great ideas, expecting innovative ideas to come from the clients/business customers and assuming that clients are always aware of the impact of their policies. (The need to raise awareness and understanding among clients of what policies and certification simply in terms of real implementation in the supply chain, in particular implications with regards to higher products costs).

- Challenge to combine fashion and technology is higher than in other products/processes due to complexity of outwear garments.

- Resource intensity required for Fashion-Tech innovation, along with characteristics of the Italian context, e.g., small size of the companies in the supply chain and mindset/culture of working alone, creates the challenge for achieving the corporate goal of contributing to truly innovative fashion system.

- Challenges of dealing with diverse sustainability policies at various levels, e.g., individual clients, national and international governments' requirements. Multiplicity of policies creates difficulty of implementing sustainability in complex production systems and supply networks (need for collaboration between policymakers for more unified requirements, more flexibility/adaptation to each other's demands and expectations, for helping actual implementation of sustainability policies in the supply chain).

3.6 RECOMMENDATIONS AND CONCLUSIONS TO FEED INTO WP1 - T1.3 AND D1.3

With the 3 interactive study visits hosted by PVH, Decathlon and Pespow, the 3 consortium

partners gave useful insights on how their companies are integrating the disruptive digitalisation of the fashion system in their companies. The conversations and brainstorming sessions held at each meeting with all consortium partners were building on the outcomes of the FGs held in Spring 2020 outlining future job roles, job families and skillsets needed. The conclusions and recommendations highlighted in these study visits, will inform the portfolio with 8 job profiles and guidelines and 4 podcasts with HR addressing selecting and assessing Fashion-Tech talent and future recruitment tools, deliverables for D1.3.

Regarding **competences and skill sets** it was highlighted that preserving *traditional technical skills and expertise*, such as product processing techniques, quality control techniques, materials development, technical drawing and 2D pattern making are still essential. It is important to notice that future young professionals will have more knowledge in innovative techniques, e.g., 3D, but need then upskilling with traditional technical processing techniques. In the near future, the acquisition of *innovative technical skills*, e.g., 3D designing and pattern making, new wearable technologies, robotics and automatisation, AI will be essential. In addition, *organisational and soft skills* both for traditional and innovative technologies related, e.g., 3D design process are essential to enable cross-fertilizations to drive Fashion-Tech innovation along with sustainability and circularity improvements. S*oft skills* associated with team working and facilitation of interdisciplinary international collaborations are important as well as soft skills such as empathy, flexibility, being constructive in negotiations trying to understand and weight different perspectives and problems.

To make a successful digital change **training of all professionals** involved in the supply chain is needed, since the digital transformation requires a paradigm shift where adoption of *new tools and skills* is needed. Developing a digital supply chain makes *collaboration* key across different teams such as pattern cutting, design and 3D development. Building meaningful connections within those teams and within the company is important. A hands on mind-set and ability to translate are essential skills for future designers who need to be able to connect physical and craft knowledge of textiles and garments with digital. A positive result of a digital supply chain is that it brings back collaboration of different teams across pattern cutting, design and 3D development with a renewed focus on craft and design.

The *role* of **an innovation manager** who can bridge and oversee all competences, whilst building meaningful connections amongst staff understanding how to get them on board and changing their mind-sets is fundamental. In addition, the role of translator as a **business innovation manager** is key. Someone who can build the bridge between all competences and put that into a new business model or revenue stream, as in, a product, a service, turning a smart idea into a scalable business. To enable start-ups to be successful within a company an innovation manager is required with a deep understanding of the business process to be able to endorse the change not knowing where it lands.

Some European funding schemes invite Universities and Companies to collaborate and develop educational programs to upskill and staff in Fashion-Tech and sustainability. For the future long-term collaborations among companies and universities are important to ensure staff and students knowledge around sustainability and latest digital developments stays up to date, since more fundamental changes are foreseen. Lifelong learning *and training via short courses* (delivered by universities) or internal training will be key. Universities and companies need to work together to optimize the education of young talent, the recruitment processes and offering the right training for current staff.

One of the big problems is the diversity in **sustainable policies** requirements and certifications.

Therefore, specific expertise is needed to understand and translate these different policies in a unified approach that meets diversity of clients and policy-makers expectations, to implement these policies and certifications successful in the complex production system and supply networks. In addition, more focus, particular in education, on circularity approaches and a circular economy/closed-cycle system, which will cause a paradigm shift, is required. This is involving new visions, creative approaches and new business models that recognise the 'value of waste' and respect the resource regeneration principles. Finally, a deep understanding of different (sustainable) policies and certifications and a further streamlining of these is required before an integral implementation in the supply chain can take place and the implications to higher products costs.

The implementation of 3D design system is completely revolutionising the design process, allowing faster, resource/cost effective operations that meet customers' needs, as well as enable more precision and quality in creating patterns. Implementing product lifecycle management (PLM) software and software to link up the product development processes internally and externally (with clients) allows for faster and safer data transfer. To increase the change a collaboration across a wider range of disciplines with an **interdisciplinary approach** is fundamental to company's daily operations, both internal and external (i.e., working with different people and teams at client/customer and supplier firms). Innovative solutions emerge from working across different disciplines when the interdisciplinary work is organised constructively. In addition, collaboration outside the company with different disciplines, sectors, clients, and suppliers) is essential to integrate ideas from completely different fields such as gaming but also to explore new materials, processes, manufacturing processes and machinery.

A mix & match of traditional expertise with innovative technologies and cross-disciplinary know how will enable the creation of new fabrics, treatments, and techniques. Collaborations with manufacturers is required to develop new machinery for automated production processes. Lastly, joint research with universities and companies in R&D, which is not current practice, is important for future innovations especially around smart textiles, biodegradable materials. Internship programs and company residencies for students and graduates might be useful for co-creating and co-exploring these new directions.

The digital transformation is a disruptive process and therefore faces many **challenges**. Companies need to focus on the human factor, do not implement technology just for the sake of it. It is important to build meaningful connections to engage staff. Especially conventionally trained designers who must be convinced first of opportunities and benefits of using digital tools when designing. Finally, the digital transition is a work in progress: one needs to learn to understand what the best practices are, the new revenue models, the timesavings and new roles and habits needed.

4. PORTFOLIOS

4.1 INTRODUCTION

There are 12 digital portfolios featured on the FT alliance website. These provide a means to celebrate and disseminate publicly, the work of 7 Industry and 5 HEI consortium partners (listed below) in the field of Fashion-Tech.

INDUSTRY PARTNERS

SMEs representing the Fashion-Tech ecosystem that presented their online digital portfolio are:

- PESPOW Creative Garment Engineering, Italy

- Pauline van Dongen, The Netherlands

- STENTLE, Italy

- We Love You, Sweden

- Grado Zero Innovation, Italy

Fashion and Apparel Large Enterprise:

- Decathlon, France

Research Technology Organisation:

- Centexbel

HEI PARTNERS

- POLIMI -Politecnico di Milano - School of Design, Italy;

- ESTIA- École Supérieure Des Technologies Industrielles Avancées, France;

- HB - Högskolan I Borås, Sweden;

- UAL – LCF - University of the Arts London - London College of Fashion, United Kingdom;

- TUD - Technische Universiteit Delft, The Netherland

Since the mobilities visit had to be modified into virtual mobilities visits (see: 4.2.1 'Covid-19 Modifications' below) it was decided the 12 partner portfolios should be completed by the individual partners themselves. Furthermore, that they should try to include visual attractive footage of labs and company space followed by text highlighting the most relevant information about the company Fashion-Tech approach, structures, values.

4.2 METHODOLOGY

The aim of the portfolios is to represent the Fashion-Tech narratives of each of the FTalliance partners (HEIs and companies [micro, medium, and large]) in a highly visual, succinct, and accessible format for visitors to the website. Moreover, it offered the partners an opportunity to consolidate what they do currently in a collective portfolio series that integrates industry and educational knowledge and speaks of the richness of our combined and varied activities and how each is adapting in the fast-moving fashion-tech landscape.

As a means of structuring the portfolios and a framework, each Industry partner was asked to form their portfolio response and visual content around the 5 headings they had previously addressed in the questionnaire:

- Fashion-Tech Background

- Fashion-Tech Values & Priorities

- Company Structure

- Fashion-Tech departments

- Job Activities/Roles

Thus, the secondary purpose of the questionnaire was to help guide each FTalliance Industry partner to unpack what information needed to be presented as part of their own individual Fashion-Tech Partner Portfolio to be presented on the FTalliance website. By following these headings, we were able to ensure the capture and visualisation of all required data for the project deliverables.

Furthermore, this allowed for the content to be curated in a format specific to the needs of the FTalliance project and its dedicated website. Beyond the specification to organise materials in this categorical way, we remained open and flexible to allow the diversity of each company to be imparted, and for their portfolios each to have their own style/company aesthetic. This approach not only allowed a celebration of points of difference amongst partners but also considered a more varied and stimulating experience for visitors to the website.

Figure 29. Pespow Portfolio: Prototyping lab for creative garment engineering.

Figure 30. Stentle Portfolio: Omnichannel retail and brainstorming new solutions.

The HEI partners were not required to respond in the same way but more to highlight specifically the varied ways their institutions engaged with Fashion-Tech in the curriculum, through R&D, and knowledge exchange activity with external partners.

All partners (Industry and HEI) were asked to submit their information in the following format: a short introductory film (circa 5-8 minutes), apart from We Love You where the introduction to the company is in the form of a short podcast; a series of between 10 and 20 images with image captions; an explanatory text with hyperlinks and a power point presentation. The use of key words to help navigate content was encouraged and the inclusion of visuals and moving image featuring R&D spaces/laboratories, equipment, technologies, software, materials, prototyping, product and showcasing to inform the website target audience (students, tutors, HEI Careers Services) of an HEI or company's breadth of activities related to fashion-tech. Partners at Estia Institute of Technology, responsible for the collating and uploading of materials to the website, offered guidance on image size, length of film, contextualization of materials, power point format (16:9) etc. They worked closely with UAL-LCF to support Industry and HEIs throughout the process of portfolio preparation, advising and remaining sensitive to the use of certain materials, to ensure completion of this public-facing deliverable.

To further consolidate things and render them a cohesive part of the FTalliance project, videos were prefixed with an FT alliance teaser film/animation created by Polimi and a final project
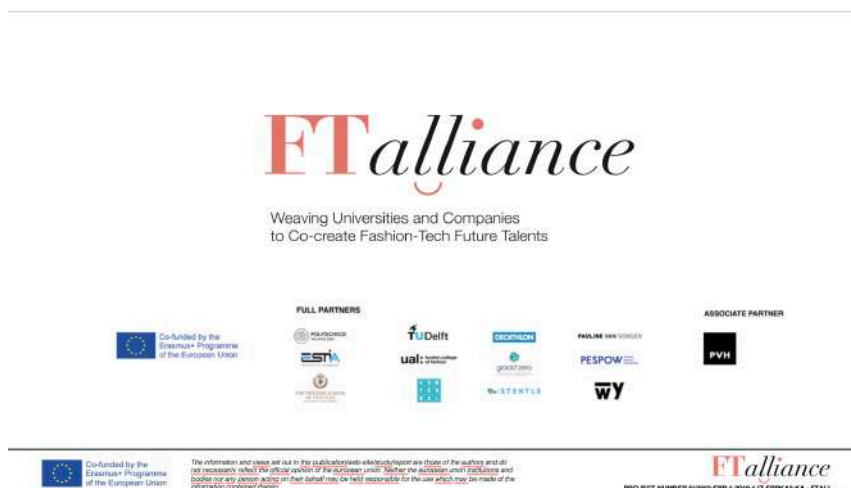
branded slide was added to the end of each film. All films now feature on a dedicated FT alliance Project YouTube channel.
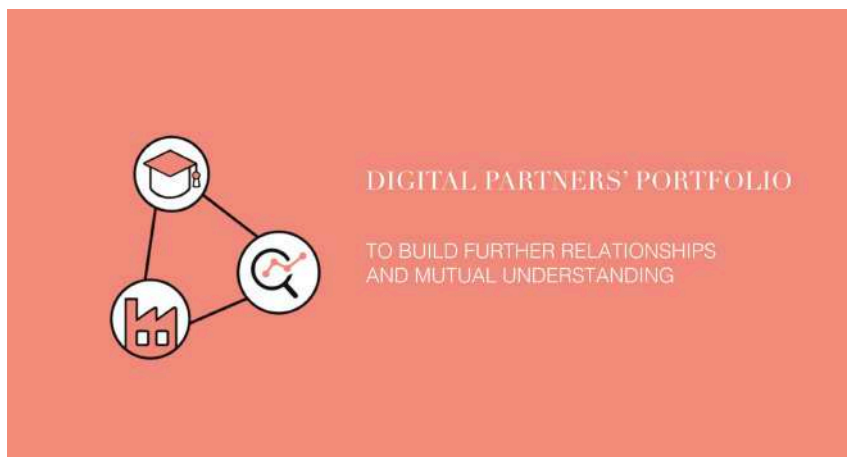
Figures 31-33. Image stills from the FTalliance teaser animation.

Figures 34. Final FTalliance project branded slide all partners' introductory films.

4.2.1 COVID-19 MODIFICATIONS

As previously stated in this report, all activity related to staff mobilities and the gathering of insights from industry partners became digital due to travel and other restrictions imposed by Governments because of the Covid-19 pandemic. This included the partner portfolios which formed one aspect of the implemented digital solution for Fashion-Tech knowledge exchange between partners. The above methodology describes the approach we took and the tools and techniques we utilised to achieve the digital portfolio outcomes.

4.3 PORTFOLIO'S LINKS

4.3.1 INDUSTRY PARTNERS

- Centexbel: https://fashiontechalliance.eu/en/centexbel

- Pespow: https://fashiontechalliance.eu/en/pespow

- Pauline van Dongen: https://fashiontechalliance.eu/en/pauline-van-dongen-digital-portfolio

- Stentle: https://fashiontechalliance.eu/en/stentle-digital-portfolio

- We Love You: https://fashiontechalliance.eu/en/we-love-you

- Decathlon: https://fashiontechalliance.eu/en/decathlon-digital-portfolio

- Grado Zero: https://fashiontechalliance.eu/en/grado-zero-digital-portfolio

4.3.2 HEI PARTNERS

- TUD: https://fashiontechalliance.eu/en/tu-delft-digital-portfolio

- ESTIA: https://fashiontechalliance.eu/en/estia-digital-portfolio

- POLIMI; https://fashiontechalliance.eu/en/polimi-partner-portfolio

- UAL - LCF: https://fashiontechalliance.eu/en/ual-lcf-digital-portfolio

- HB: https://fashiontechalliance.eu/en/university-of-boras

4.4 CONCLUSION

As stated above, the 12 partner portfolios were developed by each partner as a digital output and visual, Covid-safe alternative, and addition to the virtual mobilities. As a key part of our mission to boost the digital transformation of both the fashion and education sectors, and with their attractive images and footage of company space, the portfolios represent a rich visually oriented solution to providing further insights into the current and varied work of our Industry and HEI partners. Furthermore, they are an efficient way of imparting knowledge succinctly about a company's fashion-tech approach and values since their aim is to highlight the most relevant information extracted from the more in-depth questionnaire data and interactive study visit findings.

The findings and recommendations from these exercises have been captured in chapter 2 and chapter 3 of this report. The overall conclusions from the mobilities that feed in to D1.3 are to be found in chapter 3, section 3.6.

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