



Advancing industrial digital and green innovations  
in the advanced textile industry through innovation  
in learning and training

## **WP2 Irish National Report**



Co-funded by  
the European Union

Project acronym:	ADDTEX
Project full title:	Advancing industrial digital and green innovations in the advanced textile industry through innovation in learning and training
Grant agreement no.:	101056303 — ADDTEX — ERASMUS-EDU-2021-PI-ALL-INNO
Responsible partner for deliverable:	CITEVE & TUS
Contributing partners:	All partners
Author(s):	CITEVE & TUS
Target Group(s):	Institution
Distribution level:	Public
Total number of pages:	11
Version:	Final
Language	English
Reviewed by:	Peer review
Status:	Final
Delivery date:	07.12.2022

Version control:

Number	Date	Description
1	29.11.2022	Draft
2	07.12.2022	Final

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor the granting authority can be held responsible for them.”

## Contents

Contents .....	3
1. Introduction .....	4
2. Technologies / innovation /documents /tools.....	5
2.1.1 Green transition.....	<b>¡Error! Marcador no definido.</b>
2.1.2 Digital transition .....	7
2.1.3 Smart transition .....	8
3. Existing Initiatives (Projects/strategies/documents/tools).....	10
4. Impact of the Green, Digital and Smart processes in the industry .....	14
4.1.1 Green .....	16
4.1.2 Digital.....	17
4.1.3 Smart.....	17
5. Initial and further education on advanced textiles .....	18
6. Conclusions .....	20



## 1. Introduction

The Addtex project with respect to the Irish textile industry has been undertaken by researchers from TUS, the IDEAM Cluster and Limerick School of Art & Design. Participating companies, VET and HEIs span the island of Ireland and includes manufacturers of woven textiles, knitted textiles, woollen carpet producers, along with individuals representing wool and fibre growers and textile upcycling facilities in Ireland.

For the purpose of this report the methodologies and activities implemented included desk-based research into indigenous textile companies and manufacturers. This was followed by face-to-face meetings involving workshop and living lab where the project objectives were presented and the key focus areas of WP2 were outlined. Information linked to green, digital and smart technologies were provided and the participants were invited to respond in groups and share their insights relating to current challenges and recognition of opportunities for the sector. Follow-up meetings with smaller groups online and a short survey was circulated.

The meetings took place in November and December. It is worth noting that the majority of these companies create commercial products for the Autumn/Winter and Christmas gifting season and that this is a very busy period to engage with businesses of this nature for the purposes of research.

The participating companies are listed in order of process, from wool producers to post textile product production waste facility;

Wool producers- Galway Wool Co-op

Spinning- Donegal Yarns, Olann

Woven Textiles- Magee 1866, McNutt, Studio Donegal, Mourne Textiles, Foxford, John Hanly Woollen Mills, Cushendale, Molloy & Sons

Knitted Textiles- Irelands Eye, Aran Woollen Mills, McConnell Woollen Mills

Carpet Makers- Connemara Carpets, Ceadogan Rugs

Textile Upcycling- Cirtex

The following chapters will outline how the research was conducted, addressing the key areas of green, digital and smart innovations and the challenges impacting the textile industry around the island of Ireland. Identifying existing initiatives, planned government provisions and reports has been carried out through desk-based research, and presents an overview of the current landscape supporting green, digital and smart transitions on the island of Ireland.

Innovation in relation to green, digital and smart processes will be documented, establishing what currently impacts on these processes and presents challenges. Based on these challenges identified and the needs

assessment, opportunities and recommendations for positive impact will be outlined. These will be proposed as Priority Training Topics, resulting from the Living Lab.

The education and training mechanisms that currently exist in support of the textile industry will be listed and delineated in respect to design driven pathways and skill-based learning programmes.

The conclusion of this report will consolidate the findings and summarise the national report.

## 2. Technologies / innovation /documents /tools

The research was conducted through

- desk-based research
- face-to-face and hybrid meetings
- virtual online meetings
- site visits to industry partners

The research conducted was to ascertain challenges and opportunities facing the textile industry across the island of Ireland. Workshops where stakeholders gathered to discuss key challenges facing the industry in the areas of green, digital and smart transitions were organised and facilitated by TUS researchers. From the data gathered there emerged a number of challenges that unify the cluster.

It is worth mentioning that the textile companies partaking in these activities range in scale and outputs. There was an additional workshop hosted by the IDEAM cluster where industry members came together in person to identify strategic challenges and opportunities.

A number of participating companies operate at scale and rely on computer aided manufacturing and digital systems and a sizable number of employees. Participants also included businesses which operate on a much smaller scale with a focus on low footprint, traditionally crafted artisanal products and are not heavily reliant on digital or smart technologies for their day-to-day operations. This poses a challenge when looking to address the collective challenges of the cluster as different companies present with different challenges, however there were areas were common concerns aligned. These are expanded on in the table below.

The process has engaged Addtex partners at monthly review meetings to monitor and measure progress, ensuring criteria for this report are met.

Table 1. Green

Technology/innovation/ Changes	Description	Processes impacted by the technology	Examples (links..)
-----------------------------------	-------------	---	--------------------

<p>Upcycled Products &amp; Insulation using by product from the textile industry</p>	<p>A pilot creating new mattress and insulation components led by Cirtex is currently working with the cluster to incorporate wool textile by product into its shredding and upcycling process.</p>	<p>Currently companies manage waste independently through municipal waste collections or donations to schools. Companies also export selvedge for processing and this must be pressed and packed using specialist machinery off site. Implementation of circular design methods focusing on up-cycled insulation offer solutions for domestic waste.</p>	<p><a href="#">Cirtex LTD Upcycled Insulation &amp; Textile products</a></p>
<p>Skills preservation and retention</p>	<p>A product of design led programmes in the areas of fashion and textiles means that graduates are not equipped with the necessary skills for direct entry into the textile industry. There is also a tendency for graduates to leave Ireland for opportunities abroad.</p>	<p>Currently a number of companies rely on skilled individuals who are approaching retirement age. Other companies look to recruit employees internationally.</p>	<p><a href="#">First Certified Weaving Course in Ireland Launched – Donegal ETB</a></p>
<p>Fibre blending technology</p>	<p>When used in combination with finer and soft wool, Galway wool makes an ideal fibre for both outer and inner worn garments.</p> <p>The staples are long enough for Worsted Spinning, giving good stitch definition and making it an ideal yarn for textured knits such as Aran.</p> <p>Fibreshed Ireland is launching Climate Beneficial™ fibres to build on quality assurances for Irish fibres.</p>	<p>Working with Irish wool producers to scale the use of native wool in Ireland. Challenges lie in the lack of wool scouring and processing facilities in Ireland and extensive fibre knowledge linked to the grading and quality assurances around the product as raw material. Education focused on wool grading, fibre composition, compatability and alternative uses involving the farming community, educational and creative sectors.</p>	<p><a href="#">Galway Wool - Donegal Yarns</a></p> <p><a href="#">Fibreshed Ireland - Fibreshed</a></p> <p><a href="#">Climate Beneficial™ Wool - Fibreshed</a></p>

## 2.1.1 Digital transition

Table 2. Digital

Technology/innovation/Changes	Description	Processes impacted by the technology	Examples (links..)
Cyber Security	Threat of data breaches and fraudulent activity impacting on business and consumer confidence.	Client and consumer confidence reinforced. GDPR Secure Data In-house operations efficiency	<a href="https://www.gov.ie">gov.ie</a> - <a href="https://www.gov.ie">Communications and Digital (www.gov.ie)</a>  <a href="#">Stripe Radar: Fraud Prevention for Credit Cards &amp; Payments</a>
Databases	Databases supporting recruitment, in-house operations, servicing and maintenance, suppliers and supply chain.	Transferable skills exist across industry partners, opportunities exist to create recruitment database to support industries struggling to recruit skilled employees. HR as a service.  Operations would benefit from increased access to skilled servicing and maintenance support through connected and shared systems.  Supply chain TMS software is a UK based firm provided supply chain support for companies which a number of the companies hold licenses to.	<a href="#">TMS Software Ltd - Flexible software created for the textile industry (tms-software.co.uk)</a>

<p>Digital systems and software and machine operations.</p>	<p>Supporting knowledge of digital systems and software and machine operations is of interest to companies when engaging new employees, but also key to supporting staff in existing roles.</p>	<p>Companies experience inefficiencies in these areas due to software updates, machine or software obsolescence and compatibility across areas connected to supply chain, design &amp; production.</p> <p>There are a number of companies that facilitate online training in specialist tools and software.</p>	
---	---	---	--

### 2.1.2 Smart transition

Table 3. Smart

Technology/innovation/Changes	Description	Processes impacted by the technology	Examples (links..)
<p>Smart authentication methods</p> <p>Anti-counterfeiting tags</p> <p>Protected IP- Donegal Tweed, Irish Linen and Aran Knitwear Certification</p>	<p>Smart authentication methods to validate IP and certification for clients and customers supporting transparency, traceability and bolstering consumer trust.</p>	<p><i>On 13 April 2022, the Commission published the very first framework to protect the intellectual property of craft and industrial products that rely on the originality and authenticity of traditional practices from their regions.</i></p> <p>This framework will cover regional textiles such as Donegal Tweed and is similar to the protection offered to Champagne under their “Protected Geographical indication” (PGI) status.</p>	<p><a href="#">Digital Identity and Garment Journey – Gabriela Hearst</a></p> <p><a href="#">Parliamentary question   Protection of EU craft and industrial products in the European Union   E-002169/2022   European Parliament (europa.eu)</a></p> <p><a href="#">European Commission Proposes Protected Status for Donegal Tweed – 1866 Life (magee1866.com)</a></p> <p><a href="#">DI-11 Researcher: Development of chemical anti-counterfeiting tags for the protection of cultural... Tyndall National Institute, Ireland   scholarshipdb.net</a></p>
<p>Smart Passive Textiles- Hemp &amp; Flax Biocomposites</p>	<p>The mechanical properties of flax and hemp fibres offer a range of opportunities in the</p>	<p>The FUSION project, currently underway will facilitate new product development and</p>	<p>Donegal Yarns Intertrade Ireland-</p>



	<p>automotive and aerospace. They are comparable to those of glass-fibres, offering a lightness, low density and flexibility. Developments present proven applications and suitability for biocomposites and laminates supporting PVC, PE and PP polymers and replacing traditional synthetics. Both hemp and flax can be applied to complex forms and structures by extrusion, injection moulding and lamination</p>	<p>processes namely the development of new yarns from a combination of natural materials including sustainable fibres such as hemp.</p>	<p>Hemp Bio composites Ulster University <a href="#">Innovation Boost   InterTradeIreland</a>  <a href="#">TITLE (ulster.ac.uk)</a>  <a href="#">Polymer Processing – Inspiration Station (tus.ie)</a></p>
SaaS systems	Software as service	Tailr is an innovative cloud-based SaaS platform that helps clothing brands streamline production, achieve sustainability goals, & ensure consistent sizing from season to season that has the potential support Irish and international markets	<a href="#">Tailr - Redefining production for the clothing industry</a>

### 3. Existing Initiatives (Projects/strategies/documents/tools)

- Identification of projects and documents at national and regional level with a focus on the advanced materials targeted on green, smart, digital knowledge and impact of COVID 19 on the adoption of new working methodologies in the Advanced Textiles industry.

[Nature-and-Extent-of-Post-Consumer-Textiles-in-Ireland---Study-Report.pdf \(epa.ie\)](#)

The Nature and Extent of Post Consumer Textiles in Ireland study was commissioned by the Environmental Protection Agency to determine the nature and extent of the current consumption of new textiles and generation of post-consumer textiles in Ireland and reviews the current systems used to collect textiles for reuse, recycling and disposal. The report makes recommendations to improve separate collection of post-consumer textiles, to facilitate and encourage more reuse within Ireland, to foster more repair of textiles, and to take longer-term steps towards more sustainable consumption and use of textiles. The volume of post-consumer textiles waste in Ireland is estimated to be 35 kg per person per year which is higher than the reported EU average of 26 kg per person per year. The report has found that approximately 9%, equating to about 15,000 tonnes per year of total post-consumer textiles in Ireland are processed for rag or fibres by-product to be used for product such as insulation or mattresses. The study suggests that in order to improve and facilitate better textile waste practices, more data needs to be accessible to map the journey and use of post-consumer textiles. Educational campaigns are necessary to raise awareness and the public's perception of post-consumer waste needs to be considered. Local pilot projects are recommended to seek out regional, as well as national solutions.

[Circular Fashion & Textiles Good Practice Sectoral Guide - \(circuleire.ie\)](#)

CIRCULÉIRE has developed the Fashion and Textiles Good Practice Sectoral Guide intending it to be a point of reference and strategic guide for the textile industry, apparel and clothing production facilities, textile recycling facilities and importantly extending guidance to stakeholders integral to the value chain, consumers, retailers and policy makers.

The guide:

- *Provides industry stakeholders with an overview of industry-led circular innovations that are shaping the fashion and textiles sector domestically and in other parts of the world.*
- *Profiles 12 circular innovations, which range in maturity and technological readiness level from earlier-stage solutions, and more mature, market-ready and fully commercialised circular innovations.*
- *Highlights the opportunities to circularise textiles value chains in Ireland.*

Wool Feasibility Study

[228775\\_bfd187ee-8ea3-40a0-9e6b-d99da3b57147 \(2\).pdf](#)

This review published in July 2022 assessed market opportunities for Irish wool. This study was commissioned by the state, in large part due to the substantially low return on wool stocks in recent years. Several market sectors were assessed. Barriers to advancements and meaningful establishment in identified markets are outlined, along with recommendations for the routes to accessing these markets.

The recommendations include, but are by no means limited to; **branding of Irish wool, establishing a wool hub, establishing an innovation cluster, Life Cycle Assessment frameworks, subsidised apprenticeships for wool sector, expansion in genetics and breeding databases, wool fibre applications, RD&I support.**

WP2. [Irish National Report]

Page 10

D2.1. Gap analysis report including national and EU reports

© 2023 by [ADDTEX Partnership](#) is licensed under [Attribution-NonCommercial-ShareAlike 4.0 International](#)



## Projects – IDEAM

DI4TEX is an Erasmus+ partnership and brings together 4 institutions from Ireland, Spain and Slovenia, with expertise in the areas of textile and digital innovations. The aim of the project is to hone in on the digital needs experienced by the advanced textile sector and develop a sector specific, virtual training programme. This programme will serve employees in the advanced textile sector, increasing capacity for knowledge transfer and building confidence in the implementation of the digital transformation within their organisations.

Harnessing Digital The Digital Ireland Framework 2022 Progress Report-  
[gov.ie](http://www.gov.ie) - [Harnessing Digital - The Digital Ireland Framework \(www.gov.ie\)](http://www.gov.ie)

This report sets out a series of targets including Digital Transformation of Business, Digital Infrastructure, Skills, Public Services and seeks to foster a coordinated approach to digital policy & regulation. The objectives of the framework are enable the digital transition across the economy and society and extend to the considered well-being of Irish citizens, the efficiency of public services upon which they rely and in relation to enterprise and innovation there is a key focus on the productivity, competitiveness, agility and the sustainability of our economy and its potential for positive digital transformation.

The report recognises that Ireland has a strategic advantage given the number of burgeoning technology companies that do not exist in isolation but have the support of academic institutions and researcher aligning their programs and practices around the industries needs. This ecosystem provides a platform for growth and opportunity in the digital sector.

Figure 1: Digital Transformation of Business, Dimension 1 Overall Targets

- Enterprise take-up of 75% in Cloud Computing, Big Data, AI by 2030
- 90% of SMEs at Basic Digital Intensity level by 2030
- At least 800 businesses supported by 2026 under the €85 million Digital Transition Fund to support businesses to digitalise
- At least 35% of State funding for start-up and early stage businesses to be invested in innovative digital businesses from 2022.

National Recovery and Resilience Plan

[gov.ie](http://www.gov.ie) - [The National Recovery and Resilience Plan \(www.gov.ie\)](http://www.gov.ie)

Priority 2: Accelerating and Expanding Digital Reforms and Transformation

As the country continues to recover from COVID-19 certain mechanisms have established themselves as what is termed the 'new normal' this extends to remote working, remote transferal of confidential information. These modes of communication have seen a marked decrease in in-person client meetings, consultations, industry trade fairs and public facing engagements. The National Recovery and Resilience Plan looks to maintain relevancy and efficiencies in industry and its key objectives are to accelerate connectivity across industry and will see the increased utilisation of cloud computing, SaaS, data analytics, IoT, blockchain technologies Ai and 5G, supported by the mainstreaming of digital literacy and digital skills enhancement through all tiers of the educational system.

In order to support the digital transition in industry European Digital Innovation Hubs will facilitate digital learning and up-skilling and grant schemes will be introduced to assist businesses in their drive for digital transformation.

The Smart Material & e-Textile Innovation Lab

<https://waltoninstitute.ie/industry/industry-services/testbeds>

Testbeds and laboratories to expand awareness and invite collaboration in the areas of smart material and e-textile research and development are supported at the innovation lab housed in the Walton Institute. Industry standard equipment including conductive inkjet printers and technical embroidery machinery of an industry standard facilitates smart garment prototyping and concept development.

WP2. [Irish National Report]

Page 11

D2.1. Gap analysis report including national and EU reports

© 2023 by [ADDTEX Partnership](http://www.addtex.eu) is licensed under [Attribution-NonCommercial-ShareAlike 4.0 International](https://creativecommons.org/licenses/by-nc-sa/4.0/)



Applications for these technologies extend to the areas of wearables for advance healthcare monitoring, wellbeing, smart interiors, adaptive and smart fashion and intelligent textiles. Re-fashioning the Future with Smart Garments is a recent workshop series hosted by the lab with a focus on eTextile on-body intelligence with support from Creative Ireland and Waterford Council.

**IN TRANSIT – HORIZON [Projects – IDEAM](#)**

*STRENGTHENING THE RESILIENCE OF TEXTILE, AEROSPACE, AND CONSTRUCTION SMES TO TRANSITION TOWARDS GREENER AND MORE DIGITAL SECTORS WITH SOCIAL AND BUSINESS INNOVATION*

In-Transit is a HORIZON project facilitating business model innovation for green and digital transitions with a focus on the textile, construction and aerospace industries. Engaging SMEs through individual assessments to support growth in sustainable, measurable ways and supporting businesses with coaching and lump sum funding for green and digital transitions.

The National Smart Specialisation Strategy for Innovation

[National Smart Specialisation Strategy for Innovation 2022-2027 - DETE \(enterprise.gov.ie\)](#)

The National Smart Specialisation Strategy for Innovation is an innovation policy concept which focuses on potential growth for sectors where strengths and advantages have been identified with respect to regional expertise, resources, technological advancements, geographical locations and connectivity to support sustainable growth through region specific initiatives and enterprises, which in turn will have broader benefits and holistic outlooks, including an expansion in cluster formation and connected networks which can avail of resources and training through RD&I centers.

The policy concept recognises that clustering initiatives spark business growth where the initiatives themselves look to foster B2B and B2RD&I development and partnerships. These cluster initiatives can avail of support in the form of resources spanning the technology readiness level spectrum and specific to their needs.

Figure 2: Competitive advantages with respect to enterprise innovation, Regional Spatial and Economic Strategies (RSEs)

Northern and Western Region	Eastern and Midland Region	Southern Region
<b>Sectoral Strengths and emerging areas of opportunity</b>		
Advanced Manufacturing and Engineering	Advanced Manufacturing	Advanced Manufacturing
AgriFood and AgriTech	Audiovisual	Automotive/Aerospace
Audiovisual/Creative	Biopharma/Life Sciences	Design
ICT and ICT Services	Engineering	Financial Services
Life Sciences, MedTech and Medical Devices	Financial Services/FinTech	Food/AgriTech
Marine and Blue Economy	Food/AgriTech	ICT
Renewable energy, Climate Change mitigation and sustainability	ICT	Marine/Maritime
		Pharma/MedTech
		Renewable Energy



## 4. Impact of the Green, Digital and Smart processes in the industry

Innovation relevant to GREEN:

Innovation linked to green and sustainable futures for the textile industry in Ireland concerns energy consumption, waste materials, fibre quality and sustaining skills.

There were certain areas where concerns align in relation to the Green transition, these were predominantly focused around coping with rising energy costs with many companies adapting operations to deal with rising energy cost and many looking to avail of government supports in the form of the TBES (Temporary Business Energy Support) scheme (Irelandactive.ie).

Solutions of sustainable waste management, supply chain issues, Irish wool fibre quality were also indicated as areas where innovation is required. *The Circular Economy and Miscellaneous Provisions Act 2022* will see Ireland move from the linear Take-Make-Waste model to a more sustainable and circular model ensuring there is accountability for waste generated throughout the industry but at the same time supporting the processes for registering End-of-Waste and By-Products, ensuring there is availability of recycled and secondary raw materials in the Irish market which can support domestic and international business and cater to the waste management needs of the textile companies on the island of Ireland. (GOV IE,2022) One such company is Cirtex, a textile waste and mattress upcycling facility based in Longford.

Given the extent of the textile waste that accumulates within the textile industry there is opportunity to support the domestic needs of the sector and reduce their dependency on municipal waste disposal and selvedge exports.

Green Challenges	Opportunity Recognition
<ul style="list-style-type: none"> <li>● <i>Rising Energy Costs</i></li> <li>● <i>Oil &amp; gas dependency</i></li> <li>● <i>Waste management</i></li> <li>● <i>Up-Cycling of selvedge &amp; textile waste</i></li> <li>● <i>Waste water management</i></li> <li>● <i>No Wool scouring in Ireland</i></li> <li>● <i>Wool grading expertise</i></li> <li>● <i>Scaling and finishing of Wool</i></li> <li>● <i>Access to wet finishing facilities for woollen product</i></li> <li>● <i>Need for breeding &amp; genetic advancements</i></li> <li>● <i>Regional product security</i></li> <li>● <i>Storytelling</i></li> <li>● <i>Dyeing facilities</i></li> <li>● <i>Reliance on UK dyeing</i></li> <li>● <i>Dyeing processes</i></li> <li>● <i>Flaws in product</i></li> <li>● <i>Supply chain</i></li> <li>● <i>Lead times extended and inconsistent</i></li> <li>● <i>Knowledge deficit</i></li> </ul>	<ul style="list-style-type: none"> <li>● Temporary Business Energy Support Scheme &amp; similar</li> <li>● Renewable sources- Solar, wind &amp; hydro</li> <li>● Regional &amp; National processing facilities</li> <li>● By-product categorisation with the EPA</li> <li>● Post scouring, dyeing &amp; finishing</li> <li>● Markets for Irish wool product</li> <li>● Indexing and grading specialists</li> <li>● Expand knowledge and finishing facilities</li> <li>● Wet finishing facilities to support the cluster</li> <li>● High value wool production, connected to FAI</li> <li>● Recognised protected status for Donegal Tweed &amp; Aran</li> <li>● Branding of Irish made product</li> <li>● Licences held but not utilised</li> <li>● Potential for centralised dyeing facility</li> <li>● Hank dyeing, package dyeing and access to piece dyeing</li> <li>● Branding imperfection, marketing opportunities</li> <li>● TMS software- Irish alternative</li> <li>● Sourcing closer to home</li> <li>● Technical skills based training</li> </ul>

<ul style="list-style-type: none"> <li>• Skills preservation</li> <li>• Employee engagement</li> <li>• Employee retention</li> <li>• Recruitment and HR</li> <li>• Lack of specialised training</li> <li>• Design focused graduates</li> <li>• Skill specific areas</li> <li>• Machine maintenance</li> <li>• Servicing and upkeep</li> <li>• Decommissioned machinery</li> <li>• Processing capabilities</li> <li>• Regional fibre production</li> <li>• Biocomposite opportunities</li> <li>• Bio fibres</li> <li>• Alternative fibre innovations</li> <li>• Wool council collaboration</li> </ul>	<ul style="list-style-type: none"> <li>• Industry specific skills for specialist textile</li> <li>• Subsidised apprenticeships 50%</li> <li>• Furlough model and shift based work</li> <li>• International database</li> <li>• Expand certified courses, skillsnet</li> <li>• Expand skill based learning</li> <li>• Linking, sewing, loom operations, knitting technicians, production</li> <li>• Machined parts</li> <li>• Specialist maintenance pool/database</li> <li>• Training tools and potential pivots</li> <li>• Base-line requirements for reintroducing processing for flax &amp; hemp</li> <li>• Fibreshed, Climate Beneficial™ Wool</li> <li>• Automotive, aerospace industries</li> <li>• Product opportunities insulation, fertiliser</li> <li>• Hemp, Galway Wool, Irish Alpaca</li> <li>• Conversations &amp; engagement</li> </ul>
--	--

**Innovation relevant to SMART:**

Innovation linked to smart technologies for the textile industry in Ireland concern cyber security, product traceability and process management systems.

Smart transitions in the textile industry does not extend to e-textiles where the companies involved are concerned however there are developments being made the area of passive smart textiles and biocomposites, generated with native flax and hemp with potential applications for the automotive and aerospace industries which have the potential to embed electronics & sensors. The need exists to understand the processing requirements for a much wider range of fibre and resin systems including bio-composites, recyclable thermosets, bio-based resins, bio-based carbon fibres.

**Innovation relevant to DIGITAL:**

As previously indicated, the digital transition is moving at varying pace in the Irish textiles industries. Some unifying areas upon which companies expressed interest in expanding their awareness related to cyber security, databases for in-house operations & recruitment, e-commerce and marketing support, digital archiving with machine servicing and technical support and maintenance also being and area of concern. A number of the companies work with a UK based TMS software, specifically geared towards the textile industry for streamlining sales, purchasing, manufacturing and dispatch.

Certification, traceability and authenticating products is important to the companies in communicating to their clients and customers and also in the protected status of the textiles being produced. Smart systems that authenticate product such as QR codes add value to the product and instill consumer confidence. Fraud prevention systems such as Strip Radar, utilising machine learning & Ai provide security to companies.

Digital & Smart Challenges	Opportunity Recognition
<ul style="list-style-type: none"> <li>• Knowledge deficit</li> </ul>	<ul style="list-style-type: none"> <li>• Digital skills based training</li> </ul>



<ul style="list-style-type: none"> <li>• Skills support</li> <li>• Software licence costs</li> <li>• Supply and production management tools</li> <li>• Cyber Security</li> <li>• Digital archiving</li> <li>• Virtual garments</li> <li>• Databases</li> <li>• Sensor equipment cost &amp; reliability</li> <li>• Capital investment in new technologies</li> <li>• Manual processing of data</li> <li>• Consumer facing communications</li> <li>• Social media and online platform agility</li> <li>• E-commerce and marketing</li> <li>• Access to funding &amp; finance</li> <li>• Cluster communication</li> </ul>	<ul style="list-style-type: none"> <li>• In-house teams training</li> <li>• Specialist digital software programmes</li> <li>• Irish company opportunity</li> <li>• Recognising threats and identifying vulnerabilities</li> <li>• HD scanning, digital swatches</li> <li>• 3D samples for e-commerce and production communications</li> <li>• Recruitment, suppliers, servicing and maintenance, in-house systems</li> <li>• Exposure to latest sensor systems</li> <li>• Shared resources &amp; collaboration</li> <li>• Smart systems and cloud communication</li> <li>• Shared digital library for PR purposes</li> <li>• Consistent messaging across channels</li> <li>• Market trends and consumer behaviours</li> <li>• Appropriate supports and channels through EI, LEOs +</li> <li>• Portal, hub for engagement</li> </ul>
--	---

#### 4.1.1 Green

Table 4. Green

Functional areas of the company	Technology/innovation/Changes	Knowledge needed to perform the process	Priority Training Topics to be addressed
Post Production Waste	Sustainable waste management solutions for wool and linen based product	By product applications for textile waste.  EPA registration process for categorization of by-product	Wool waste regeneration techniques for protein fibre product.  Linen waste regeneration techniques for cellulosic fibre product.  Life Cycle Assessment, LCA framework
Recruitment	Design based learning is impacting on technical skill preservation and sustaining of knowledge relating to the Irish textile industry	Technical skills linked to traditional manufacturing and contemporary industrial practices	Technical skills in wool grading, scouring, carbonizing, carding, spinning, dying, knitting, weaving (hand and industrial mechanized looms), non woven processes
Raw materials processing- Scouring Dying Finishing	Raw materials processing for wool excludes scouring & access to dying is very limited . These processes are managed in the Uk and further afield. A small number of companies manage finishing but this reliance	Environmental implications for wool scouring and dying in Ireland. Number of existing licenses held for dying operating and market demand	Green solutions for wool scouring and dying at scale and broader range of finishing processes accessible



	could also prove precarious and does not support sustainable growth		
--	---	--	--

#### 4.1.2 Digital

Table 5. Digital

Functional areas of the company	Technology/innovation/changes	Knowledge needed to perform the process	Priority Training Topics to be addressed
CAD & CAM Computer aided design and Computer aided manufacturing E-Commerce	Digital systems and software  Consumer facing platforms for branding & marketing  Digital libraries for archiving swatches and using with software supporting knitwear and woven textile simulations	Digital system and design software- Adobe suite, Microsoft 365, TMS software, SAP, Silk, Shima Seiki Hi definition 3D scanning Simulation software	Digital supply and production management tools  CAD & CAM programmes  Digital libraries to support archiving and PR  Routes to funding available for specialised training support
Internal databases Consumer facing platforms	Cyber security	Vulnerabilities and systems susceptible to breaches.	Cyber security best practice, GDPR and communications
In house and consumer facing operations	Databases and archiving	Collaboration and by-in from external parties for knowledge sharing of existing data in areas of recruitment, suppliers, in-house data storage,	

#### 4.1.3 Smart

Table 6. Smart

Functional areas of the company	Technology/innovation/changes	Knowledge needed to perform the process	Priority Training Topics to be addressed
Product/Fibre Track & Trace	Certification & Traceability	Supply chain and securing buy in from all parties.  In depth understanding of the consumer, their	Creating QR codes Story telling and branding Farm to Yarn

		practices, digital agility and willingness to engage.	
Fibre processing and Spinning, Weaving & Knitting	Bio-composite applications	Bio-composites applications and structural composition of woven and knitted textiles suitable for bio-composite applications.	Processing requirements for range of fibre and resin systems including bio-composites, recyclable thermosets, bio-based carbon fibres and resins in conjunction with smart sensor technologies.

## 5. Initial and further education on advanced textiles

The following section outlines the systems of qualification, educational platforms and projects taking place at a national and regional level.

- [First Certified Weaving Course in Ireland Launched – Donegal ETB](#)
  - [Re-Fashioning the Future with E-Textiles - Irish Tech News](#)
  - [TUS | BA \(Hons\) in Fashion \(lit.ie\)](#)
  - [TUS | Certificate in Design for Sustainability and Circular Economies](#)
  - [Textile & Surface Design - National College of Art and Design \(ncad.ie\)](#)
  - [LCFE Mulgrave St Campus | Knitwear Design for Fashion & Textiles \(Fashion Design\) | 5M2208](#)
  - Sample of industry specific accessible online offering- [Online Training Courses | SERVICE | STOLL](#)
- A. The full-time Donegal Weaving traineeship has been developed by Donegal Education and Training Board (ETB) through its Further Education and Training (FET)

Service and is certified by the **Scottish Qualifications Authority**. It was developed by the ETB following a consideration to support the preservation of Donegal Weaving as an indigenous craft which existed for centuries, taking on its modern form after the famine with the founding of Magee Clothing in 1866.

- The average age of a Donegal weaver today is around 75 years which means that both the power loom and handweaving industries face a succession risk: skills that are unique to weaving such as loom tuning, warping and finishing are quite niche and, without future weavers being trained, are at risk of extinction. This course develops the skills and craftsmanship of a Donegal weaver, ensuring a continuity of skills for these industries.

Current students generally range in age from late teens to late 50s with some coming from third and fourth generation weaving families and proudly using their grandfather's looms to carry on the tradition. A number have relocated from Dublin and Meath to Donegal for its duration.

- B. A community of traditional textile craft practitioners with experts from Walton's new Electronic Textiles (E-textiles) Lab are collaboratively exploring and investigating e-textiles with the LilyPad sewable range of electronic components, conductive fabrics, and conductive thread.

Re-Fashioning the Future aims to engage traditional craft/textile makers in e-textiles and provide the technical skills and know-how to sew simple electronic circuitry in fabric with conductive thread, allowing for creative outputs with added functionality. Reconfiguring traditional substrates into soft, flexible circuitry with conductive thread and ink opens new opportunities for wearable Internet of Things (IoT) applications across a variety of sectors including wearable healthcare monitoring, innovative fashion, entertainment, wellbeing, and interior design.

- Design for Sustainability and Circular Economies is a continued professional development (CPD) course at TUS, focusing on key areas of Life Cycle Thinking, Circular Economy Principles and Regenerative Design Practices.

- C. Entry into this The BA (Hons) Level 8 course happens through competition and selection during First Year Art & Design. The internationally acclaimed course is the only programme in Ireland that currently shows at Graduate Fashion Week London. Listed amongst the 'Top 50 Fashion Schools and Programs across the Globe' (Robin Wilding 2012) Offering a high level of practical learning through studio projects, talks, workshops and one-on-one tutorials. Students will explore the many and varied practices within fashion and textile design and are exposed to a range new ideas and engage with an array of skills.

- D. Design outcomes are realised through the production of design samples, fabric collections, visualisations and/or products and prototypes. The college offers an excellent range of facilities for realising design work including digital print, screen print, transfer print and weaving while external manufacturing services such as laser-cutting, computer-aided weaving, multi-head embroidery, and finishing are also utilised.

- E.QQI Level 5

City & Guilds Level 3 Certificate in Design & Craft 7716-16 Hand Knitted Textiles

The aim of this programme is to provide learners with a comprehensive introduction to all aspects of knitted textiles in art, fashion, accessories and interiors. There is a strong focus throughout the programme on applying knowledge and skills practically to produce real results. Traditional and contemporary techniques will be explored including hand and machine knitting, crochet, felting and weaving. A Textiles portfolio of work which reflects the learner's ability to deliver creative and original responses to knitted and woven textiles is prepared in the year. This is essential for those wishing to gain entry to Art Colleges or to seek employment in the knitwear industry. Awards:

- F. The BA (Hons) in Textile & Fashion Design is a 3-year course following the first-year common entry course. Applications for Advanced Entry from those with an appropriate FETAC Level 6 qualification (or equivalent) and/or relevant prior learning are also welcome.

Topics on the programme include Photography, Digital Media, Design History & Theory, Creative Problem Solving, Business & Entrepreneurial skills and an Ethical and Sustainable Design ethos. Textile & Fashion Design students will learn about fashion concepts, textile and surface design, woven textile design and practice, accessory design, fashion textile research and development, 3D construction, textile fabrication, and fashion directions.

- [Online Training Courses | SERVICE | STOLL](#)

Stoll offers a range of knitwear industry specific courses, ranging from digitally developed flat knitted garments for simulation to digital pattern design and development for product outputs.

## 6. Conclusions

In conclusion this report finds that there is opportunity to advance the industrial digital and green innovations in the Irish textile industry through innovation in learning and training. CIRCULÉIRE Circular Fashion & Textiles Good Practice Sectoral Guide looks to shine light on the opportunities to move from the linear take-make-waste model and transition to a circular model in which Irish textiles can expand their post-production and consumer value chain. As a result of this research, a number of the participating companies are currently trailing post-production textile recycling with a view to re-purposing the by-products of their manufacturing. There is interest in how they can continue to diversify in this area.

The programme to drive digital transformation of enterprise in Ireland will see an increase to financing streams in support of businesses looking to invest and scale in digitisation. Through these routes to finance and the European Digital Innovation Hubs companies will be supported in their digital transition and maintain relevance in key areas of their internal and consumer and client facing operations. The National Smart Specialisation Strategy recognises that clustering initiatives offer a great deal of potential to act as catalysts and spark business growth where the initiatives themselves look to foster B2B and B2RD&I development and partnerships.

Focused Labs such as the Walton institute can support the cluster companies smart textile development in previously unidentified markets relating to advanced innovative fashion, healthcare monitoring, wellbeing and smart interior design.

A clear need for technical skill-based learning has been expressed by the industry. The advent of remote working has seen increased accessibility in the area of specialised training. Previously companies would travel in person for training days, now, provided an individual has access to the software and machinery, training can be conducted remotely. This presents opportunities for HEIs, VETs, innovation hubs and companies themselves to facilitate specialist training and support industry growth.