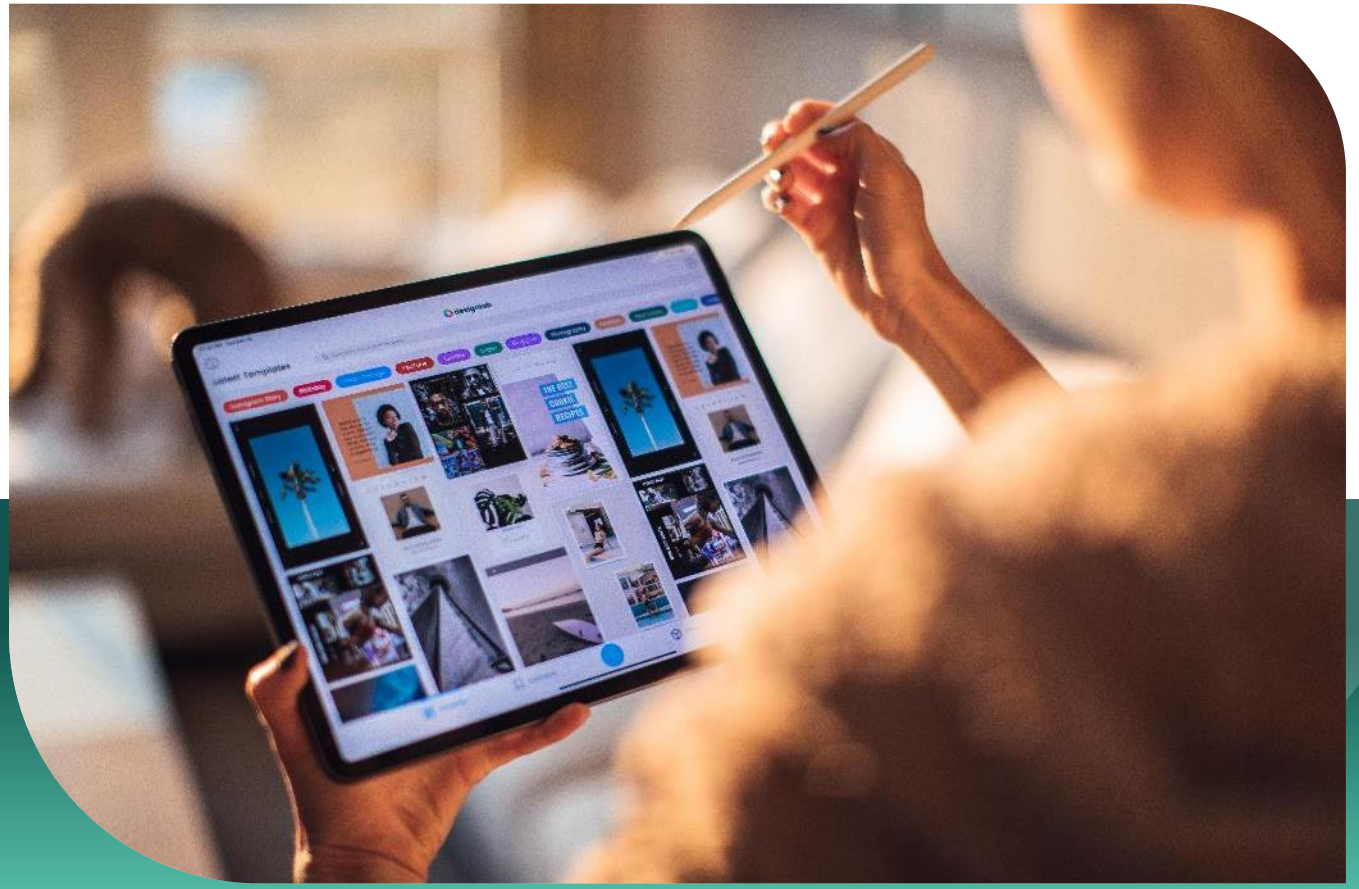
Entrepreneurship Education

START DSP

Digital - Sustainable - Profitable



Module 3 (Part 1)

Digital Business Models – Designing for Impact in a Tech-Driven World

www.startdsp.eu

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Module 3 Overview

This module explores how green and digital principles come together to shape modern business models. Learners will examine how sustainability, circular thinking, and digital tools support responsible innovation and help build future-ready businesses. They will develop core skills in model design, environmental awareness, and digital problem-solving. By the end of this module, learners will have outlined a simple green digital business model and identified how it could be taken forward practically and sustainably.

01 Foundations of Green Digital Entrepreneurship

Introduction to the core ideas linking sustainability and digitalisation, and how these shape new forms of entrepreneurship.

02 From Circular Ideas to Digital Execution

Explore how circular economy principles can be combined with digital tools to design practical and responsible business models.

03 Bringing Green Digital Models to Life

Understand what is needed to turn a green digital concept into a workable plan, including early implementation steps and measuring real-world impact.

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Module 3 (Part 1) Interactive Learning Elements

- **44** Slides
- **01** Exercise
- **01** Videos
- **02** Examples
- **16** Digital Tools
- **02** Toolkits & Guides
- **06** Articles & Reports

Learning Outcomes

By the end of this module, learners will be able to:

- **Business Skills:** Develop clear green digital business ideas, apply basic strategic thinking, and plan simple steps for sustainable business development.
- **Green Skills:** Use circular and environmentally responsible thinking when designing business ideas, and recognise how business models can reduce environmental harm.
- **Digital Skills:** Use straightforward digital tools to support model design, explore data, and carry out basic sustainability tracking.

Competences Developed in Module 3

01

Business Skills

Understanding sustainable digital business models and identifying opportunities where digital innovation supports environmentally responsible value creation.

02

Green Skills

Applying systems thinking to understand environmental impact and exploring sustainable approaches such as circular and low-carbon business practices.

03

Digital Skills

Developing digital literacy and using digital tools and platforms to support sustainability analysis and greener business solutions.

01

Foundations of Green Digital Entrepreneurship

Sustainable digital entrepreneurship involves building and scaling online businesses with a dual focus on both profit and long-term social and environmental benefits.

Rather than focusing solely on profit, sustainable digital entrepreneurship uses technologies, such as e-commerce platforms, cloud-based computing, and virtual collaboration tools—to reduce the environmental footprint and maximise the positive

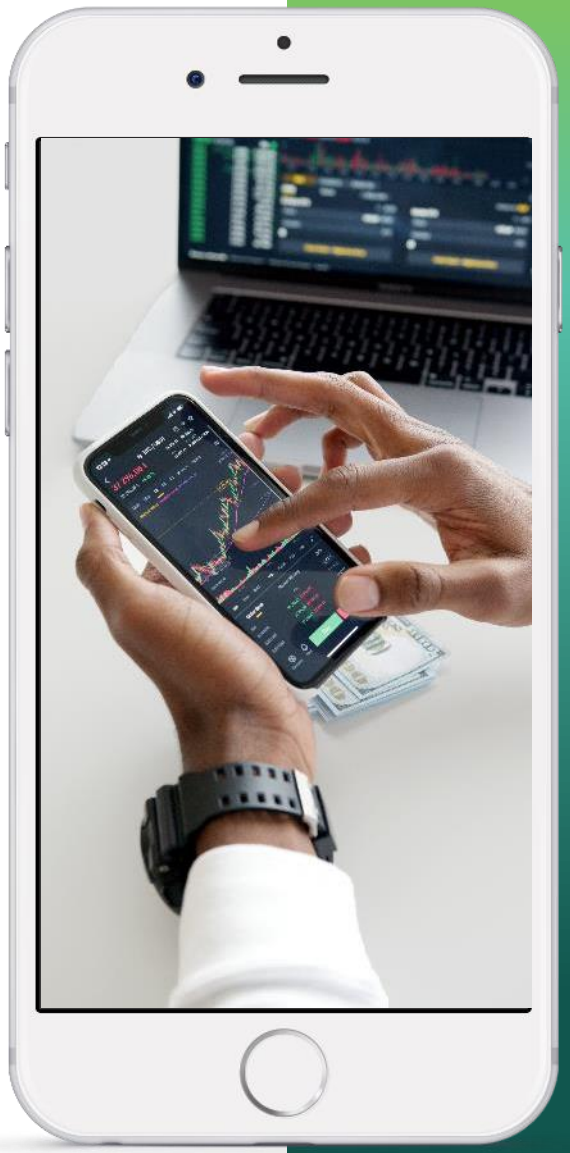
- Prof Dev Journey (2025)

Introduction to This Section

Foundations of Green Digital Entrepreneurship

This section explores how green and digital transformations are reshaping the way businesses create value.

- Learners will examine why sustainability, and digital tools increasingly go hand in hand, and how this shift opens new opportunities for innovation.
- The focus is on understanding the principles that underpin green digital business models, the mindset required to develop them, and the early skills needed to start designing responsible and future-focused ventures.



Global Context: Why Green + Digital?

Why this matters;

- **Environmental pressures:** Climate change, resource shortages, and waste are pushing organisations to rethink how they operate.
- **Policy and regulation:** EU initiatives such as the **European Green Deal** encourage low-carbon business models and greater digital transparency.
- **Changing customer expectations:** People and organisations are increasingly choosing products and services that are responsible, efficient, and traceable.
- **Digital tools as enablers:** Technologies such as data analytics, sensors, and cloud platforms help track resource use, support circular models, and improve sustainability reporting.

Green digital entrepreneurs use digital tools to respond to environmental challenges and create more sustainable ways of doing business.

Key Concepts: Green Business Models

What is a green business model?

A green business model creates value while reducing environmental harm. It focuses on using resources responsibly and designing products, services, and operations that support long-term sustainability.

Core ideas:

- Reducing waste and emissions
- Using resources efficiently
- Designing products for reuse, repair, or longer life
- Offering services instead of products (e.g., rental, sharing, subscription)
- Creating value that benefits both the business and the environment

Key Concepts: Digital Entrepreneurship

Why it matters for sustainability: Digital tools help track environmental performance, support circular practices, and make sustainable solutions easier to manage at scale.

What is digital entrepreneurship?

Digital entrepreneurship involves using digital tools, data, and online platforms to develop new products, services, and ways of operating. It focuses on innovation through technology.

Core ideas:

- Creating or delivering value through digital channels
- Using data to understand customers and improve decisions
- Building services that are more flexible, scalable, and efficient
- Automating tasks to reduce cost and improve reliability
- Developing new business models that are only possible with digital tools

Why the Intersection Matters

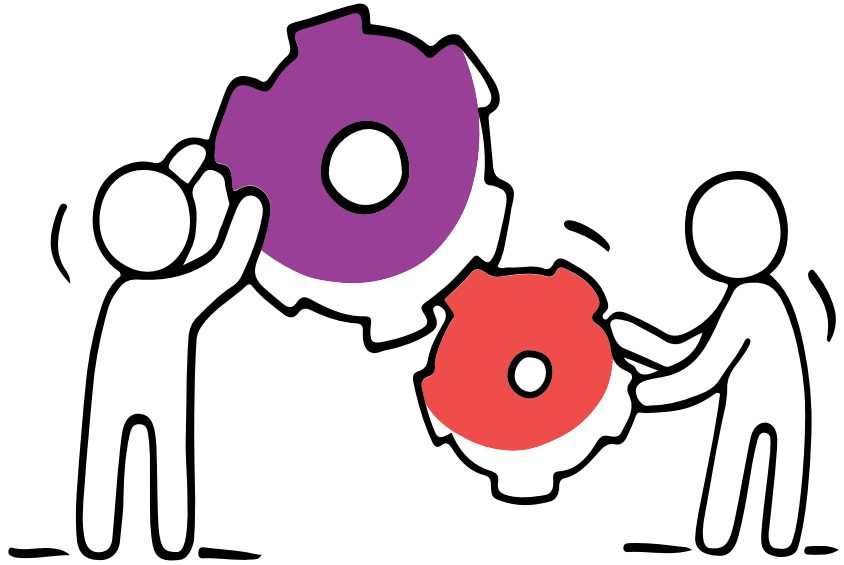
Sustainability and digitalisation are closely linked, and the circular economy offers a clear example of this. The **Ellen MacArthur Foundation (2021)** highlights that digital tools are essential for coordinating circular systems, as they track where materials are, how products are used, and when they are ready for repair, reuse, or recycling. Without digital support, this coordination becomes much harder.

Digital platforms help businesses track products throughout their lifecycle, while sensors and connected systems monitor wear, maintenance needs, and energy use. Sharing and rental schemes also rely on digital tools to match supply with demand and manage logistics. In each case, digital technology makes circular practices easier to run, more reliable, and more scalable.

Why the Intersection Matters

- Digital tools are not simply add-ons; they provide the information and structure needed to design business models that use resources more wisely and operate more efficiently.

- Understanding this connection helps entrepreneurs see how digitalisation supports more sustainable and practical ways of creating value.



Mindset for Green Digital Entrepreneurship

01

Green Digital Entrepreneurship Mindset

Green digital entrepreneurship brings together sustainable values and the intelligent use of digital technology. The EU GreenComp Framework (2022) sets out principles that help shape this mindset. Two of the most important for this field are systems thinking and responsibility.

02

Systems Thinking for the Bigger Picture

Systems thinking encourages entrepreneurs to see the bigger picture. It helps them understand how materials move through a system, how digital tools influence behaviour, and where environmental pressures emerge. This broader view makes it easier to spot where digital solutions—such as data platforms or automation—can support more sustainable practices.

03

Understanding Green & Social Decisions

The second principle, responsibility, focuses on recognising the environmental and social effects of entrepreneurial decisions. For green digital entrepreneurs, this means using digital tools in ways that support long-term sustainability, rather than simply chasing efficiency or convenience. It encourages careful choices about materials, energy use, data practices, and business impacts.

Skills that Support Green Digital Innovation

Alongside this mindset, green digital entrepreneurship depends on a set of practical skills. The **EU Digital Competence Framework (DigComp)** outlines many of the capabilities needed to develop responsible digital solutions.

A key skill is **critical thinking**, particularly when working with digital information. Entrepreneurs must be able to assess environmental data, question assumptions, and judge whether a digital tool genuinely supports sustainability aims. This helps avoid "greenwashing" and ensures decisions are based on evidence.

A key skill is **critical thinking**, particularly when working with digital information. Entrepreneurs must be able to assess environmental data, question assumptions, and judge whether a digital tool genuinely supports sustainability aims. This helps avoid "greenwashing" and ensures decisions are based on evidence.

Basic **digital literacy** supports the practical side of innovation. Even simple tools—such as spreadsheets, data dashboards, mapping tools, or prototyping platforms—allow entrepreneurs to test ideas, understand impact, and communicate clearly with others.

2025 Spotlight: Digital–Circular Action

The shift in 2025: Circular economy innovation is moving from pilot projects to regulatory and operational readiness. Entrepreneurs should track three key developments.

1. Digital Product Passport (DPP) Readiness

The **Ecodesign for Sustainable Products Regulation (ESPR)** standards are now finalised. Mandatory DPPs for textiles and electronics start in **2027**, but companies are already testing **“shadow passports”**.

Start collecting product data now: **materials, origin, repairability**.

2. AI in Recycling Systems

AI is now operational in waste sorting and materials tracking. Companies such as **AMP Robotics** and **Nestlé** are designing packaging detectable by robotic sorters.

AI systems are reaching **over 95% material purity** in recycling streams.

3. Crackdown on Greenwashing

The **EU Green Claims Directive** will require **evidence-based environmental claims**.

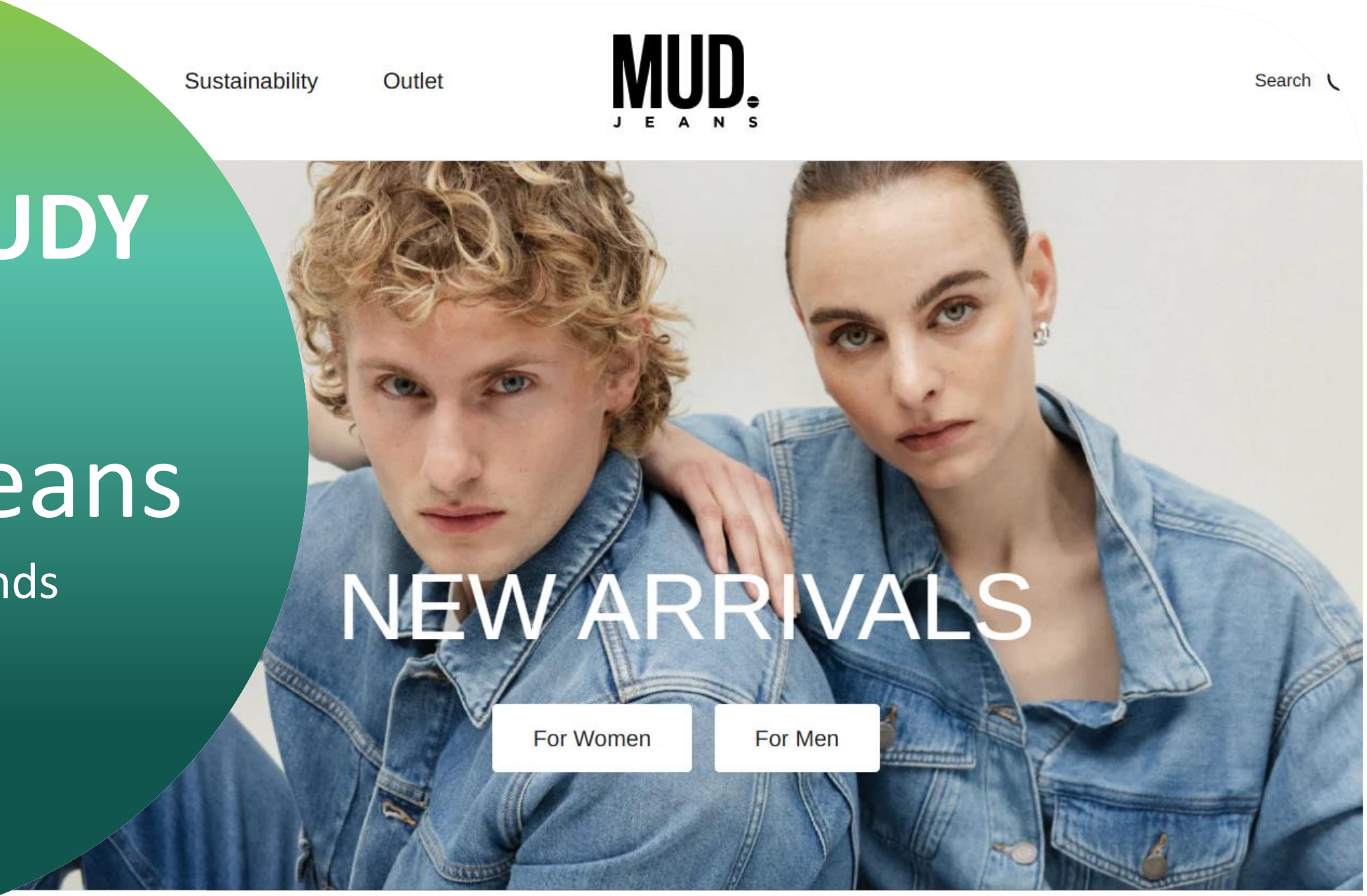
The **EmpCo Directive** begins implementation in **2026**.

Sustainability claims must be **verifiable and data-backed**.

CASE STUDY

MUD Jeans

Netherlands



The Business Model: "Lease A Jeans”

Instead of the traditional "take-make-waste" model, MUD Jeans treats its denim as an asset rather than a disposable product.

Product-as-a-Service (PaaS): Customers can "lease" a pair of jeans for a monthly fee. After a year, they can swap them for a new pair, keep them, or return them.

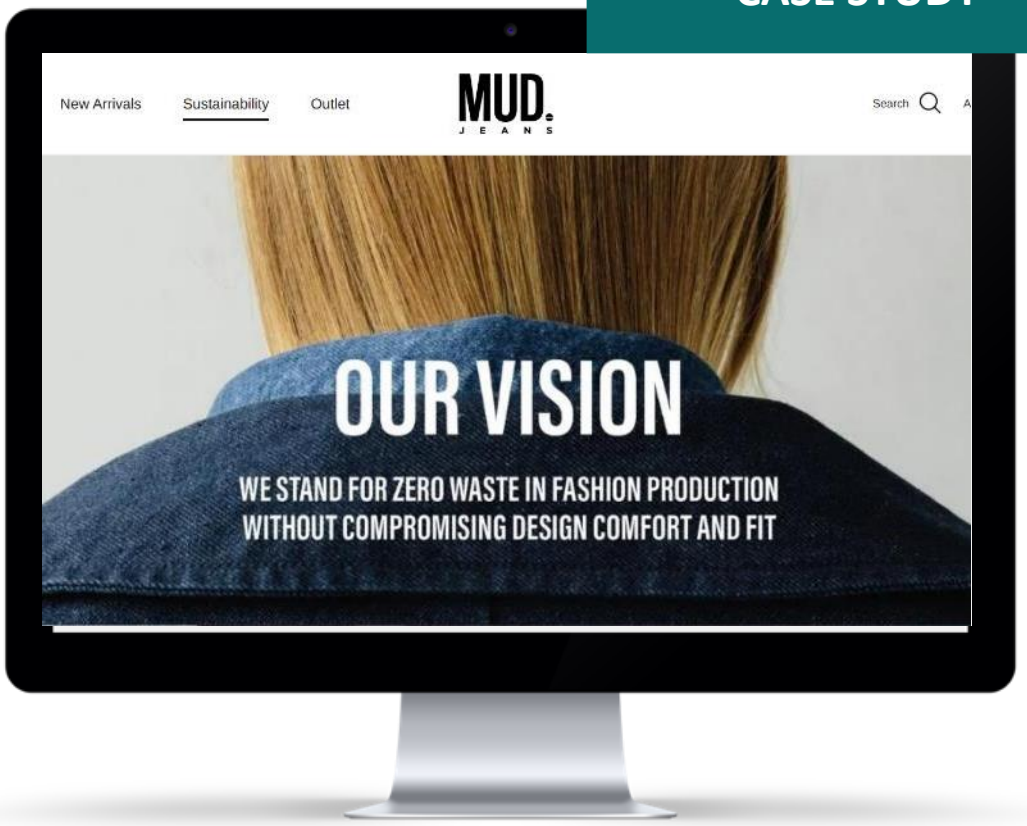
Closed-Loop Recycling: When jeans are returned, they are sent back to the factory, shredded, and blended with organic cotton to create new denim. As of 2025, they have reached a milestone of using 65% post-consumer recycled cotton in their new products, with a goal of 100% by 2026

The Digital Edge: Digital Product Passports (DPP)

CASE STUDY

In 2025, MUD Jeans is a leader in the DPP4CD (Digital Product Passport for Circular Denim) project.

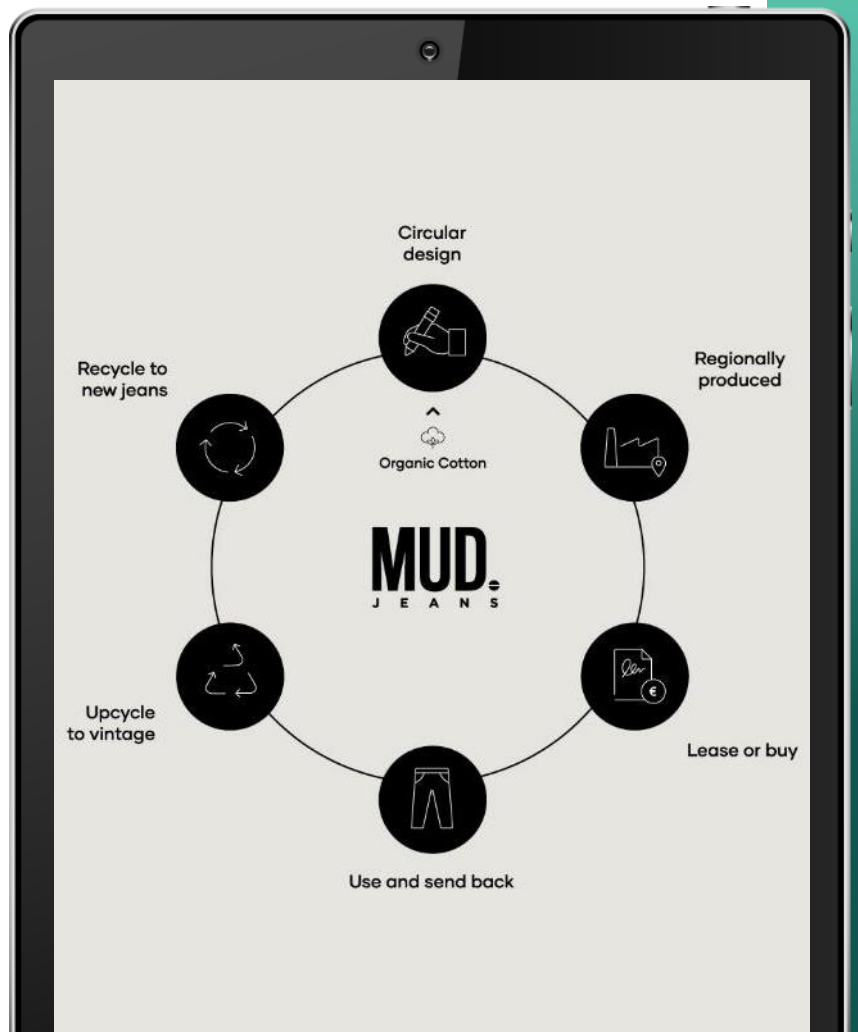
Transparency: Each pair of jeans features a digital tag (QR or NFC) that acts as a "passport.“
Data Flow: This passport stores information on the fabric composition, the factory where it was made, and—crucially—its repair and recycling history.
Compliance: This prepares them for the 2027 EU regulations, proving that "Green Impact" is also a smart regulatory strategy.



Digital and Circular Fashion

CASE STUDY

MUD Jeans combines circular design with digital transparency to create a more sustainable fashion model. Through its **“Lease A Jeans”** system, customers subscribe to use denim rather than owning it outright, returning items after use so the materials can be recycled into new products. The company designs jeans for durability and recyclability, supporting a closed-loop production process that reduces textile waste and raw material use. At the same time, digital tools such as product data tracking and digital product passports help record material composition, production details, and repair or recycling history. This integration of **circular design and digital traceability** shows how technology can support more sustainable and transparent supply chains in the fashion industry.



Digital Tools: Supporting Coordination and Practical Delivery

Digital tools are essential for coordinating many green and circular models. Platforms that manage sharing, rental, or repair systems rely on digital structures to match supply with demand, record usage, and organise logistics. Without this support, many circular ideas would be difficult to run at scale.

Simple tools—such as project management software, mapping tools, and digital communication platforms—also help with planning and organisation. They make it easier to structure tasks, track progress, and work effectively with partners or customers.

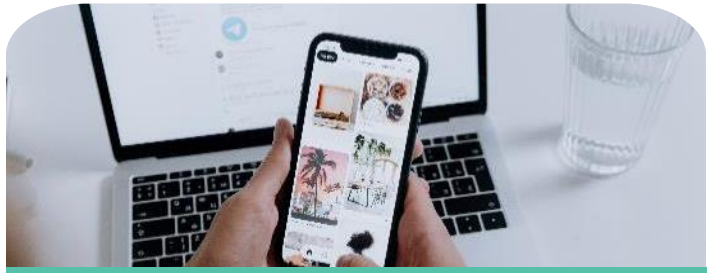
The key principle is purposeful use. Digital tools work best when they directly support a sustainability goal, such as reducing waste, increasing transparency, extending product life, or helping a circular system run smoothly. Chosen wisely, they strengthen both the operational and environmental performance of a business.

Digital Tools: Supporting Coordination and Practical Delivery

"We will use Trello to manage tasks, Google Docs for documentation and planning, Canva for designing promotional graphics, and Microsoft Teams or Slack free plan for team communication." By planning this, you ensure everyone knows where to collaborate and its affordable to your project.

Google Forms

If your solution requires scheduling or mapping, there are Google Forms (for feedback or sign-ups),



Google Maps

Google Maps API helps customers easily navigate to your offering and discover what's nearby—strengthening your value proposition and guest experience.

Miro AI Workspace

A collaborative online platform workspace with AI to accelerate workflows, design acceleration and needs for business, drive transformation and clarity.

Green Opportunities Through Digitalisation

Digitalisation creates a range of opportunities for greener and more efficient business models. When used with a sustainability purpose, digital tools can open up new ways of designing, delivering, and improving products and services. **Key opportunities include:**

Better use of Resources: Data and analytics help identify waste, reduce energy use, and optimise material flows.

Improved transparency: Digital reporting and traceability tools help businesses meet environmental standards and share reliable information with customers or partners.

New Circular Models: Digital platforms enable sharing, rental, repair, and product-as-a-service models that keep materials in use for longer.

Green Opportunities Through Digitalisation

Digitalisation creates a range of opportunities for greener and more efficient business models. When used with a sustainability purpose, digital tools can open up new ways of designing, delivering, and improving products and services. **Key opportunities include:**

Smarter Decision-making: Real-time information supports choices that lower environmental impact and improve efficiency.

More Accessible Innovation: Digital reporting and traceability tools help businesses meet environmental standards and share reliable information with customers or partners.

Practical Exercise: Exploring Digital Opportunities

Learning aim: To begin linking sustainability challenges with practical digital solutions that could support greener business models. This short activity helps learners connect digital tools with real sustainability challenges. The aim is to begin identifying where digitalisation might support greener ways of working.

1. Choose a simple product or service

(e.g., takeaway coffee cups, clothing rental, home cleaning, bikes, food delivery)

2. Identify one sustainability challenge

Examples: waste, energy use, transport, packaging, resource management. Discuss how a digital tool could help

3. Discuss how a digital tool could help

- Could a platform support sharing or reuse?
- Could data help reduce waste or improve planning?
- Could sensors track condition or usage?
- Could digital reporting support transparency

4. Share one idea with the group

Keep the focus on how digitalisation could make the process more efficient, more responsible, or more circular.

Challenges: Data, Tools & Skills

→ Data quality and reliability

Green digital ventures depend on accurate information, yet many organisations face gaps in data, inconsistent measurement, or uncertainty about what to track. Weak data can lead to poor decisions or ineffective solutions.

→ Access to tools and skills

Not all entrepreneurs have the technical skills or resources needed to build digital systems for tracking, reuse, or impact measurement. Choosing simple, appropriate tools is often more effective than adopting complex solutions too early.

→ Avoiding over-engineering

Digital tools should support sustainability aims, not complicate them. Early-stage ventures risk building systems that are too heavy, costly, or unnecessary for their current stage of development.

Challenges: User Behaviour & Adoption

→ **User participation**

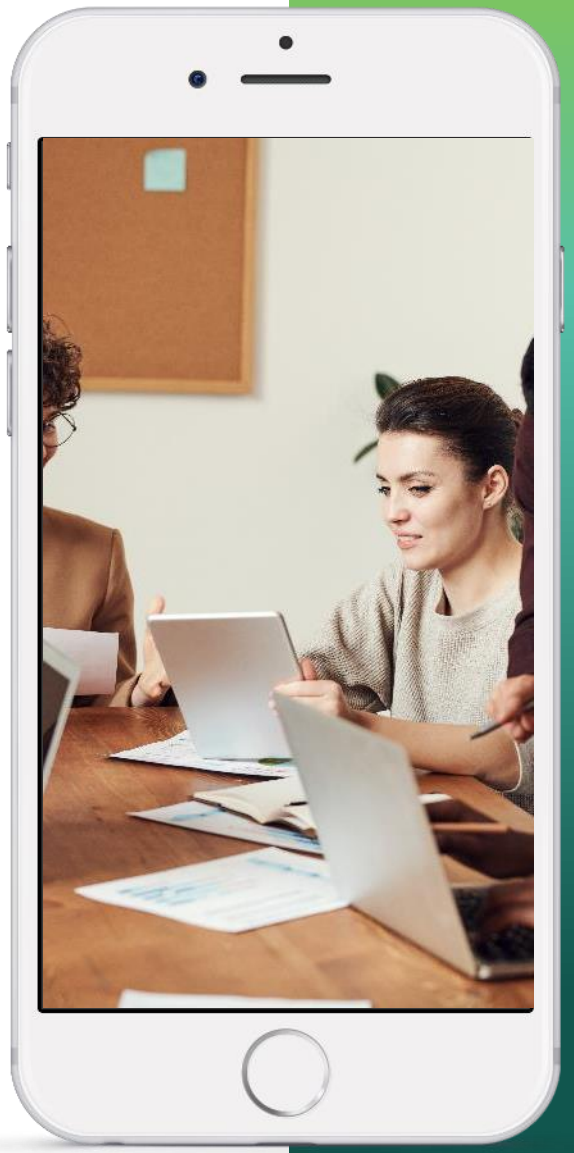
Many green digital models rely on customer behaviour—returning items, scanning products, or using an app correctly. If the digital journey is confusing or inconvenient, adoption drops quickly.

→ **Designing for ease**

Simplicity and clarity are essential. Digital steps need to feel seamless for users, otherwise even well-designed circular ideas struggle to gain traction.

→ **Encouraging long-term engagement**

Sustained use requires ongoing communication, reminders, or incentives. Without this, behaviour change often fades over time.



Challenges: Growth, Impact & Regulation

→ **Scalability pressures**

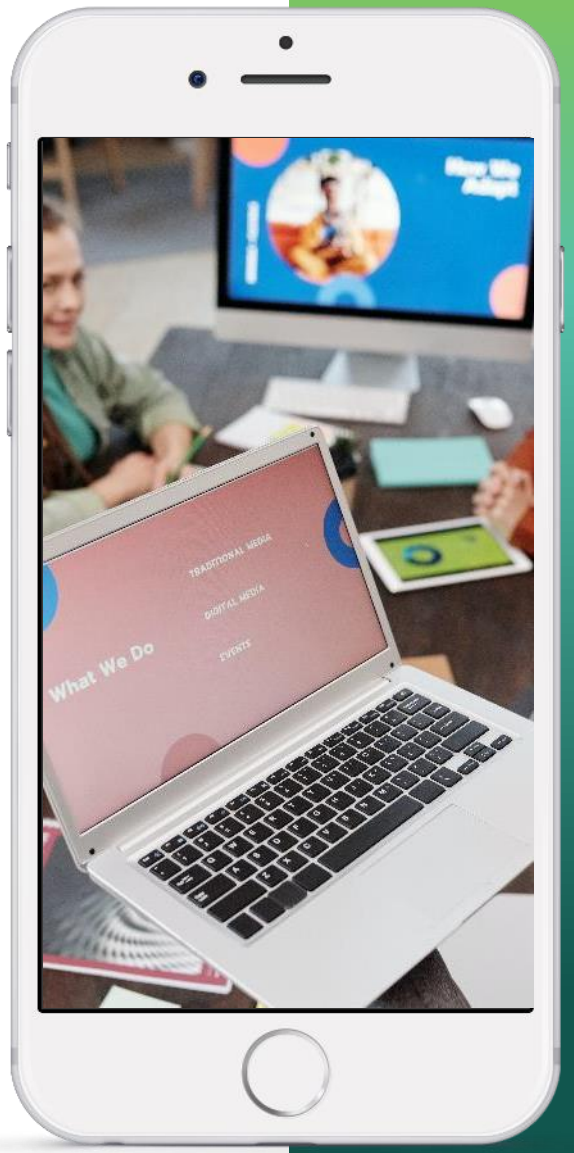
Systems that work at a small scale can become difficult to manage as numbers grow. Higher volumes may require upgraded digital tools, stronger processes, or new data capabilities.

→ **Environmental trade-offs**

Digital tools have their own footprint: devices, energy, and server use. Entrepreneurs must ensure that digital solutions genuinely support environmental aims rather than introduce new impacts.

→ **Regulation and standards**

Both sustainability and digital fields evolve quickly. New expectations on data, reporting, or environmental performance may require changes to the business model or digital setup.



The Green Digital Ecosystem

Green digital entrepreneurship does not operate in isolation. It depends on a wider ecosystem that supports innovation, provides guidance, and helps ideas reach the market.

Key elements of the ecosystem include:

- ✓ Policy and regulation – frameworks such as the European Green Deal, digital reporting rules, and circular economy strategies.
- ✓ Funding and support – grants, incubators, accelerators, and impact-led investment.
- ✓ Education and training – universities, skills programmes, and digital learning platforms.
- ✓ Networks and communities – industry groups, circular economy networks, and sustainability alliances.

Key Stakeholders and Their Roles

Successful green digital ventures work with a range of stakeholders who influence design, delivery, and long-term impact. **Stakeholders include:**

Customers – adopt new behaviours, use digital tools, and give feedback.

Suppliers and partners – support circular models through materials, logistics, repair, or digital integration.

Technology providers – offer platforms, analytics, and digital infrastructure.

Public sector and regulators – set environmental standards and provide incentives for sustainable solutions.

Investors and funders – support innovation and expect credible environmental performance.

Working Across the Ecosystem

To succeed, entrepreneurs need to understand how these stakeholders connect and where collaboration creates value.

Key considerations:

Aligning the digital solution with real needs in the system

Partnering early to access skills, tools, or materials

Communicating environmental benefits clearly to build trust

Designing solutions that are easy for partners and users to adopt

Staying responsive to policy changes that influence the model

Working across the ecosystem helps ensure the business is realistic, supported, and ready for long-term growth.

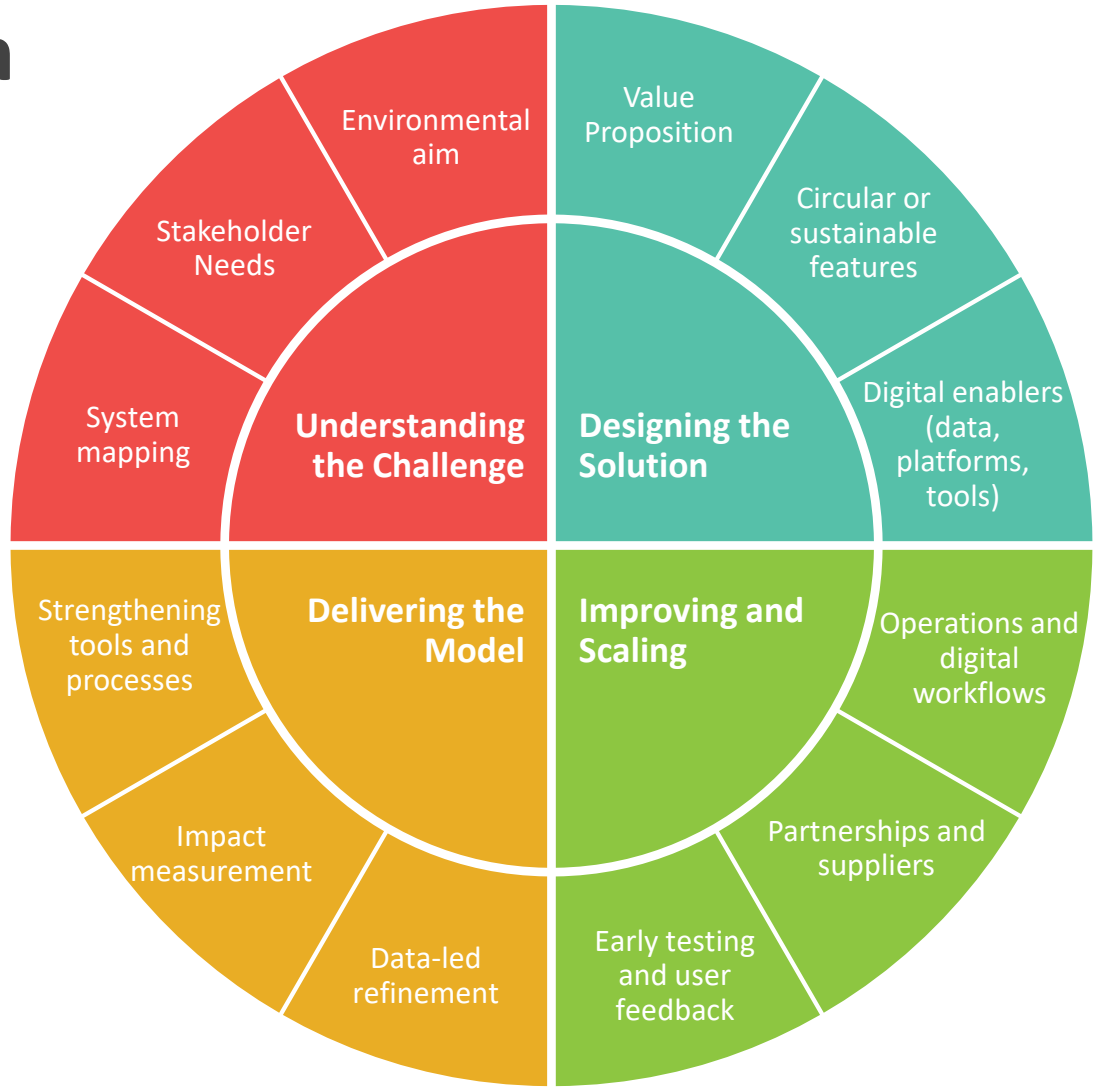
Business Model Design: Starting with the Problem

Designing a green digital business model starts with understanding the sustainability challenge and the wider system it operates in. In Europe's **Twin Transition (Digital + Green)**, entrepreneurs must consider regulation, digital infrastructure and user behaviour from the outset.

- → Identify the environmental challenge - Define the main issue, such as waste, emissions, inefficient resource use, or lack of transparency. EU rules on environmental claims (EmpCo and the Green Claims framework) require clear, evidence-based sustainability claims.
- → Map the wider system - Examine materials, supply chains, stakeholders and regulation. Tools such as **Digital Product Passports (DPP)** and **GS1 Digital Link identifiers** are enabling lifecycle tracking across the value chain.
- → Clarify user needs - Identify which behaviours must change and the barriers users face. Frameworks such as **DigComp 3.0** highlight the digital and sustainability skills needed for green–digital innovation.
- → Define the sustainability aim -Set a clear environmental goal, such as reducing waste, lowering emissions, or enabling circular material flows. EU initiatives like the **Digital Europe Programme** support these green–digital solutions.

Four-Point Model of Green Digital Business Model Design

Our Four-Point Model of Green Digital Business Model Design provides a simple structure for shaping sustainable, digitally enabled business ideas. It guides learners through the key stages of understanding an environmental challenge, designing a digital-supported solution, delivering it in practice, and improving it over time. The model helps ensure that sustainability aims and digital tools are fully aligned, practical, and ready to develop further, drawing on research in sustainable business model innovation and circular economy design (Bocken et al.; Ellen MacArthur Foundation).



Bringing the Business Model Together

Once the challenge and core design choices are clear, the next step is to organise the business model into a simple, practical structure. This helps explain how the idea works, why it creates environmental value, and how digital tools support it. The approach builds on established business model and circular economy frameworks.

Key elements:

- **Value Proposition** — the problem solved and the sustainability value offered
- **User Experience** — how people interact with the digital and sustainable features of the solution
- **Operations** — the processes and digital workflows needed to deliver the model
- **Resources & Partners** — tools, skills, and collaborations required to operate the model
- **Environmental Impact** — how environmental improvements will be measured and tracked
- **Viability** — basic costs, revenue streams, and the potential for responsible growth

This structure supports the development of business models that are **practical, digitally enabled, and environmentally responsible.**

Practical Application: Why Apply These Ideas?

Putting the concepts into practice helps learners move from understanding the principles of green digital entrepreneurship to seeing how they work in real situations. Applying the ideas shows how business models are shaped, tested, and refined using digital tools and sustainability thinking. **This stage encourages learners to:**

Experiment with simple digital tools

Analyse real examples of green digital businesses

Explore how data, platforms, or tracking systems support sustainability goals

Begin shaping their own ideas using the four-point model

Practical Tools: Simple Digital Tools That Support Design

A range of accessible digital tools can help early-stage entrepreneurs explore and develop green digital business ideas.

These tools do not require advanced expertise and are useful for testing assumptions and mapping early ideas. Examples include:

Miro or Mural – for mapping systems, value propositions, and early business model ideas

Google Forms or Typeform – for gathering user insights and understanding behaviours

Trello or Asana – for organising tasks, planning small pilots, and tracking progress

Practical Tools: Simple Digital Tools That Support Design

A range of accessible digital tools can help early-stage entrepreneurs explore and develop green digital business ideas.

These tools do not require advanced expertise and are useful for testing assumptions and mapping early ideas. Examples include:

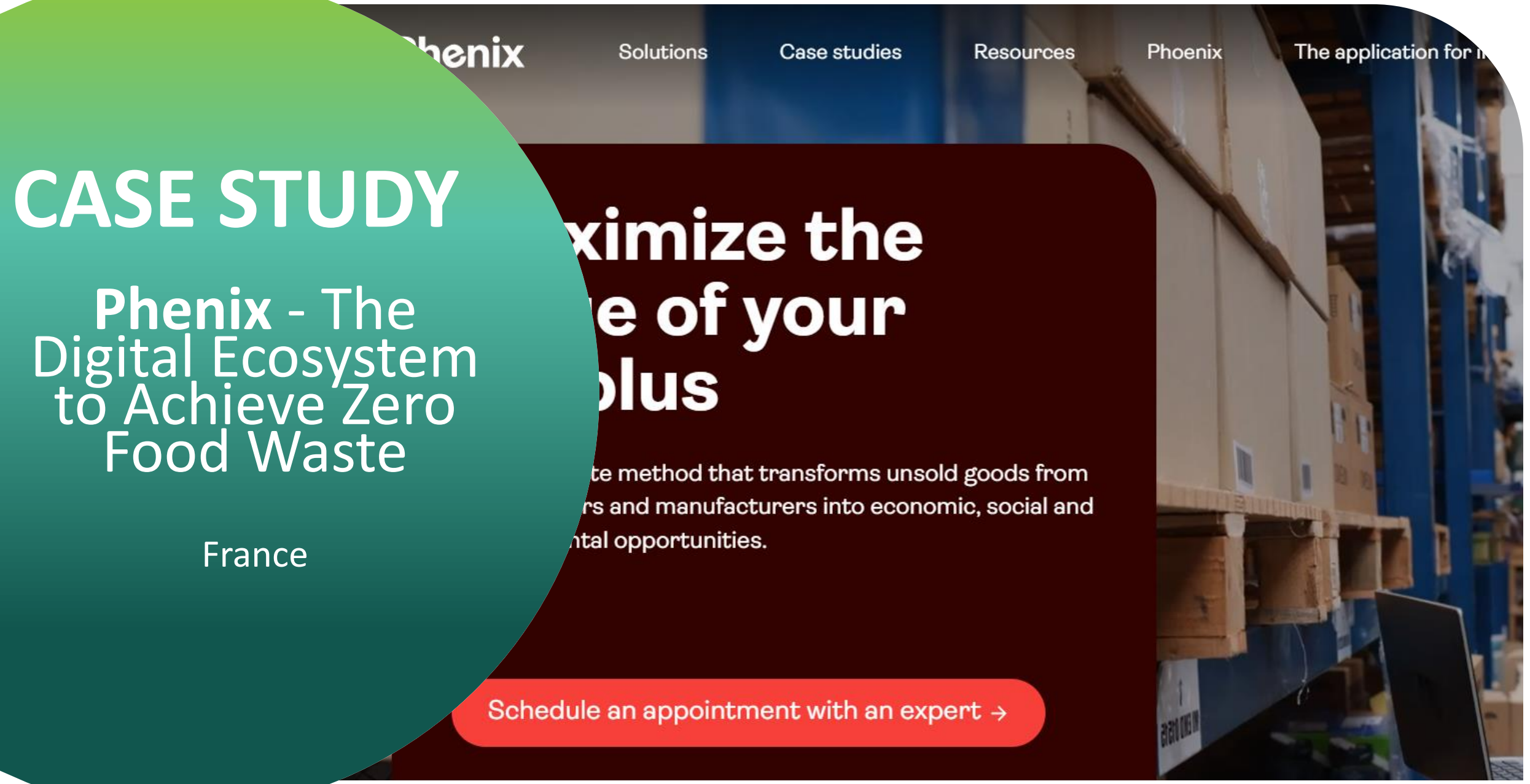
Canva – for creating simple visuals, user journeys, or mock-ups of digital features

Basic analytics tools – such as Google Analytics for tracking usage patterns in early tests

CASE STUDY

Phenix - The Digital Ecosystem to Achieve Zero Food Waste

France



Business Model: Anti-Waste as a Service

Phenix is a Paris-based French SME that uses digital tools to reduce food waste across the retail sector. As of 2025–2026, the company employs around 180–200 people, placing it within the EU definition of a **medium-sized SME (under 250 employees)**. Its platform connects supermarkets, local shops, charities, and consumers to ensure surplus food is used rather than discarded. By combining digital logistics, inventory tracking, and partnerships, Phenix helps retailers identify products approaching expiry and redirect them into alternative use streams.

The company operates as a **circular intermediary**, giving unsold food a "second life" through several channels. Surplus products can be donated to charities, sold to consumers through the Phenix mobile app as discounted "anti-waste baskets," or redirected to animal feed and composting when no longer suitable for human consumption. Phenix generates revenue through a combination of **commission on food baskets sold and subscription (SaaS) tools** that help retailers manage surplus inventory more efficiently, demonstrating how digital platforms can support circular economy solutions.

2025–2026 Impact & Strategy: Empowering the Local Circular Economy

Phenix has expanded across several European countries, including Spain, Portugal, Belgium, and Italy, showing how an SME can scale a digital solution to reduce food waste. Its platform helps retailers track surplus food and redirect it efficiently, supporting better waste management and helping businesses meet emerging sustainability requirements.

The model focuses on **prevention and reuse**, redistributing surplus food to charities or consumers before it becomes waste. By combining digital tools, data, and partnerships, Phenix enables even small local shops to manage surplus more effectively, demonstrating how SMEs can use technology to support circular economy solutions. 

Reflection and Link to Section 2

M3 Section 1 introduced the foundations of green digital entrepreneurship and explored how sustainability aims and digital tools come together to shape early business ideas.

Learners have examined real examples, explored digital tools, and mapped models using the four-point framework.

Reflection and Link to Section 2

As we move into Section 2, the focus shifts from understanding concepts to *designing* green digital business models.

Learners will explore how circular economy thinking and digital tools combine to create innovative solutions, and begin developing their own models in more detail.

Entrepreneurship Education
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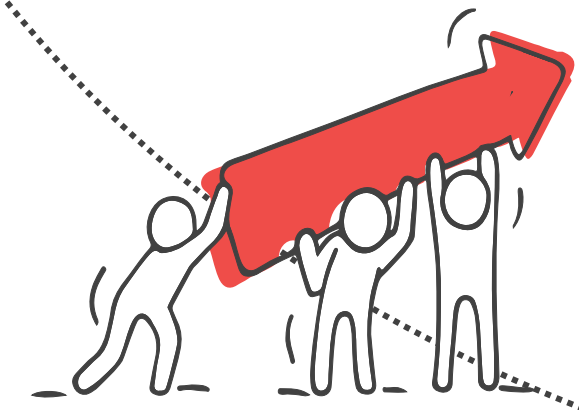
Module 3 (Part 2)

Green Digital Business Models

You have Completed… Module 3 (Part 1)



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