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D.2.1.1

Industry 5.0-based course for intermediary organizations

Lead Beneficiary: T2I

Main Author: PP06 - BAYINNO

Delivery Date: 30.01.2026

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DOCUMENT SHEET

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1. Introduction and executive summary

This deliverable, **D.2.1.1 RECENTRE Industry 5.0-based course for intermediary organizations**, presents a comprehensive summary and elaboration of the Train-the-Trainers course developed under WP2 Activity 2.1 of the RECENTRE project and held on January 21st 2026. It is designed to support intermediary organizations within the project partnership in gaining a structured and shared understanding of the RECENTRE methodology and its Industry 5.0-related components.

The course aims to ensure that all project partners apply the RECENTRE tools and methodology consistently, correctly, and confidently when working with SMEs in Pilot Actions A and B across the Alpine Space. It thereby strengthens the role of intermediary organizations as facilitators of transformation processes.

The training is primarily aimed at **intermediary organizations within the RECENTRE partnership**, including trainers and facilitators responsible for SME engagement. While participants are experienced professionals, the course addresses potential gaps in familiarity with structured tools such as SWOT analysis, Design Thinking, or Agile Sprints.

The course follows a strongly practice-oriented approach. It equips participants to facilitate comprehensive SME needs assessments, co-create actionable and realistic transition plans, and support implementation using human-centric and agile methods. By combining structured methodologies with participatory approaches, the training contributes to a **shared understanding of tools, consistent implementation across regions, and improved quality of transition plans**. Ultimately, it supports SMEs in achieving sustainable **green, digital, and human-centered transformation** within the Alpine Space. This knowledge is essential to enable intermediary organizations to provide targeted, effective, and context-specific support to SMEs.

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2. Training Focus

The training aims to equip participants with a structured understanding of the RECENTRE methodology and its integrated toolset. Participants learn how to systematically apply assessment tools, interpret results, and translate them into concrete actions. At the same time, they gain a clear view of how the different tools interact within the overall transformation process. This creates a shared methodological approach, ensures consistency, and enhances comparability across regions.

- **Supporting SMEs in the Transformation Process:** A central objective is to enable participants to guide small and medium-sized enterprises (SMEs) throughout the entire transformation journey, from initial assessment to implementation. The focus lies on structured needs analysis, prioritization of challenges, and the co-creation of realistic and feasible transition plans. A key principle of the training is that solutions must be developed collaboratively with SMEs rather than imposed externally, ensuring ownership, relevance, and long-term impact.
- **Industry 5.0 Orientation and Holistic Approach:** The training combines technological innovation with environmental and social considerations in line with Industry 5.0 principles. It addresses digital transformation as well as sustainability and emphasizes a human-centric perspective. The goal is to support SMEs in balancing technological advancement with environmental responsibility and the needs and well-being of employees.
- **Strengthening Facilitation and Implementation Skills**: In addition to methodological knowledge, the training focuses on developing facilitation and collaboration skills. Participants learn how to design and lead workshops, engage stakeholders, and support collaborative decision-making processes. This ensures that tools such as SWOT or Design Thinking are applied not only technically but as interactive and participatory approaches. At the same time, there is a strong emphasis on practical implementation: strategic insights are translated into concrete actions, implemented iteratively, and continuously adapted.
- **Impact Measurement and Continuous Improvement:** Another key focus is on assessing outcomes and impact. Participants learn how to define clear objectives and indicators, evaluate economic, social, and environmental effects, and use these insights to drive continuous improvement. This enables the

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development of evidence-based transformation strategies and demonstrates the value of implemented actions.

Overall, the training contributes to a shared methodological understanding, higher-quality transition plans, and stronger engagement from SMEs. This ultimately enables more effective and scalable Industry 5.0 transformation processes. For the agenda of the actual train the trainer, see annex.

3. Methods and Tools

The RECENTRE training provides a comprehensive set of methods and tools that support intermediary organizations in guiding SMEs through the transformation process. These tools are designed to be **practical, easy to apply, and directly linked to measurable outcomes**, ensuring usability in real SME environments. The methodology integrates five core tools, each fulfilling a specific role within the transformation process:

- **ADMA (Advanced Digital Manufacturing Assessment)**
- **SWOT Analysis**
- **Human-Centered Design / Design Thinking**
- **Agile Sprints**
- **Value Measurement (SEROI+)**

These tools are not used independently but are **interconnected components of a structured system**, enabling a stepwise progression from assessment to implementation and evaluation. All were explained and trained, see annex of this document for presentation. The RECENTRE framework combines a set of complementary methods and tools to support SMEs throughout their transformation process, from initial analysis to implementation and impact assessment.

At its core is the **ADMA** (Advanced Digital Manufacturing Assessment), which provides a structured evaluation of an SME's maturity across key dimensions such as strategy, skills, infrastructure, and collaboration. It establishes a clear baseline, identifies strengths and areas for improvement, and creates a common language for discussing transformation priorities, ensuring that all subsequent steps are grounded in objective analysis.

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Building on this foundation, the **SWOT** analysis serves as a structured approach to validate assessment results and to prioritize actions. By distinguishing between internal and external factors, it helps create a shared understanding between stakeholders and SMEs and identifies the most relevant transformation areas. Its participatory nature ensures that SME representatives are actively involved, fostering ownership and alignment.

To develop practical and user-oriented solutions, the framework integrates **Human-Centered Design and Design Thinking**. These iterative approaches focus on understanding real user needs, defining challenges, generating ideas, and continuously refining solutions through testing and feedback. This ensures that outcomes are not only technically sound but also relevant, collaborative, and adaptable to real organizational contexts.

For implementation**, Agile Sprints** provide a structured yet flexible approach to translating ideas into action. By working in short cycles with clear objectives, regular reviews, and iterative adjustments, SMEs can test solutions incrementally, reduce risks, and continuously learn and adapt. This bridges the gap between strategy and execution and promotes a pragmatic, results-oriented mindset.

The framework is complemented by the **SEROI+** methodology, which focuses on measuring the broader impact of implemented actions across social, economic, and environmental dimensions. By defining clear indicators and promoting stakeholder involvement, it supports evidence-based decision-making, transparency, and accountability while enabling continuous improvement.

To facilitate practical application, a range of **supporting resources** such as standardized templates, workshop guides, and case studies are provided. These materials simplify the use of the tools, ensure consistency across partners, and reduce complexity. They include standardized SWOT templates, Design Thinking workshop guides, Agile sprint planning templates and case studies from manufacturing and mechatronics SMEs. A defining characteristic of the RECENTRE approach is its strong focus on real-world application. All tools are designed to be used directly in SME contexts, with simplified processes and accessible language. The emphasis lies on feasible, scalable solutions that generate tangible value and measurable outcomes, ensuring that transformation efforts lead to concrete and sustainable results.

4. Conclusion

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The Train-the-Trainers course developed within the RECENTRE project provides a comprehensive, practice-oriented framework that equips intermediary organizations with the necessary competencies to support SMEs in their transition towards Industry 5.0. By combining structured methodologies with participatory and iterative approaches, the training ensures that transformation processes are not only well-planned but also feasible, context-specific, and impactful.

A key strength of the course lies in its **integrated methodological approach**, which systematically links assessment, prioritization, planning, implementation, and evaluation. This ensures that SMEs are supported across the entire transformation journey—from understanding their current maturity level to implementing and measuring concrete improvements. The clear sequencing and interaction of tools enable a transparent and traceable process, reducing ambiguity and increasing the effectiveness of interventions.

Furthermore, the training emphasizes a **strong shift in the role of intermediary organizations**. Rather than acting as traditional consultants delivering predefined solutions, participants are empowered to become facilitators of co-creation processes. This approach ensures that SMEs actively contribute to the development of their transition strategies, fostering ownership, acceptance, and long-term sustainability of implemented measures.

Another important contribution of the course is its alignment with **Industry 5.0 principles**, integrating digital innovation, environmental sustainability, and human-centered approaches. By addressing not only technological transformation but also organizational and workforce-related aspects, the training supports SMEs in achieving a balanced and resilient transformation. This holistic perspective is particularly relevant for SMEs in the Alpine Space, where resource constraints and heterogeneous starting conditions require tailored and adaptable solutions.

The focus on **practical application and feasibility** is a critical success factor. All tools and methods are designed to be directly applicable in real SME environments, with an emphasis on simplicity, clarity, and measurable value. The use of iterative methods, such as Agile Sprints and Design Thinking, allows SMEs to test solutions incrementally, reduce risks, and continuously improve their approaches based on real-world feedback.

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In addition, the integration of **value measurement approaches**, particularly through the SEROI+ framework, ensures that transformation processes are not only implemented but also systematically evaluated. This enables SMEs and intermediary organizations to demonstrate tangible economic, social, and environmental impacts, thereby strengthening accountability, transparency, and decision-making quality.

From a project perspective, the course contributes significantly to achieving the overarching objectives of RECENTRE by ensuring a **shared understanding of tools and methodology across all partners**, improving the consistency and quality of transition plans, and enhancing the effectiveness of Pilot Actions A and B. This harmonized approach is essential for ensuring comparability of results and for scaling successful practices across regions.

In conclusion, the Train-the-Trainers course represents a key building block for enabling sustainable SME transformation within the Alpine Space. It strengthens the capacities of intermediary organizations, fosters collaborative and human-centered innovation processes, and supports the development of realistic, impactful, and measurable transition pathways. By bridging the gap between strategy and implementation, the course contributes to long-term competitiveness, resilience, and sustainability of SMEs in the context of Industry 5.0.

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Annex

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Agenda - Train-the-Trainer Course: Implementing the RECENTRE Methodology

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Course OBJECTIVES

- To equip project partners and regional observers with the practical framework of the **RECENTRE Methodology for Manufacturing 5.0**.
- To review the 5 core tools, evaluation criteria, and transition plan roadmap for SMEs.

PRACTICAL INFO

- **Location / Format:** Online
- **Target Audience:** Project Partners & Observers
- **Date:** January 21, 2026
- **Time:** 14:00 – 16:00 (CET)

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COURSE AGENDA

14:00 - 14:10	**1.Introduction**	• Purpose and objectives of the training course. • Setting the context for the RECENTRE methodology
14:10 - 14:20	**2. RECENTRE Methodology Overview**	• Stepwise approach and the overall flow of activities and methods.
14:20 - 14:30	**3. RECENTRE Tools Flow**	• Strategic overview of the five core tools and their sequential implementation.
14:30 - 14:40	**4. Tool 1: ADMA & Tool 2: SWOT Analysis**	• Core purposes, methodologies, and practical applications using fictional case examples.
14:40 - 14:50	**5. Tool 3: Human-Centered Design (HCD)**	• Method and purpose for shifting focus to worker well-being; fictional case example.
14:50 - 15:05	**6. Tool 4: Agile Sprints & Tool 5: Value Sprints**	• Sprint planning frameworks, methods, and practical case run-throughs.
15:05 - 15:20	**7. Transition Plan Formulation**	• Defining core objectives, key actions, timelines, responsibilities, and the roadmap.
15:20 - 15:35	**8. Evaluation Criteria & Success Measurement**	• Breaking down KPIs, assessment methods, and tracking long-term SME success.
15:35 - 16:00	**Next Steps, Recommendations & Q&A**	• Summary, open floor discussion with partners/observers, and proposed follow-up actions for the piloting phase.

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WP2 – ACTIVITY 2.1

Train-the-Trainers Course

Applying RECENTRE Tools in SME Pilot Actions

This course ensures all RECENTRE project partners apply the project methodology and tools consistently, correctly, and confidently when working with SMEs in Pilot Actions A and B across the Alpine Space.

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Course Purpose and Positioning

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Facilitate Needs Assessments

Guide SMEs through comprehensive needs assessment processes using validated tools and frameworks.

Co-Create Transition Plans

Work alongside SMEs to develop actionable transition plans using shared RECENTRE tools and templates.

Support Pilot Implementation

Apply agile and human-centric approaches during Pilot B implementation with mechatronics and manufacturing SMEs.

The focus is not theory, but practical application of tools in real SME situations, particularly in mechatronics, manufacturing, and technology-intensive SMEs in the Alpine Space.

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Target Group and Learning Outcomes

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Who Should Attend

- RECENTRE project partners
- Trainers and facilitators for Pilot A and Pilot B

Participants are experienced professionals but not necessarily familiar with formal tools such as SWOT, Design Thinking, or Agile Sprints.

What You'll Learn

01

Explain the role of ADMA, SWOT, Human Centric Design, Value Measurement and Agile Sprints within the RECENTRE 4-step methodology

02

Guide SMEs from needs assessment to prioritized transition plans

03

Apply design thinking to human-centric, digital, and green challenges

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AGENDA

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1. **Introduction**
   - Purpose and objectives of the presentation
   - Context for RECENTRE methodology
2. **RECENTRE Methodology Overview**
   - Stepwise approach
   - Flow of activities and methods
3. **RECENTRE Tools Flow**
   - Overview of the five core tools and their sequence
4. **Tool 1: ADMA**
   - Purpose and method
   - Fictional case example demonstrating its use
5. **Tool 2: SWOT Analysis**
   - Purpose and method
   - Fictional case example
6. **Tool 3: Human-Centered Design (HCD)**
   - Purpose and method
   - Fictional case example
7. **Tool 4: Agile Sprints**
   - Purpose and method
   - Fictional case example
8. **Tool 5: Value Sprints**
   - Purpose and method
   - Fictional case example
9. **Transition Plan**
   - Objectives and key actions
   - Timeline, responsibilities, and roadmap
10. **Evaluation Criteria**
    - KPIs; assessment methods, and success measurement

Next Steps & Recommendations
- Summary and proposed Follow-up actions

RECENTRE Methodology steps

Tools to be used:

1. **ADMA Digital Maturity Scan** MANDATORY
2. **SWOT analysis** OPTIONAL
3. **Design Thinking** OPTIONAL
4. **Agile Sprints** OPTIONAL
5. **Value Measurement (eg SEROI +)** OPTIONAL

Integrating Tools: The RECENTRE Flow

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ADMA Assessment

Digital maturity baseline established

SWOT Analysis

Validates assessment data and prioritizes challenges

Transition Plan

Clear objectives and actions defined

Agile Sprints & Value Measurement

Iterative implementation and learning

Human Centered Design

Human-centric solutions co-created

Partner Role

- **Facilitation:** Guide SMEs through each tool
- **Match-making:** Connect SMEs with experts
- **Monitoring:** Track progress and adjust

Common Mistakes to Avoid

- Inventing data instead of validating
- Creating plans for SMEs instead of with them
- Pursuing perfection over feasibility
- Forgetting to link tools back to SME value

Tool 1: ADMA: Advanced Digital Manufacturing Assessment

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ADMA is a structured tool designed to evaluate the maturity of Small and Medium Enterprises (SMEs) in advanced manufacturing and digital transformation.

Strategy & Vision

Evaluates strategic planning and long-term digital transformation goals.

Skills & Capability

Assesses employee competencies and workforce readiness for advanced manufacturing.

Digital Infrastructure

Examines technology systems, connectivity, and digital capabilities.

Cooperation & Knowledge

Reviews partnerships, collaboration models, and knowledge management practices.

What is ADMA for?

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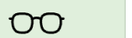
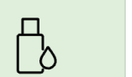


Assess Current State

Evaluate your company's technology, processes, and organizational maturity.

Identify Gaps

Discover strengths, weaknesses, and opportunities across manufacturing dimensions.



Establish Baseline

Create a foundation for planning improvement initiatives and tracking progress.

Support Decisions

Guide investments in workforce development, technology, and process optimization.

Enable Further Tools

Feed into SWOT analysis, transition planning, Human Centric Design, Agile sprints and Value Measurement.

How ADMA Helps Your Company

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Know Your Position

Understand where you stand in advanced manufacturing and digital capabilities.

Prioritize Actions

Make improvement decisions based on objective data and clear priorities.

Track Progress

Establish a baseline for measuring improvement over time.

Strengthen Capabilities

Identify where employee skills, processes, or technology need development.

Invest Smarter

Link technology adoption directly to business strategy for better ROI.

Create Shared Language

Enable clear communication across managers, workers, and partners about transformation.

How to Use ADMA

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01

Collect Data

Gather information about processes, workforce, technology, and ongoing projects.

02

Evaluate Each Dimension

Assess current reality and select maturity level (low to very high) for every ADMA area.

03

Document Projects

Record ongoing or completed initiatives that demonstrate your company's capabilities.

04

Analyze Results

Identify strengths and weaknesses. Highlight low-maturity areas for improvement.

05

Plan Actions

Feed results into SWOT analysis and create transition plan for Pilot B activities.

06

Review and Repeat

Update ADMA regularly as your company evolves—it's a living assessment.

Prioritization Framework

Translating ADMA scores into actionable transition priorities

Identify Low-Medium Maturity

Focus on ADMA dimensions at Level 2–3 where improvement potential is highest

Assess Business Impact

Evaluate which gaps create the most significant operational or competitive risk

Validate SME Feasibility

Ensure initiatives are realistic given resource constraints and organizational capacity

Selection Criteria

- Maturity level 2–3 (room for growth)
- High operational or market impact
- Achievable within SME constraints
- Measurable improvement potential

Tool 2: SWOT Analysis for SME Transition Planning

Purpose in RECENTRE

SWOT is used in Step 2 to:

- Validate assessment data (digital, green, human)
- Create shared understanding with the SME
- Prioritize transformation actions

How Partners Should Use SWOT

1. **Validate, do not invent** – use assessment data
2. **Do it with the SME**, not for the SME
3. **Select 2-3 priorities only**

#	Section	Key Points / Notes
1	Strengths	• Internal advantages • What we do well
2	Weaknesses	• Internal disadvantages • Areas for improvement
3	Opportunities	• External chances to grow • Industry trends
4	Threats	• External risks • Challenges we face

Tool 3: Human-Centered Design approach

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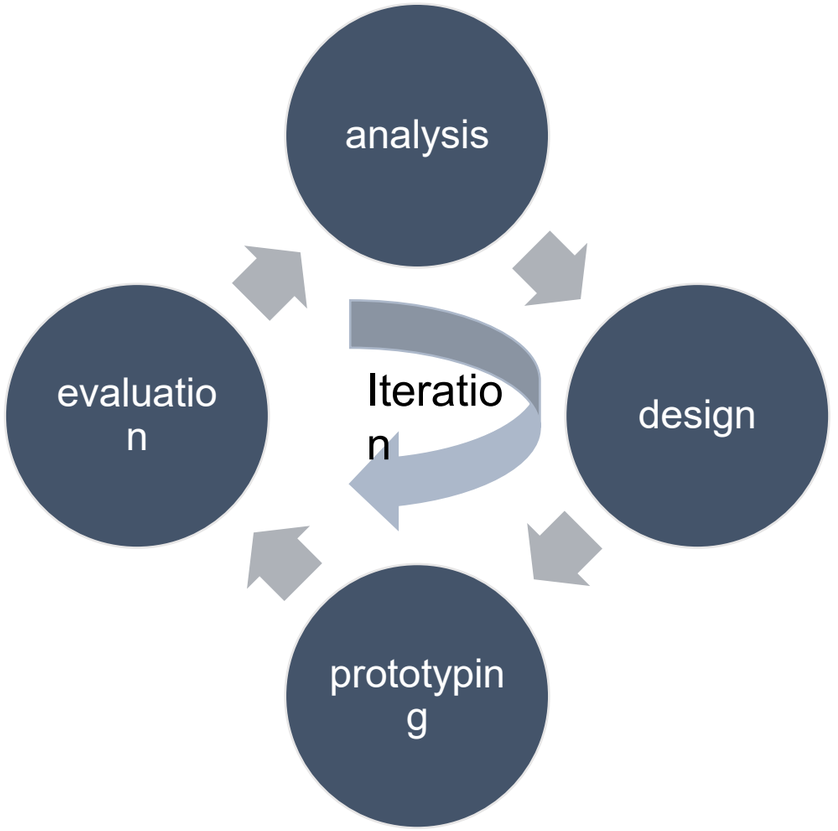
1. user/human centered design

- User Centred Design
  Iterative process
  User-centric
  The user (human) is in the focus of development, involved in all development phases, ongoing evaluation and adaptation of solutions
  Harmonization of user (expectations, wants, needs) and business constraints (time, money, resources)
  The final solution must be "good enough", it does not have to be "perfect"; except in specific cases (e.g. critical systems)



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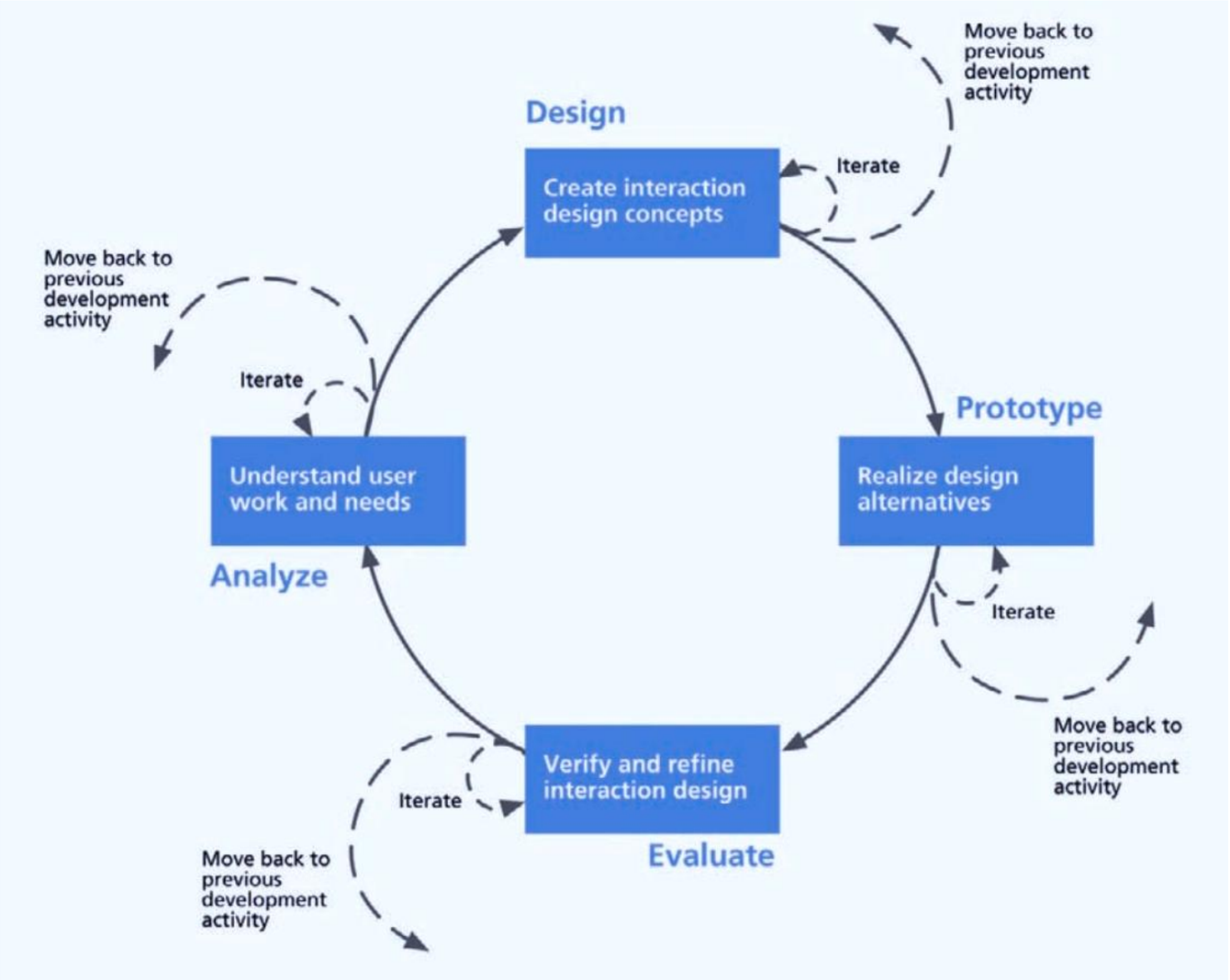

The UX Book- Process and Guidelines for Ensuring a Quality User Experience, Rex

Tool 3: Human-Centered Design approach

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2. design thinking

Design Thinking is used in Step 6 to address unclear or people-related challenges, involve workers and managers and co-create practical solutions.

Empathy

(for users and problems)

Definition

(problem)

Ideation

(generating ideas, not solutions)

Prototyping

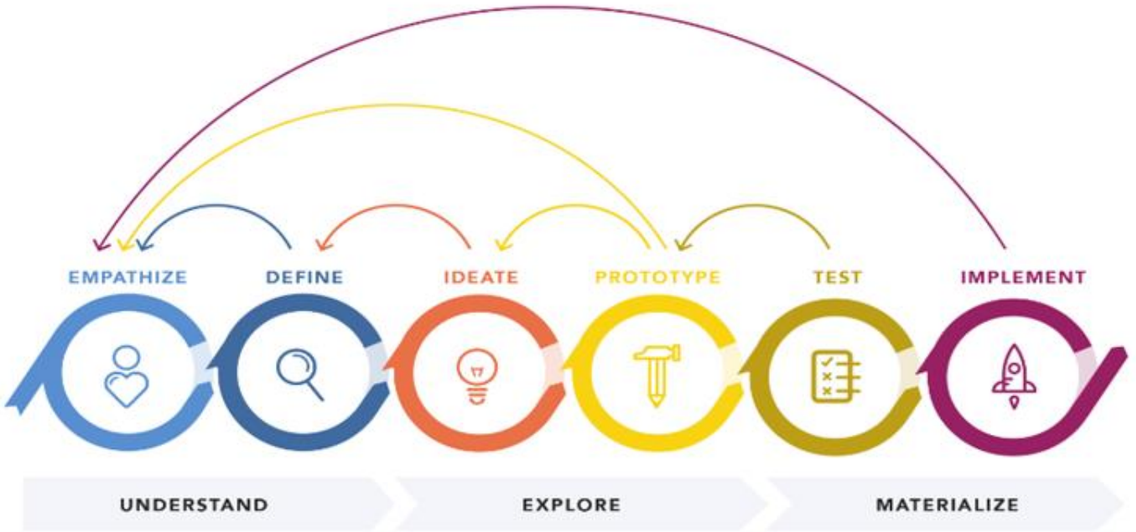
(realization of possible, but NOT final solutions)

Test

(of possible solutions)

Implementation

(final solutions to the problem)



What is Design Thinking?

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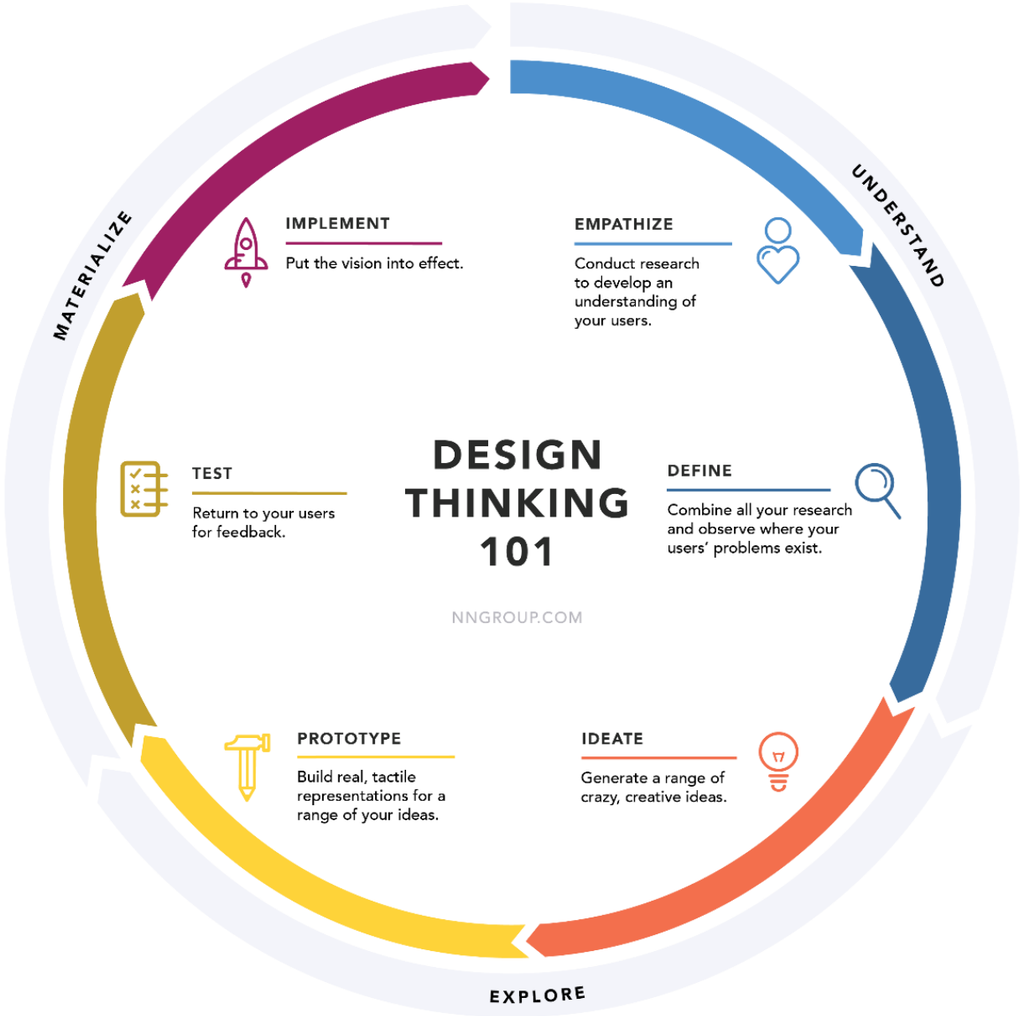
- Methodological framework or process for solving complex problems
  Highly interdisciplinary
  User (human) oriented
  Iterative, non-linear process
  Promotes innovation
  Practical-oriented
  A more in-depth understanding of the problem and needs - > redefinition of the problem
- Synthesis of knowledge and observations
- Definition of the actual problem -> problem statement Ideation (generating ideas, not solutions)
- Generating ideas, innovating, thinking outside the box



https://www.interaction-design.org/literature/topics/design-thinking
https://www.nngroup.com/articles/design-thinking-study-guide/

Tool 4: Agile Sprints for Pilot B Implementation

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Agile Sprints help SMEs implement transition plans step by step, reduce risk, and measure progress through iterative cycles.

Sprint 1 (2 weeks)

Digital Traceability Pilot

- Map current production data
- Identify missing data points

Sprint 2 (2 weeks)

Implementation Phase

- Install sensors on one production line
- Train 3 operators

Sprint 3 (2 weeks)

Testing & Refinement

- Test dashboard
- Collect feedback
- Adjust for next cycle

Sprint Template Components

- Sprint goal
- Tasks & responsibilities
- Review: what worked / what didn't
- Adjustment for next sprint

Tool 5: Value Measurement (SEROI+)

SEROI+ stands for **Socio-Economic and Environmental Return on Investment plus Open Innovation**. It's a comprehensive methodology and digital tool that empowers organizations to evaluate and design services, policies, and products with measurable impact across three critical dimensions: social, economic, and environmental.

SEROI Assessment

Measuring how initiatives deliver tangible benefits for society, the economy, and the environment through rigorous evaluation frameworks.

Open Innovation

Involving diverse stakeholders in collaborative goal-setting and co-creation processes to ensure relevance, buy-in, and real-world value.

Developed through the **Interreg Europe ERUDITE Project**, SEROI+ supports both public and private sector organizations in planning, implementing, and evaluating impactful initiatives that create lasting value for communities.

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What SEROI+ Delivers for Your Organization

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SEROI+ provides a structured approach to design effective, inclusive, and measurable services that deliver authentic value to communities and stakeholders. Here's how it supports your strategic objectives:

Plan with Purpose

- Define clear, actionable goals for services or policies
- Select measurable outcomes aligned with strategic priorities
- Bridge the gap between intended impacts and community needs

Engage Stakeholders

- Systematically map key participants and their roles
- Understand stakeholder interests, expectations, and influence
- Leverage insights to co-design better services collaboratively

Co-Create Solutions

- Identify unmet needs through collaborative ideation
- Evaluate whether services truly deliver promised value
- Validate concepts with users and implementation partners

Measure Results

- Define impacts for goals, services, and stakeholder groups
- Select robust, traceable performance indicators
- Quantify outcomes to support evidence-based decisions

Your Roadmap: The SEROI+ Four-Step Process

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While the SEROI+ platform requires login credentials, the methodology follows a proven four-phase approach. This structured and participatory process ensures projects are not only well-planned but also meaningful and measurable in real-world terms.

Define the Scope

Establish your foundation by answering critical framing questions:

- What specific outcomes do we want to achieve?
- Who are the key actors and beneficiaries involved?
- Why does this initiative matter to our stakeholders?
- Where and when will the implementation take place?

Map Stakeholders

Build a comprehensive understanding of your ecosystem:

- Identify who will be affected by the initiative
- Analyze their interests, benefits, and potential concerns
- Assess how they can contribute or influence outcomes
- Identify who will be affected by the initiative

Co-Create Services

Collaborate with stakeholders to design effective solutions:

- Surface unmet needs and emerging opportunities
- Generate and refine innovative ideas together
- Evaluate feasibility, desirability, and value of concepts

Measure Value

Establish your evaluation and reporting framework:

- Define specific impacts the initiative will generate
- Select indicators that measure those impacts reliably
- Create systems to track and communicate results

Transform Impact Assessment Into Strategic Advantage

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Comprehensive Framework

SEROI+ integrates Social, Economic, and Environmental Return on Investment with Open Innovation principles to create a holistic impact assessment approach.

Design & Assessment

Organizations gain powerful capabilities to design, assess, and continuously improve impactful services that address real community needs.

Stakeholder Engagement

The methodology embeds stakeholders throughout the journey—from initial goal setting through co-creation to final evaluation and reporting.

Structured Approach

A proven four-step process guides teams to define clear goals, map stakeholders systematically, co-design innovative services, and measure tangible value.

Ready to measure what matters? SEROI+ provides the framework, tools, and collaborative approach to transform your initiatives into measurable social, economic, and environmental impact.

Fictional Case Example: Mechatronics SME

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Company Details

Mechatronics Demo Ltd

45 employees • Small Enterprise

Ljubljana, Slovenia

Annual Turnover: ≤ EUR 2M

Core Business

Design and assembly of mechatronic sub-assemblies for automotive industry
Tier-1 and Tier-2 suppliers / OEMs

Production Model

Manual assembly with partial automation
Small to medium batch production

High quality and traceability requirements

Transformation challenge: The company wants to: - Reduce production errors - Improve worker well-being - Prepare for digital traceability requirements

Fictional Case Example: Mechatronics SME

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Business & Operational Challenges

Business Priorities

- Reduce production errors and rework
- Improve productivity without increasing worker stress
- Prepare for digital traceability requirements
- Respond to sustainability and compliance demands

Human & Organizational Issues

- Increased stress perceived by operators
- Uneven digital skills among workers
- Resistance and uncertainty about new technologies
- Rising absenteeism after recent changes

Main challenge: Production errors detected late in the process, creating pressure from OEMs on sustainability and reporting.

Fictional Case Example: Mechatronics SME

ADMA Maturity Assessment

Fictional mechatronics SME • 45 employees • Semi-automated production environment

Your average maturity score: 1.24/5

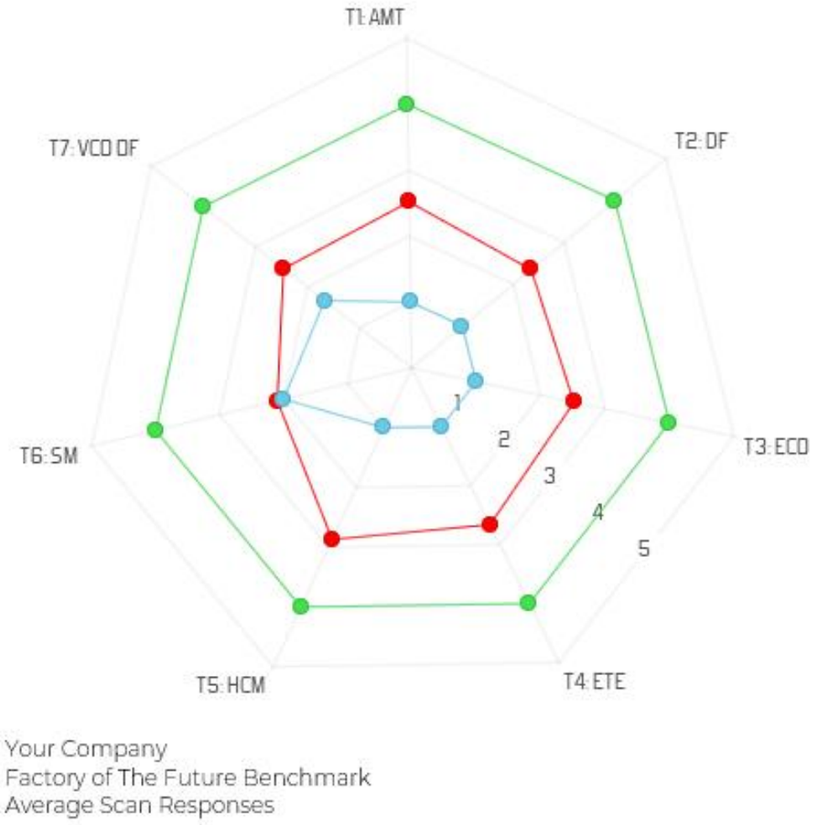
Target Score: 4/5

Current ADMA maturity: early-stage (≈ Level 1)

Highest and Lowest Scoring Transformation Areas at a Glance

The table below shows an overview of the scores for each Transformation Area based on the scan answers you have provided and how that relates to the Factory of the Future Benchmark.

	Your Score	FOF Benchmark	Gap to FoF Benchmark
T1: Advanced Manufacturing	1	4	-3
T2: Digital Factory	1	4	-3
T3: ECO Factory	1	4	-3
T4: End-to-end Customer Focused Engineering	1	4	-3
T5: Human Centred Organisation	1	4	-3
T6: Smart Manufacturing	2	4	-2
T7: Value Chain Oriented Open Factory	1.67	4	-2.33



These results show an SME at an early stage of digital and organisational maturity, which is typical for many manufacturing SMEs.

Fictional Case Example: Mechatronics SME

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ADMA Maturity Assessment – Key Gaps & Challenges

1. Operational Gaps
- Limited data integration across departments
- Inconsistent performance tracking metrics
- Manual processes leading to inefficiency

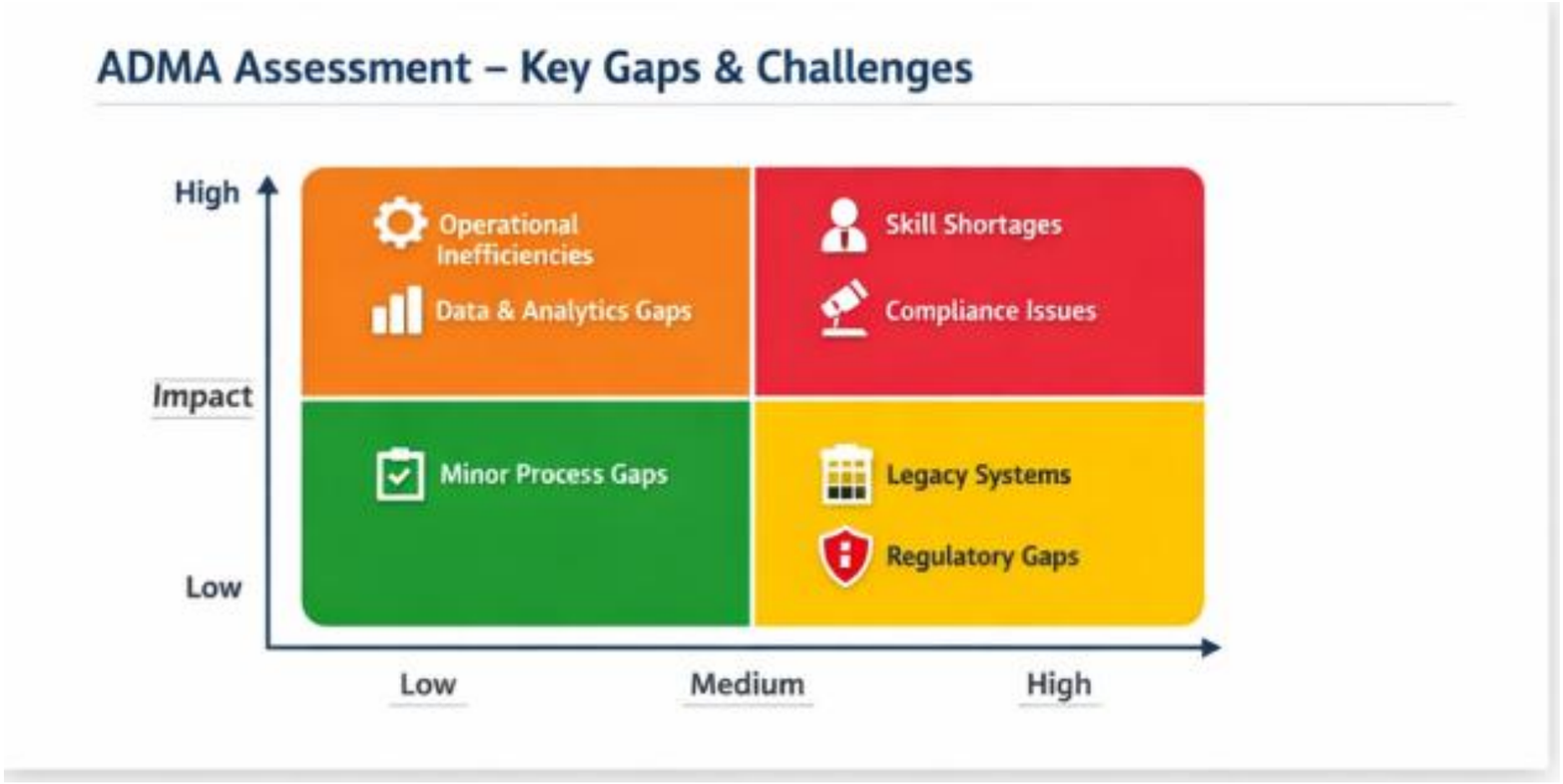
2. Strategic Gaps
- Misalignment between ADMA goals and current business objectives
- Limited stakeholder engagement in key initiatives

3. Capability & Resource Gaps
- Skill shortages in data analytics and digital tools
- Insufficient technology infrastructure

4. Compliance & Governance Challenges
- Incomplete adherence to regulatory requirements
- Gaps in risk management and reporting frameworks

Fictional Case Example: Mechatronics SME

ADMA Maturity Assessment - Key Gaps & Challenges



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Transition Plan Overview

Three objectives aligned with ADMA maturity gaps and business priorities

1

Human-Machine Performance

Improve productivity and well-being at semi-automated workstations

2

Digital Traceability

Prepare systems and processes for OEM compliance requirements

3

Internal Capability

Strengthen skills and sustain technology adoption through structured learning

ADMA Linkage

Each objective targets specific maturity dimensions, moving from Level 2–3 toward Level 3–4

Pilot B Methodology

Practical tools applied in short cycles to test, learn, and refine approaches

Phased Timing

Short-term wins build momentum for medium-term structural improvements

Framework Integration Summary

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ADMA
Defines focus areas

SWOT
Prioritizes actions

Transition Plan
Defines objectives

Pilot B
Defines methods

Result:

Evidence-based roadmap linking maturity assessment to practical, achievable improvements that strengthen both technology and organizational capability

Tool 2: SWOT Analysis: Fictional Case example

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Step 1: Fill STRENGTHS (Internal – What works well?)

Ask the SME:

- What do you do better than competitors?
- Where are you already strong according to ADMA?

Partner tip: Strengths must already exist today.

Step 2: Fill WEAKNESSES (Internal – What limits you?)

Ask the SME:

- Where do problems occur repeatedly?
- What does ADMA show as a gap?

Partner tip: Weaknesses should describe facts, not blame.

Step 3: Fill OPPORTUNITIES (External – What can you use?)

Ask the SME:

- What external trends could help you?
- What are customers asking for?

Partner tip: Opportunities are outside the company's direct control.

Step 4: Fill THREATS (External – What could harm you?)

Ask the SME:

- What external risks worry you most?
- What could block transformation?

Partner tip: Avoid listing internal problems as threats

Tool 2: SWOT Analysis: Fictional Case example

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After the table is filled:

1.Review all four boxes with the SME

2.Select 2–3 priority issues only, usually:
- Weaknesses that block opportunities
- Threats that require urgent action

3.These priorities become:
- Transformation objectives
- Actions in the transition plan

Example:

•Weakness: No real-time production data

→ **Action:** Pilot sensor-based monitoring on one assembly line

Tool 3: Human-Centered Design: Fictional Case example

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Empathize

Interviews with operators reveal poor ergonomics and unclear task division

Purpose

Understand the real experience of workers and supervisors.

Methods (simple, low cost)

- Short interviews (15–20 min)
- Workplace observation
- Informal group discussion

Who is involved

- Operators using the new workstations
- Shift leaders / supervisors
- Maintenance or process engineers

Example Findings

Workers feel constantly monitored
New interfaces are unclear
Manual + automated tasks are poorly balanced
No time allocated to learn new routines

Trainer reminder: “At this stage, we collect perceptions — not facts, not solutions.”

Tool 3: Human-Centered Design: Fictional Case example

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Define

"Operators need better interaction with automated workstations to reduce physical strain and errors"

Purpose

Turn many observations into **one or two clear problem statements**.

Trainer rule:

No solutions yet
Problems must be **human-centred**

Facilitated Activity

Ask participants:
“What makes your work harder now than before?”
“When does stress increase most?”

Example Problem Statement

“Workers experience higher stress because semi-automated workstations increase cognitive load and pace without sufficient training, clarity, or control.”

Tool 3: Human-Centered Design: Fictional Case example

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Ideate

Adjustable workstation heights, visual task guidance, daily feedback meetings

Purpose

Generate **multiple possible ways** to address the defined problem.

Rules

- No evaluation
- No technical bias
- All ideas welcome

Example ideas

- Short daily micro-training at workstation
- Adjustable work pace modes
- Visual task guidance instead of text
- Involving workers in workstation fine-tuning
- Clear “manual vs automated” task boundaries

Trainer reminder:
“Quantity over quality — we select later.”

Tool 3: Human-Centered Design: Fictional Case example

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Prototype

Paper mock-ups of workstation layout and simple visual instruction boards

Purpose

Test ideas **quickly and cheaply**.

Important rule:

“A prototype is not a final solution.”

Example Ideas:

- Paper-based visual instructions
- Temporary change in task sequencing
- One-shift pilot with adjusted pace
- Mock-up of simplified interface

Tool 3: Human-Centered Design: Fictional Case example

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Test

Pilot on one workstation for 2 weeks

Purpose

Run prototype for 1–2 weeks.

“Negative feedback is also a success — it prevents bad investments.”

Observe

- Stress indicators
- Error rates
- Worker feedback

Example Results

- Stress reduced
- Fewer interruptions
- Productivity stabilised
- Absenteeism stopped increasing

“Design Thinking is not about creativity.
It is about understanding people before changing systems.”

Tool 4: Agile Sprints: Fictional case example

Agile Sprints help SMEs implement transition plans step by step, reduce risk, and measure progress through iterative cycles.

Sprint 1 (2 weeks)

Digital Traceability Pilot

- Map current production data
- Identify missing data points

Sprint 2 (2 weeks)

Implementation Phase

- Install sensors on one production line
- Train 3 operators

Sprint 3 (2 weeks)

Testing & Refinement

- Test dashboard
- Collect feedback
- Adjust for next cycle

Sprint Template Components

- Sprint goal
- Tasks & responsibilities
- Review: what worked / what didn't
- Adjustment for next sprint

Tool 5: Value Measurement (SEROI+)

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A Slovenian SME's journey using the SEROI+ framework to navigate digital transformation while prioritizing worker wellbeing and operational excellence.

Company Profile

Mechatronics Demo Ltd is a small mechatronics manufacturer in Slovenia with 45 employees, specializing in precision assembly for OEM partners.

Critical Challenges

- Heavy reliance on manual assembly processes
- Late-stage error detection causing costly rework
- Minimal digital traceability capabilities
- Workforce stress and change resistance
- Growing OEM quality and sustainability requirements

Strategic Objective

Deploy the **SEROI+ framework** to guide a structured, human-centered digital transformation that balances technological advancement with employee wellbeing and sustainable business growth.

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PHASE 1

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Defining Scope & Engaging Stakeholders

The foundation of successful transformation begins with clear boundaries and inclusive stakeholder engagement. SEROI+ emphasizes structured planning before implementation.

Pilot Scope

One semi-automated assembly line involving 15 operators over a 6-month implementation period

Core Objectives

- Minimize production errors and rework
- Boost productivity sustainably
- Enable traceability and reporting

Stakeholder Map

- Assembly line operators
- Production & quality managers
- Senior leadership team
- OEM customer partners

SEROI+ Principle: Worker involvement from day one is the critical success factor. Digital transformation fails when it's done *to* people rather than *with* them.

PHASE 2

Understanding Needs & Co-Creating Solutions

Through collaborative workshops and frontline engagement, the team identified real pain points and co-designed practical digital solutions tailored to daily operations.

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Stakeholder Needs

- **Earlier Error Detection**
  Catch quality issues at the source, not at final inspection
- **Simplified Digital Tools**
  Intuitive interfaces that don't require extensive IT knowledge
- **Reduced Administrative Burden**
  Eliminate redundant paperwork and manual data entry
- **Transparent Communication**
  Clear explanation of changes and their benefits

Co-Created Solutions

1

Digital Work Instructions

Step-by-step visual guides displayed at each workstation, replacing paper manuals

2

Barcode Traceability System

Simple scanning workflow to track components and assemblies throughout production

3

Real-Time Visual Dashboards

Live quality and productivity metrics visible to operators

4

Targeted Skills Training

Short, practical digital skills sessions integrated into work schedules

PHASE 3

Measuring Multidimensional Impact

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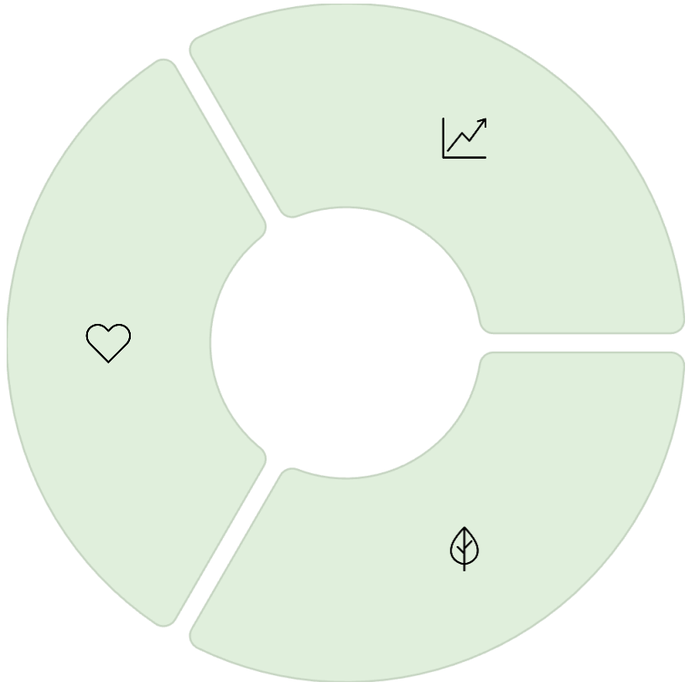
SEROI+ goes beyond traditional ROI by measuring social, economic, and environmental outcomes. This holistic approach reveals the true value of human-centered digital transformation.

Social Impact

Focus areas: Reduced workplace stress, increased employee engagement, enhanced digital competency
Key indicators: Absenteeism rates, worker satisfaction surveys, skills assessment scores



Economic Impact

Focus areas: Lower rework costs, improved line productivity, reduced scrap waste
Key indicators: Error and defect rates, units per shift, cost of quality metrics

Environmental Impact

Focus areas: Material waste reduction, paper elimination, energy efficiency gains
Key indicators: Scrap volume, paper consumption, energy usage per unit produced

This comprehensive measurement framework enables data-driven decision-making and transparent stakeholder reporting, building credibility with OEM partners and supporting sustainability commitments.

Pilot Results & SEROI+ Value Proposition

The 6-month pilot demonstrated measurable improvements across all impact dimensions, validating the SEROI+ approach for SME digital transformation.

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35%

Error Reduction

Fewer production defects through early detection and visual guidance

22%

Productivity Gain

Increased output per shift without extending working hours

85%

Worker Acceptance

High adoption rate of digital tools among operators

40%

Scrap Reduction

Less material waste through better quality control

Why SEROI+ Delivers for SMEs

Structured Methodology

Step-by-step framework reduces complexity and provides clear roadmap

Human-Centered Design

Worker wellbeing and engagement drive sustainable adoption

Risk Mitigation

Pilot approach tests solutions before full-scale investment

Measurable Outcomes

Clear metrics support decision-making and stakeholder communication

Competitive Advantage

Enhanced traceability and sustainability capabilities meet OEM requirements

Bottom line: SEROI+ enabled Mechatronics Demo Ltd to achieve digital transformation that improves business performance while respecting and empowering their workforce—a blueprint for sustainable SME growth.

Transition Plan

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The Transition Plan is a short and practical document that translates **analysis into action**.

It takes:

- **ADMA results** (current maturity)
- **SWOT priorities** (what really matters)

and turns them into **clear, realistic improvement objectives and actions**.

What it is

- A **bridge** between assessment and implementation
- A **shared reference** for SMEs and support partners
- A **structured input** for Pilot B activities

BARBARA/STEFAN

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What is the Transition Plan for?

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The Transition Plan is used to:

- Convert **ADMA insights** into **actionable priorities**
- Focus efforts on **2–3 realistic improvement areas**
- Align **people, processes, and technology**
- Avoid over-complexity and unfocused initiatives
- Prepare a **clear starting point for Pilot B tools**
  - Design Thinking
  - Agile sprints
  - Value Measurement

BARBARA/STEFAN

In the RECENTRE process

01

ADMA

establishes the baseline

02

SWOT

prioritises challenges

03

Transition Plan (Pilot A)

defines objectives and actions

04

Pilot B

tests and implements solutions

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Transition Plan – Objectives & Actions

Evaluation process

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For the sake of avoiding any bias, transition plans will be exchanged throughout the RECENTRE partnership. No partner will evaluate “its own” transition plans.

(1) Transition Plan production

until End of May 2026

- Results of appointments with SMEs
- Also: Fill out SWOT analysis template

(2) Evaluation by partner

Summer, until Step (3)

- Swapping of transition plans
- Choosing five best per pilot area with the help of internal or external experts

(3) Joint evaluation confirmation meeting

Before summer break

- Mobilizing Advisory Board
- Agreement on full list
- After that: Communication to chosen companies: Pilot B starts September

Key points: From Pilot A to Pilot B

- Transition plan is to be seen as strategy document, collection of ideas, assessment of company status and basis for evaluation at the same time
- Five highest-scoring transition plans based on the scoring methodology will be chosen in each pilot area
- Funding will go directly from partner budgets to the external experts - not to companies
- Funding use will be checked by partners handing in template on money use and listing external and internal experts in order to fill 10.000 € for each company

ADMA Translation into Scoring

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How to proceed

Transition Plan: ADMA section

Not the full scan is asked, but rather a scale of 1-10 assessment of selected factors of the methodology which will be decided on out of the conversation with the company representative.

IMPORTANT: Two numbers will be decided on for each factor (NOW and AFTER) fictional transition implementation.

Evaluation template: ADMA score

The DIFFERENCE between these overall scores will be translated into the level of ambition of the transition plan (more difference between "now" and "then" → higher score).

Overall result: ADMA integration

Multiplication effect: Not the current low or high transition readiness is key - but transformation ambition.

Key reasons for proposed application of ADMA

- **Time: Overseeable effort, coupled with other questions**
- **Understanding: Using the fitting aspects of ADMA only**
- **ADMA plays the most important, but not the only role**
- **Making tools applied relevant for all call companies**

Evaluation Factor	Reasoning (optional)	Score (1-5)
ADMA Quick-Scan Insights – transformation readiness *(Score referring to expected positive change in ADMA score, regarding ambition, impact for the company, innovation and considering relation to regional standards)*		*Rated X3, 15 points attainable* *Score 1: 0-5 ADMA change* *Score 2: 5-10 ADMA change* *Score 3: 10-15 ADMA change* *Score 4: 15-20 ADMA change* *Score 5: 20 or more ADMA change*

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Evaluation Criteria

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ADMA result

Weighed three times as much as other factors, representing ambition in the projected change of the ADMA score after project completion

Feasibility of the Transition Plan

Distinguished by three different subfactors: Management readiness, team readiness, resource availability

RECENTRE Transition priority factors

Distinguished by the RECENTRE priorities green, digital and human-centric transition as individual scoring factors

Individual factors

Three individual closing factors: ecosystem impact, realistic KPIs and observation, ethical conformity as non-numeric factor

Evaluation is being explained in the opening section of the Pilot B Evaluation Template.

A total of 55 points is attainable, with the ADMA result being the only one with an alternate (3x, 15 out of 55) weight in the process.

Tools and Resources Provided

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SWOT Template

RECENTRE-aligned template for consistent needs assessment and prioritization across all partner regions

Design Thinking Workshop Guide

Step-by-step facilitation guide for running human-centric co-creation sessions with SMEs and their teams

Agile Sprint Planning Template

Structured template for planning, executing, and reviewing iterative implementation cycles during Pilot B

Case Descriptions

Real project cases from mechatronics and manufacturing SMEs for reuse in training and facilitation

All tools are designed for simplicity and practical application. Keep language simple, focus on feasibility over perfection, and always link tools back to SME value.

Expected Outcomes and Key Messages

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Expected Outcomes of Activity 2.1

Shared Understanding

Common knowledge of tools across all partners

Consistent Application

Uniform methodology in Pilot A and Pilot B

Higher Quality Plans

Better transition plans across regions

Implementation Success

Improved SME engagement and outcomes

Key Messages for Trainers

Tools are means, not ends

Keep language simple

Focus on feasibility, not perfection

Always link tools back to SME value

This course directly supports the implementation of the RECENTRE methodology and ensures methodological coherence across all project regions, enabling successful digital and green transformation of SMEs in the Alpine Space.

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Resources

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- https://www.nngroup.com/
- https://www.designcouncil.org.uk/search/?tx_kesearch_pi1%5Bsword%5D=double+diamond
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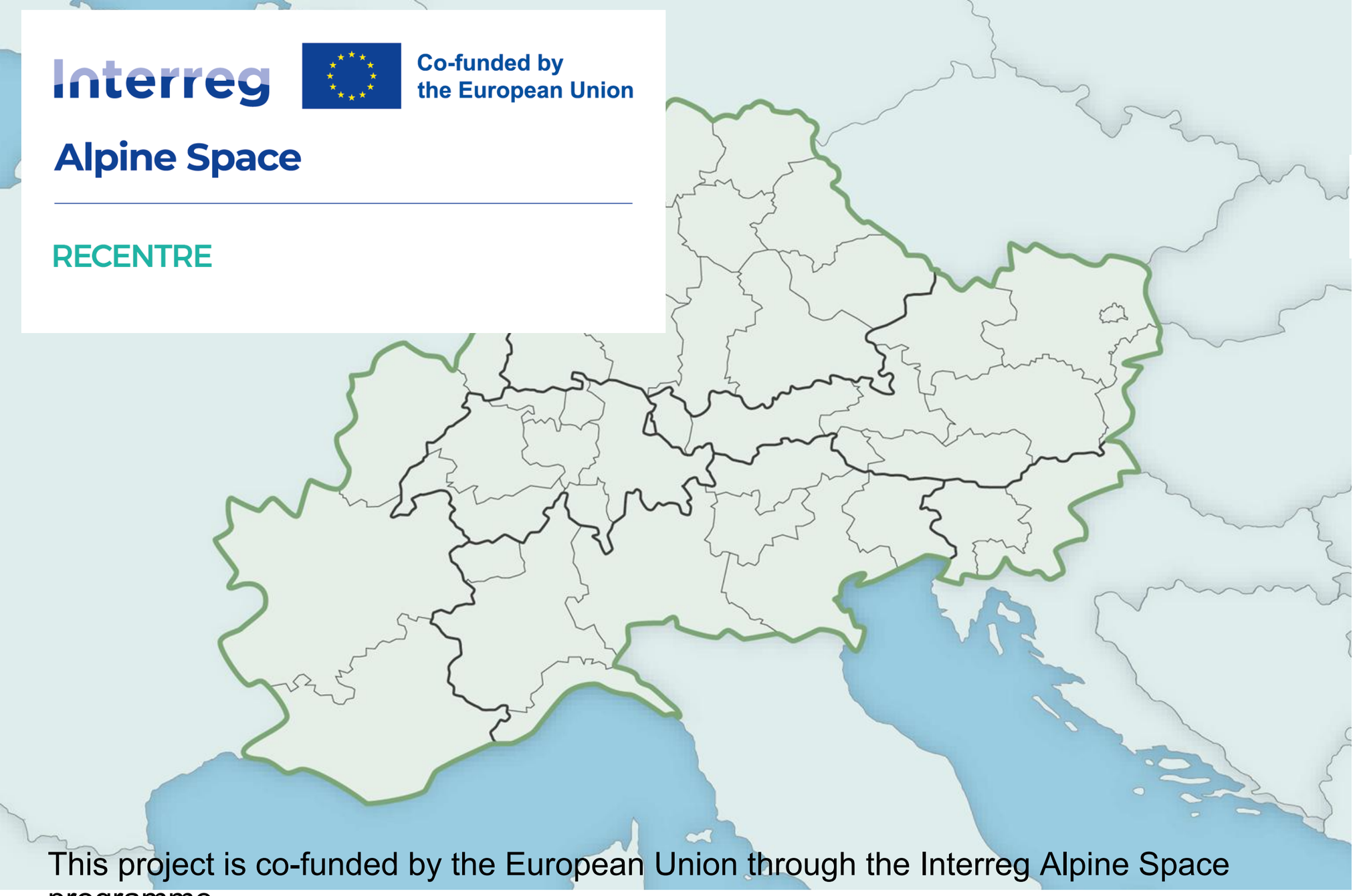

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Contact:

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Other examples

PRIORITY 1

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Human-Machine Interaction

Addressing the disconnect between automation investment and workforce performance

ADMA Evidence

Advanced Manufacturing Level 3

Semi-automation functional

Human-Centered Org Level 2

Adoption challenges

Observed Issues

- **Productivity plateau:** Output stagnant despite automation
- **Suboptimal interfaces:** Workstations not designed with operator input
- **Worker stress:** Elevated absenteeism and disengagement
- **Error patterns:** Recurring quality issues at semi-automated cells

Root Cause: Technology implemented without co-design with operators. Human factors and ergonomics were secondary considerations rather than core design principles.

PRIORITY 2

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Digital Traceability & Data Utilization

Responding to OEM requirements and unlocking value from existing data

ADMA Evidence

40%

Digital Capabilities
Level 2 • Limited integration

50 %

Vision & Strategy

Level 2–3 • Partial roadmap

Observed Issues

→ **OEM pressure increasing:** Supply chain partners demanding full traceability compliance

→ **Data exists but disconnected:** Multiple systems capture information without integration

→ **No decision support:** Rich data generated but not analyzed or acted upon

→ **Competitive risk:** Inability to meet traceability requirements could cost contracts

> "We have the data. We just can't connect it, report it, or use it to improve operations."
>
> — Operations Manager

PRIORITY 3

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Skills Development & Technology Adoption

Building internal capability to sustain and scale improvements

ADMA Evidence

Organization & Skills: Level 2

Training reactive and supplier-dependent

Observed Issues

- Training only when new equipment arrives
- No systematic capability development
- Knowledge remains with individuals, not organization
- Limited internal problem-solving capacity

Current State

Supplier-driven, equipment-focused, one-time events

Target State

Internal capability, continuous learning, knowledge capture

Guiding Principle: Only ADMA-validated priorities with clear maturity gaps and business impact advance to the Transition Plan. This ensures focus and resource alignment.

OBJECTIVE 1

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Improve Workstation Performance & Well-Being

Target ADMA Progression

1

Human-Centered Organization
Level 2 → Level 3
From awareness to systematic operator involvement

2

Advanced Manufacturing
Level 3 → Level 4
From functional to optimized automation

Planned Actions

- Co-create improvements with operators through structured workshops
- Map stress points, error sources, and ergonomic issues
- Prototype alternative layouts using low-cost mockups
- Test modifications in live production with rapid feedback loops

Pilot B Tool

Design Thinking

Empathize • Define • Ideate • Prototype • Test

Timeline

Short-term (0–3 months)

Quick wins to build confidence and demonstrate value

OBJECTIVE 2

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Prepare for Digital Traceability Requirements

1 — Gap Analysis
Map current traceability capabilities against OEM requirements

2 — Minimum Viable Dataset
Define essential data points for compliance and operational value

3 — Pilot Implementation
Test traceability on one product line before scaling

Target ADMA Progression

Digital Capabilities
L2 → L3
Connected systems

Vision & Strategy
L2–3 → L3
Clear digital roadmap

Pilot B Approach

Agile Sprint Methodology

- 2-week rapid iteration cycles
- Cross-functional sprint team
- Daily standups and sprint reviews
- Fail fast, learn quickly mindset

Timing: Medium-term (3–6 months)

OBJECTIVE 3

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Strengthen Internal Skills & Adoption

Target ADMA Progression

Level 2
Ad hoc training

Level 3
Structured learning

Target
Continuous capability building

Key Actions

- **Targeted operator sessions:**

  Short, focused training aligned with pilot objectives
- **Peer learning integration:**

  Operators teach operators during pilot activities
- **Knowledge capture:**

  Document lessons learned in accessible, visual formats
- **Coaching support:**

  Embedded guidance during transition implementation

Tool 2: SWOT Analysis: Fictional Case example

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After the table is filled:

1.Review all four boxes with the SME

2.Select 2–3 priority issues only, usually:

- Weaknesses that block opportunities
- Threats that require urgent action

3.These priorities become:

- Transformation objectives
- Actions in the transition plan

Example:

•Weakness: No real-time production data

→ **Action:** Pilot sensor-based monitoring on one assembly line

Strengths

- Skilled technicians
- Stable client base
- Existing basic automation

Weaknesses

- No real-time production data
- High dependency on key workers
- Limited digital skills

Opportunities

- Customer demand for digital traceability
- Available funding for digitization
- Worker interest in upskilling

Threats

- Rising energy costs
- Increasing quality requirements
- Workforce aging

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Workflow for Pilot A

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1. Registration (Inbound)

- The SME submit their interest via the official **Online Form** (Expression of Interest).
- *Goal:* Formal capture of contact details and initial motivation.

2. Active Monitoring & Contact

- Regularly check survey/form results (e.g., weekly).
- Promptly contact the SME (email or phone) to acknowledge receipt and confirm interest.

3. Screening / Pre-Check (Optional)

- If necessary, conduct a short phone call to clarify details.
- *Check:* Does the company fit the target group (Manufacturing/Mechatronics, Bioeconomy etc.)

4. Scheduling

- Agree on a date for the **Transition Plan creation**.
- Send preparation materials (e.g., ADMA scan link if required beforehand).

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Workflow for Pilot A

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5. The “Workshop” (Transition Plan Creation)

- **Format:** On-site (preferred) or Online.
- **Action:** **Co-create** the Transition Plan using the RECENTRE tools (SWOT, Objectives, Actions).
- **Output:** A finalized and signed Transition Plan.

6. Outlook & Timeline

- Inform the SME about the subsequent steps immediately after the workshop.
- **Transparency:** Clarify that submission does not guarantee Pilot B (competitive selection).
- **Deadline:** Inform them that feedback on the selection/evaluation will be provided

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Workflow for Pilot A

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7. Standardized Evaluation

- The Partner analyzes the Transition Plan using the internal **Evaluation Form**.
- *Key Output:* Create comparable, concise **Data Sheets (One-Pagers)** for the rating process. This ensures the board can review candidates efficiently.

8. Selection (Advisory Board)

- Review of the Data Sheets by the Advisory Board.
- Selection of the top SMEs based on objective criteria (Impact, Feasibility, Green/Digital Gap).

9. Kick-off Pilot B

- Notification of the selected SMEs.
- Start of the **Matchmaking Process** with experts.
- Official launch of Pilot B implementation.

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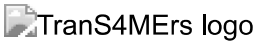
ADMA TranS4MErs Scan

Fields marked with * are mandatory.

European Advanced Manufacturing Support Centre - Scan



Welcome to the **Advanced Manufacturing** maturity scan, which is part of a comprehensive Europe-wide methodology for assisting companies in their transformation towards becoming a factory of the future. By that we mean companies that can embrace the digital, ecological and societal challenges and be competitive. The process to reach that goal we call the **Transformation Journey**.

The first step in transformation is taking this scan, which is a questionnaire that uncovers strengths and weaknesses in 7 areas related to advanced manufacturing:

T1 Advanced Manufacturing Technologies
T2 Digital Factory
T3 ECO Factory
T4 End-to-end Customer Focused Engineering
T5 Human Centred Organisation
T6 Smart Manufacturing
T7 Value Chain Oriented Open Factory

These transformation areas constitute a framework for the analysis of the current situation and planned development of your **manufacturing operations**. All transformation areas are equally important.

For each of the areas you are asked 2-4 questions, that are to be rated on a scale from 1 to 5. It may take approximately 45-60 minutes to rate the 22 questions.

Please take your time filling out the scan as truthfully/honestly as possible. You will receive a short report within 90 minutes after submitting the scan.
On the **xChange platform**, you can apply for a connection to a TranS4MEr. This is a key person who assists SMEs on their transformation journey. Before taking the scan, please ensure that you have registered on the xChange platform, as this is how you will receive your results.

Good luck,
The ADMA TranS4MErs Project Team

You may already have come across the Digital Maturity scan or other questionnaires, that aims to give an overview of the digital and/or innovation maturity across the whole company including product development, sales etc. This scan focusses on one area of the company, namely the manufacturing area, where we get a step deeper and ask you questions on a process level. To benefit from the scan result, your company should be characterized by the following criteria:

- Basic lean principles are already applied
- CEO has a demonstrated innovation mindset
- First innovation breakthroughs have already been realized
- Customers are asking the company to move towards smaller lot sizes
- The company's management team is fully committed and engaged

After completing the scan, you can get the help of a local advisor, our 'TranS4MErs', near you in your region.

Please take your time filling out the scan. The scan is intended to reflect your company's current situation towards becoming a Factory of the Future.

*Personal Data Protection

On behalf of the European Commission, the ADMA TranS4MErs project team will process the results of the survey only in order to draft a report. Your privacy, personal and company data protection will be guaranteed in conformity with the European Regulation (EU)2018/1725. Your data will be processed in a separate database from the results of the survey in order to guarantee the anonymity of the survey and will not link your data with other databases. For more information regarding the processing of your data, you can read the privacy policy https://ec.europa.eu/info/privacy-policy_en or contact us via info@trans4mers.eu

☑ Agree

This project has received funding from the European Union's H2020-2018-2020 research and innovation programme under grant agreement No 101037866.

Transformation 1 – Advanced Manufacturing Technologies

This transformation is based on deploying state-of-the-art manufacturing devices and technologies. Given the relatively high wage level, European manufacturing SMEs cannot afford to use machinery that is outdated and, therefore, hampers productivity. Factories of the Future develop their own devices for key components in production, resulting in production machinery that is highly competitive and globally unique.

Vision

Within a Factory of the Future there is a clear vision on how technology is to be used for gaining a competitive advantage. The vision is translated into a roadmap or strategic plan.

Strategy:

Is a clear investment policy that matches the strategic vision put into practice?

- Out-of-date machines are replaced ad hoc.
- An investment plan for replacing out-of-date machines exists.
- A detailed multiyear investment plan exists for the introduction of state-of-the-art technologies.
- The company's technology roadmap includes multiyear investment plans as well as the evaluation of new technologies through feasibility studies.
- The company's technology roadmap includes a research and development approach for advancement of relevant technologies to higher maturity levels.

Level of Capabilities

A Factory of the Future has the capability to introduce and operationalise advanced manufacturing technologies.

Employees:

How does your company ensure that its employees are qualified to handle advanced manufacturing technologies?

- Trainings are being organised by technology suppliers for new individual employees.
- The company organises annually update trainings for machine operators.
- In order to optimize technology usage the company organises trainings for all individual employees at regular intervals.
- The company supports individual employees in achieving expertise levels to enable them to implement process improvements themselves.
- Individual employees achieve expertise levels enabling them to fully cope with new technologies.

Level of Implementation

A Factory of the Future has a maintenance plan for advanced manufacturing technologies.

Maintenance:

Does the maintenance strategy enable high levels of Overall Equipment Effectiveness (OEE)?

- Reactive maintenance is being effectuated.
- A preventive maintenance plan follows fixed time schedules.
- Maintenance is managed based on current technology usage, eg interventions at pre-determined equipment usage levels.
- Predictive maintenance is being executed through productivity measurement at pre-determined equipment usage levels making sure interventions are only done if needed.
- An intelligent maintenance plan is based on real-time monitoring of critical components, enabling focussed interventions at the moment of potential productivity loss.

Did you already realise projects or deliverables in context of this transformation area?

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Yes, some projects have been initiated, but mainly ad hoc and limited in scope
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Transformation 2 – Digital Factory

Companies use digital technology to transform the development of products and/or processes into physical products, systems or services.

All employees are supported by digital and integrated processes. The integrated control of the digital information flow ensures the simulation of virtual scenarios before the actual implementation of the activities.

The digital factory guarantees the accuracy of the data at all times. Each data element is entered into the system only once and all other systems automatically retrieve the data element to create new information, a so-called Single Source of Truth.

Enabling infrastructure

The company has a flexible and secure ICT infrastructure, enabling the digital transformation.

Connected shop floor:

Are the equipment at the shop floor connected to a network to enable data exchange?

- Machines and other shop floor entities mainly act as stand-alone systems and are not connected to a network. Data (if any) is transferred using intermediate hardware, like a memory stick, flash card memory, etc..
- Some equipment is connected to a company network. Data is transferred manually to or from the equipment (e.g. programs can be transferred to the machine over the network, but the transfer itself is most often initiated manually).
- Equipment is connected to a company network providing access to the most important information and enabling the transfer of information to and from the machine. Important legacy equipment is digitally enabled through a connectivity module and/or digital identification tags.
- All vital equipment is connected and intelligence is added through the integration of sensors, gateways, etc. The exchange of data between machines and other shop floor entities is carried out via the network through middleware and/or MES systems.
- All shop floor entities are smart and connected in an open way and autonomously share information. Data communication is carried out via standardised and open data structures. Any entity can connect to any other entity if desired or required.

Secure digital infrastructure:

Do security information and event management systems safeguard a continuous and smooth manufacturing operation?

- The organisation manages individual security updates of some devices, but is unaware of the overall (cyber) security status of every device, access point, etc. The organisation has not yet put in place measures to protect the digital and physical security of its infrastructure and production system and is therefore vulnerable to attacks.
- The organisation complies with existing industry and security standards Responsibility lies mainly within the ICT department and reviews of policies, procedures and third-party risk assessments happen occasionally. As the organisation is unprepared, breaches go largely unnoticed.

- The organisation is aware that data are to be considered an important asset that has to be protected and for which trusted data exchange systems need to be ensured. The organisation defends itself by deploying cybersecurity technology, such as gateways, firewalls, DMZ setups, ACM and/or anti-malware protection. The ICT department is still responsible, but periodically also third-party risk assessments are executed.
- The organisation has put in place a comprehensive Security Information and Event Management system, seeking to avoid attacks. Management understands the importance of cybersecurity and the need for a dedicated policy with regular reviews. The ICT department focuses on the critical day-to-day operation of the network, and third parties are approached to take over some of the security responsibilities when appropriate.
- The organisation has a system to detect anomalies and breaches, as well as a threat intelligence system, feeding back information to other operative elements in place. Management is largely involved. Reviews and risk assessments are ongoing, with third-party expertise alleviating the security workload of the ICT team where needed.

Digital capabilities

Aside from having digital capabilities to optimise production with process data, the company also translated a clear vision on digitisation into a roadmap or strategic plan.

Transparent view on shop floor status:

How is your company using real-time production data for optimisation and decision making?

- There is no transparent view on the actual shop floor status. Specific (manual) effort must be taken to find out what is happening. Procedures and digital data are hardly in place to facilitate this process.
- The most important processes are monitored on paper and/or digitally and the data is stored on a periodic basis.. People are able to find out what is happening in production but accessing and assembling this information delay appropriate actions and countermeasures to a large extent. The company's ICT systems are not always coupled, requiring manual combination of data from different sources.
- Up-to-date information is available and visualised through production dashboard. Employees are involved in a timely fashion if e.g. a machine breaks down in production.
- Production data is used for ad-hoc analytics to support decisions. Some analytics might be integrated in decision support systems for e.g. predictive maintenance. Remote monitoring of equipment is implemented enabling machines to automatically notify personnel when there is an issue. The company has executed first experiments around data analytics and automated decision making through Machine Learning and Artificial Intelligence is being implemented.
- Data analytics are integrated within decision support systems and automated decision making through Machine Learning and Artificial Intelligence is being implemented.

Mastering the digital transformation:

Is the digital transformation managed as part of the company's DNA?

- The digital transition happens on an ad-hoc basis and is not managed. This typically causes loose ends or uncoordinated developments like data that might be available but is not used, operators that are not properly trained for the digital enabled equipment, etc.).
- The organisation is convinced of the importance of a digital transformation. Some aspects of the digital transformation are managed. However, a digital roadmap linking all elements and guiding the transition is not yet available.

- ○ The organisation has defined a shared vision for digitisation and is convinced of the need for a well-managed transition. Information and knowledge is being gathered in order to define a roadmap for the digital transformation.
- ○ The organisation has a clear roadmap for the digitisation process and has defined the required expertise/capabilities, priorities, responsibilities, etc. Core teams are formed for the roll-out and progress is continuously monitored. External expertise is called upon when needed.
- ○ The organisation has a well-managed digital transformation in place. A large part has already been digitised and a system for continuous digital knowledge acquisition is in place. The digital transformation and all its aspects are part of the company's organisational and cultural DNA.

Did you already realise projects or deliverables in context of this transformation area?

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yes, some projects have been initiated, but mainly ad hoc and limited in scope.
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Transformation 3 – ECO Factory

Being a front-runner in eco-production offers companies advantages such as cost reduction, risk reduction in raw material and energy supply, as well as in terms of a company's social responsibility image. Sustainable production includes a resilient production system based on the availability of raw materials and auxiliary materials. These systems are capable of closing the material cycle in order to optimize the efficiency of raw material usage.

The production system is aimed at a drastic reduction in energy consumption and the use of renewable energy sources.

Companies are well attuned to the significance of the environmental impact of their activities and are constantly searching for ways to reduce the ecological footprint of their processes, products and services.

Resource management

The company systematically reduces its dependency on non-renewable energy sources, raw and auxiliary materials as well as water.

Materials usage:

How is your company using product and manufacturing optimisation to reduce its raw material consumption?

- ◉ Several incremental material consumption improvement actions have been implemented.
- ○ Project-driven material usage improvements of the most relevant products and manufacturing processes have been implemented.
- ○ The company has set specific objectives and implements a methodological approach covering the transformation of materials consumption at machine, process and factory level.
- ○ The company draws upon the best available technologies to reduce the material usage of machines, processes, products and methods.

- ○ Systems capable of closing the material cycle in order to optimize the efficiency of raw material usage (also called Circular Economy principles) have been implemented through strategic and stable partnerships with customers, suppliers and other key experts.

Compliance & Innovation

A resilient and robust organisation successfully withstands the impact of climate change and resource depletion.

Rules, regulation & standards:

How actively does your company drive development of new rules, regulations and standards?

- ◉ Products and internal processes comply with existing rules and regulations.
- ○ The company as well as its supply chain is compliant with existing rules and regulations.
- ○ The company applies effective and timely methods for integrating new regulations into products, processes and the supply chain.
- ○ The company applies a proactive approach towards the application of new as well as emerging rules, regulations and standards leading to a competitive advantage over its direct competitors.
- ○ Within its value chain, the company is considered a reference stakeholder in the process of shaping new rules, regulations and standards.

Did you already realise projects or deliverables in context of this transformation area?

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Yes, some projects have been initiated, but mainly ad hoc and limited in scope
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Transformation 4 – End-to-End Customer Focused Engineering

Manufacturing SME's use customer expectations as the key driver and starting point for all new developments and processes.

Robust, high-quality product, manufacturing and service creation processes are the result of a cross-functional and cross-departmental design approach.

Supported by the use of virtual models and simulation tools where possible, this transformation optimises processes to create maximum value throughout the design, manufacturing, usage, servicing and disposal part of the company's value chain.

Customer focus & value proposition

The company maximises customer value creation whilst carefully managing related costs and risks.

Customer integration:

How does your company collect, process and document market and customer information?

- ◉ Input from sales is being used by engineering

- Key account requirements are actively incorporated in the engineering of the products.
- Requirements of as many customers as possible are actively incorporated into the engineering and manufacturing of the products.
- Customer requirements are systematically documented and integrated throughout the engineering, manufacturing and servicing steps of the products.
- All customer requirements are continuously kept up-to-date to be used throughout all engineering, manufacturing and servicing processes in order to obtain the highest possible value solution for each individual customer.

Robust engineering processes

In order to speed up time to market, the company uses design, manufacturing and disposal processes that are robust, standardised and of highest quality.

Interdepartmental co-creation & stakeholder involvement:

How does your company initiate and form development teams?

- A selection of the individual engineering employees master project-focused work methods. Improvements in processes are initiated by managers or specialists The organisation works ad hoc on process improvement.
- Internal stakeholders from different departments work together when moving from the development to the production phase of a product. Departments work together easily to work on improvements and redesign processes.
- New product, process and/or service developments incorporate actual production capabilities/restrictions. Individuals and managers active in operations are involved in co-creation. Individuals can work-out and participate in initiatives on new products and production processes.
- Cross departmental project teams actively work together using digital tools that can manage multiple workflows and different data sets. Individuals can easily reach out to others within the company. It is obvious for all employees to involve others to think and/or work out of the box.
- Centralized, cloud-based CAD, CAE and PLM capabilities enable the integration of multiple internal competence teams as well as external stakeholder collaboration. New and temporary project teams develop quickly to implement innovations. Individuals can easily link to other partners in the supply chain.

Managing quality & robustness:

How is your company collecting and leveraging product-related data (product and service changes, preventive and corrective actions, transfer processes, manufacturing feasibility tests, etc.)?

- Engineering projects are documented mainly to cover scope and manufacturing feasibility.
- Engineering projects are regularly being followed up and design, production & service specifications are documented.
- The reliability and predictability of both the development of new basic technology as well as incremental product & process development is continuously maximised.
- Specific KPIs for new products, processes and services are defined, actively used and documented.
- Both internal and external feedback is converted to KPI's covering all products and processes, both new and existing.

Did you already realise projects or deliverables in context of this transformation area?

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Engineering projects are documented mainly to cover scope and manufacturing
feasibility
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Transformation 5 – Human Centred Organisation

Employee involvement in the future development of the company is crucial.

Individual factory workers need to be transformed to a group of employees with the autonomy and space to channel their talent, creativity and initiatives within the context of an innovative organisation. The best fitting leadership style (servant, inspirational, coaching, …) should enable competence and skill development. Sustainable employability is about motivating and supporting individual employees to continue to contribute to a(ny) labour process, through continuous/repetitive evaluation of their skills and update of their competencies through training, coaching, etc.

The resulting climate is such that people feel the relevance of continuous learning and remain motivated to provide a top performance.

Individual employee

The company invests in challenging jobs, thereby focusing on individual growth and self-realisation, in terms of skills, knowledge and competences.

Experience & knowledge accumulation:

How is tacit knowledge (lessons learned, operative knowledge, etc.) managed and shared in your company?

- The knowledge gained about best practices, operational problems or lessons learned is not documented, but is kept in the minds of individual employees. The management of experience (operations knowledge that has been accumulated) is seen as a managerial responsibility.
- Operational problems and solution experiences are discussed by supervisors and management. The re-use of existing experience (operations knowledge that has been accumulated) is the responsibility of those involved.
- The supervisor ensures the storage and monitoring of solution experiences. In case of operational problems, the manager reacts and provides advice. Active learning is being done.
- Although the team takes the lead in solving operational problems, each individual has the necessary knowledge and skills or knows who they can turn to for additional input. Systems for tracking lessons learned are actively used. Newly gained experience (operations knowledge that has been accumulated) is automatically distributed among all team members.
- The team autonomously manages the processes and resolves operational problems with ease, without the intervention of a supervisor or manager. They have the skills and framework to develop and improve processes, to innovate and to maintain the sustainability of all of their responsibilities. The company culture stimulates and heavily invests in learning based on acquired experience (operations knowledge that has been accumulated) and the continuous operational consultation between team members.

Teams

The organisation empowers teams to ensure efficient production. Teams work with authority and responsibility.

Autonomy:

How much authority and responsibility do the teams have to ensure team development, learning and continuous improvement?

- (●) The operational manager assigns tasks to individual employees and supervises their execution.
- ( ) Individual employees receive work instructions without a kind of group or team being involved. As a consequence employees work alongside each other, not together.
- ( ) Groups of individual employees structurally monitor the activities and take appropriate actions if adjustments are needed. People work closely together and the interdependence and connections are strong. The manager actively participates and acts as a group coach rather than a hierarchical superior. The groups of individual employees have autonomy to determine the work approach, the division and organisation of tasks.
- ( ) The team organises itself, both in terms of internal operations and goals and in terms of external contacts, outside of the own team. Depending on the aspirations and needs of individual employees, a team can easily switch between competencies and tasks in which the burden and capacity of each individual are respected. Teams manage themselves autonomously and have acquired the necessary skills to translate this into their work organisation.
- ( ) Teams are assembled in a very agile fashion. When the composition of teams changes, the team members can easily arrange the work through mutual consultation. Even if there are potential conflicts of interest between the collective and the individual, people on the shop floor succeed in resolving and managing these conflicts. The teams systematically work closely together at the shop floor, and a lot of knowledge and information is exchanged across the teams.

Leadership

A clear vision and strategy is well deployed and new leadership roles have been developed.

Vision & Strategy:

How actively and openly do your company's leaders promote development and communicate about future opportunities?

- (●) Management informs all individual employees on the results and long term vision on an annual basis. No relation is made to the daily job context of individual employees. Company information is provided in a one-directional way, with little room for discussion.
- ( ) Management regularly provides updates on company results and vision. Strategy and projects are reported as well. Initiatives are set up to keep individual employees informed.
- ( ) Management engages in explaining the vision and strategy and in finding the links between individual employees and the company’s vision and strategy.
- ( ) Management and teams discuss the vision and strategy as well as the way individual employees can contribute to the realisation of these goals, but also on the impact these goals have on them and how that might create opportunities. Management succeeds in stimulating and motivating everyone through the links with the company vision.
- ( ) In collaborative team discussions all teams define the way they contribute to the realisation of the future vision and strategy set out by top management. Individual employees understand the interaction between different projects, departments, teams, etc. and how they can collaborate.

Organisation

The organisation stimulates life-long learning and individual growth paths using an open communication philosophy between all hierarchical levels.

Open dialogue:

How open is communication between hierarchical levels on diverse topics, including company results?

- The information sharing between management and the employee (representatives) is carried out according to formal principles. There is hardly any cooperation and the interaction is mainly limited to mandatory consultation moments.
- Individual employee representatives have a direct line with management. There is a willingness and openness to address urgent questions or specific projects on an ad-hoc basis outside of the scheduled consultation moments.
- Not only individual employee representatives, but also individual employees themselves, have an open communication line with management and managers. Both ad-hoc issues and project specific issues can be discussed.
- All individual employees can consult with supervisors and management about the vision, strategy & projects. There are open discussions about changes, in which all individual employees are involved at the appropriate moments.
- The boundaries between hierarchical layers have disappeared in all communication and consultation moments. Everyone collaborates as partners of the company. There is a joint effort to outline the future strategy and all interested parties can commit themselves to take on an additional role in innovative initiatives or projects.

Did you already realise projects or deliverables in context of this transformation area?

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Yes, some projects have been initiated, but mainly ad hoc and limited in scope
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Transformation 6 – Smart Manufacturing

Smart Manufacturing can be defined as the combination of the smart use of people's capabilities, the smart use of technology and the deployment of a (self-) learning production system.

Smart manufacturing entities focus on customer oriented product quality, services, delivery times and reliability through a shop floor organisation which is flexible, digitised, automated and fully connected with the organisation and the value chain.

The purpose is to create maximum efficiency, flexibility and value creation of machine operators and employees on the shop floor.

Image

Human-machine interaction

The company designs its shop floor processes such that they are able to exploit the full potential offered by user-friendly, automated, intelligent and flexible human–machine interaction, ranging from digital connected machines to using real-time connected info carriers, cobots, robots, etc.

From rigid automation to flexible manufacturing:

How integrated and automated are your company's production processes?

- Manufacturing equipment works on a stand-alone basis without any automation solutions.

- ○ Key manufacturing equipment and automation solutions are combined into Manufacturing Cells connected to a digital platform.
- ◉ Machines can launch and perform simple and/or repetitive tasks in a digital and automated way.
- ○ Intelligent use of real-time information enables efficient and flexible automation, communication and production planning.
- ○ Advanced and automated planning and operation of digitally connected manufacturing equipment guarantees maximum efficiency and flexibility levels.

Shop floor tasks:

How widely are automations and intelligent machines in use in your company?

- ○ No automations or robotic systems are present at the shop floor.
- ◉ Specific repetitive and tedious manufacturing tasks are performed by industrial automations and/or robotic systems.
- ○ Intelligent automated machines, cobots and/or robots are present. They enable individual employees to spend less time on tedious jobs enabling them to take on more complex tasks.
- ○ Intelligent automated machines, cobots and/or robots perform simple and/or repetitive tasks while also supporting parts of the complex tasks of the individual employee.
- ○ Intelligent automated machines, cobots and/or robots work alongside individual employees for maximum employee and customer value creation.

Manufacturing Planning & Control Processes

The company uses self-managed manufacturing and quality control systems in order to “organise for complexity”, i.e. being able to adapt quickly to changing orders and customer requests without always having to go in rush order status. Smart manufacturing KPI’s are used as an essential monitoring and improvement tool for the shop floor to support high levels of productivity and flexibility.

First time right:

What is your company's approach to Quality Assurance?

- ◉ Quality assurance is achieved by inspecting every single product.
- ○ Quality inspection techniques and statistical models are used to improve quality.
- ○ Key manufacturing processes are monitored in order to control and predict product quality.
- ○ Widespread, real-time monitoring of manufacturing processes along with automated feedback based actions guarantee First Time Right production.
- ○ Knowledge on the relationship between manufacturing parameters and final product quality enables First Time Right in 'lot size 1' environments or in manufacturing environments needing quick changeovers.

Did you already realise projects or deliverables in context of this transformation area?

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Yes, some projects have been initiated, but mainly ad hoc and limited in scope
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Transformation 7 – Value Chain-Oriented Open Factory

Innovations of the highest quality and using the most complex technologies are increasingly being carried out by self-organising networks. Networks are interlinked organisations that generate, acquire and integrate specific knowledge and skills to co-create new solutions, products and/or technologies. Self-organisation refers to the ability of these networks to combine and recombine the learned skills based on a flexible and de-centralised management.

In a world of exponentially increasing technology developments and fast changing customer demands, companies can no longer depend exclusively on proprietary research and resources. They develop their products, manufacturing processes and services with the complete value chain in mind. Individual producers increasingly need to enable co-creation thereby expanding innovative capabilities. Factories are evolving from solo-players to networked organisations that share both risk and capital.

Cooperation and Partnerships

The organisation is structured to be agile and open towards various cooperation and partnership initiatives in order to enable co-creation, create demand-driven value chains and increase the factory's innovative capabilities.

Internal Innovation Network:

Does your company have a strategic innovation plan?

- ○ No innovation plan or structure is present, innovations happen coincidentally.
- ◉ Innovations are realized by a small number of people. They only happen when specific challenges need to be addressed.
- ○ An innovation plan is defined and new ideas are welcomed through open communication structures.
- ○ A management system supports and visualises the idea generation and execution process included in the innovation plan.
- ○ A multi-dimensional innovation plan targeting both short to long term impacts is both supported and executed by teams throughout the whole of the organisation.

Partnership-driven innovation:

Are networks of innovation actively used by the factory as a way to combine and recombine internal as well as external knowledge to reach the position of an innovation leader?

- ○ The organisation has no R&D partnerships.
- ◉ The organisation creates R&D partnerships if an opportunity occurs.
- ○ The organisation has some R&D partnerships with whom they share or whom they use to obtain access to key resources or knowledge.
- ○ The organisation has a multitude of structural R&D partnerships that are drawn upon in order to gain access to external knowledge required to realise innovations.
- ○ The organisation acts and is recognized as an innovation leader within a broad, international network expanding beyond its own competences.

External Expertise & Knowledge Management

To offer individualized and state-of-the-art products, the needs, demands and knowledge beyond the company's borders must be tapped into.

External knowledge management:

Does your company screen, capture and integrate external knowledge on new technologies, ICT- tools, finances, markets, etc. to be able to adapt to changes in its environment?

- (●) External knowledge is only available at the level of individual employees and is not stored centrally.
- ( ) There are sporadic impulses for collecting and storing external knowledge
- ( ) First elements of an external knowledge management system have been introduced.
- ( ) A formal external knowledge management system is implemented and actively used.
- ( ) Every individual employee works intrinsically and in a self-controlled manner, contributing in a role as a kind of trend watcher and transfers acquired knowledge to colleagues in a formal and informal way.

Did you already realise projects or deliverables in context of this transformation area?

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Yes, some projects have been initiated, but mainly ad hoc and limited in scope
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Thank you for your participation! You will receive a short report based on your input within 90 minutes of submitting the survey. You are always welcome to contact the TranS4MErs Team at info@trans4mers.eu.

We appreciate your feedback below.

Disclaimer

On behalf of the European Commission, the ADMA TranS4MErs project team makes every effort to ensure that the information on this website is as complete, correct and up to date as possible, but cannot guarantee that the information provided will not show any shortcomings. They cannot be held liable for damage resulting from any incorrect information on this website.

By completing your e-mail address and by presenting the case of your company, you consent that the ADMA TranS4MErs project team may contact you regarding your case in order to obtain more information, discuss the matter and possible further steps.

Your Company:

Manufacturing Sector

Automotive and Transportation

Company Information – Which of the following categories does your company belong to?

- (●) Small
- ( ) Medium-Sized

Micro

*Company Information - Enter your VAT number

Text of 8 to 12 characters will be accepted

SI12345678

Understanding Challenges

	Agree	Neutral	Disagree
The survey has helped me to have a better view of the challenges my company needs to overcome to become a Factory of the Future.	◉	○	○

Feedback:

Questionnaire Concepts

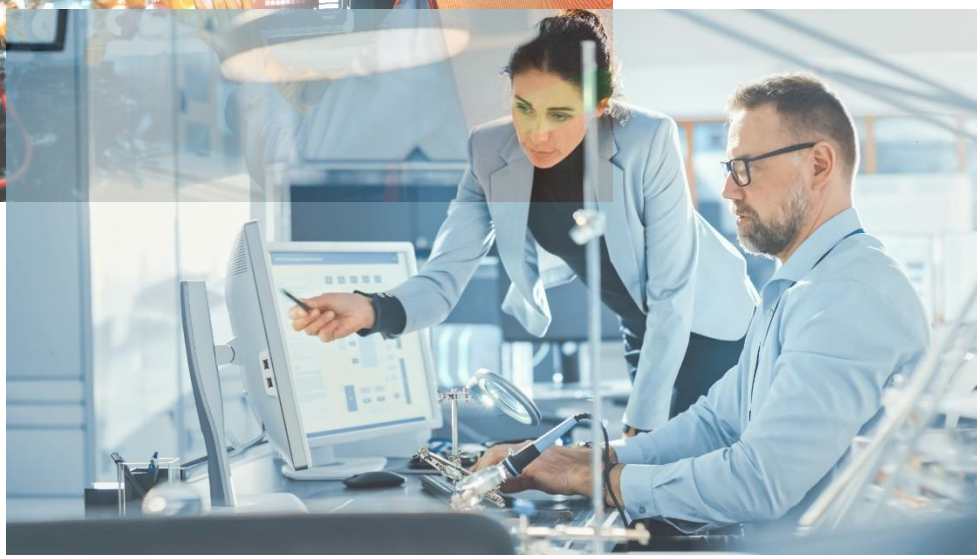
	Agree	Neutral	Disagree
The concepts used in the questionnaire (e.g. transformation, Factories of the Future) are clear to me.	◉	○	○

Could you please indicate which aspects were not sufficiently clear to you?

Thank you for your feedback. If you have any questions, please reach out to info@trans4mers.eu.

Contact

TranS4MErs@imr.ie



ADMA TranS4MErs Scan Results

ADMA TranS4MErs Scan Results

Completing the ADMA TranS4MErs Scan is the start of your advanced manufacturing transformation journey. In this short report you will find your scores in the 7 transformation areas alongside the benchmark Factory of the Future (FoF) scores and other SMEs.

ADMA TranS4MErs can help you start your digital transformation journey by working with our qualified advisors, our 'TranS4MErs', who will be your one-to-one support. They can help you create your Transformation and Implementation Plan and guide you through all steps of your transformation journey. Continue your journey by connecting with your TranS4Mer to start your individualized Transformation Plan.

This report contains:

- Results summary
- Your answers and scores for each transformation area
- Next steps

You can view the scan results at any point by returning to the ADMA TranS4MErs xChange platform at www.trans4mersxchange.eu.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101037866.

Results Summary

Your average maturity score:

1.24/5

Target Score:

4/5

Your Company
Factory of The Future Benchmark
Average Scan Responses

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101037866.

Highest and Lowest Scoring Transformation Areas at a Glance

The table below shows an overview of the scores for each Transformation Area based on the scan answers you have provided and how that relates to the Factory of the Future Benchmark.

	Your Score	FOF Benchmark	Gap to FoF Benchmark
T1: Advanced Manufacturing Technologies	1	4	-3
T2: Digital Factory	1	4	-3
T3: ECO Factory	1	4	-3
T4: End-to-end Customer Focused Engineering	1	4	-3
T5: Human Centred Organisation	1	4	-3
T6: Smart Manufacturing	2	4	-2
T7: Value Chain Oriented Open Factory	1.67	4	-2.33

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Transformation Area Scores

T1: Advanced Manufacturing Technologies

Score: 1

This transformation is based on deploying state-of-the-art manufacturing devices. Given the high wage level, European manufacturing SMEs cannot afford to manufacture using machinery that is outdated as compared to that of their non-European competitors. Factories of the Future develop their own devices for key components in production, and thus boast machinery that is globally unique.

Project or deliverables already undertaken in this transformation area:
Yes, some projects have been initiated, but mainly ad hoc and limited in scope

Vision				
1.1 Strategy: Is a clear investment policy that matches the strategic vision put into practice?				
	An investment plan for replacing out-of-date machines exists.	A detailed multiyear investment plan exists for the introduction of state-of-the-art technologies.	The company's technology roadmap includes multiyear investment plans as well as the evaluation of new technologies through feasibility studies.	The company's technology roadmap includes a research and development approach for advancement of relevant technologies to higher maturity levels.
Level of Capabilities				
1.2 Employees: How does your company ensure that its employees are qualified to handle advanced manufacturing technologies?				

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	The company organises annually update trainings for machine operators.	In order to optimize technology usage the company organises trainings for all individual employees at regular intervals.	The company supports individual employees in achieving expertise levels to enable them to implement process improvements themselves.	Individual employees achieve expertise levels enabling them to fully cope with new technologies.
Level of Implementation				
1.3 Maintenance: Does the maintenance strategy enable high levels of Overall Equipment Effectiveness (OEE)?				
	A preventive maintenance plan follows fixed time schedules.	Maintenance is managed based on current technology usage, eg interventions at pre-determined equipment usage levels.	Predictive maintenance is being executed through productivity measurement at pre-determined equipment usage levels making sure interventions are only done if needed.	An intelligent maintenance plan is based on real-time monitoring of critical components, enabling focussed interventions at the moment of potential productivity loss.

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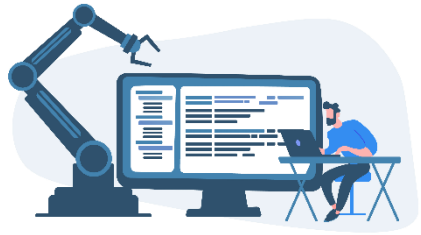

T2: Digital Factory
Score: 1

Companies use digital technology to transform the development of products and/or processes into physical products, systems or services. All employees are supported by digital and integrated processes. Integral control of the digital information flow ensures the simulation of virtual scenarios before actually implementing the activities. The digital factory guarantees the accuracy of the data at any given moment in time. Each data item is only entered once into the system and all other systems retrieve the data item automatically to create new information, a so-called Single Source of Truth.

Project or deliverables already undertaken in this transformation area:
yes, some projects have been initiated, but mainly ad hoc and limited in scope.

Enabling Infrastructure				
2.1 Connected shop floor: Are the equipment at the shop floor connected to a network to enable data exchange?				
	Some equipment is connected to a company network. Data is transferred manually to or from the equipment (e.g. programs can be transferred to the machine over the network, but the transfer itself is most often	Equipment is connected to a company network providing access to the most important information and enabling the transfer of information to and from the machine. Important legacy	All vital equipment is connected and intelligence is added through the integration of sensors, gateways, etc. The exchange of data between machines and other shop floor entities is carried out via the	All shop floor entities are smart and connected in an open way and autonomously share information. Data communication is carried out via standardised and open data structures. Any entity can connect to any other entity if desired or required.

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	initiated manually).	equipment is digitally enabled through a connectivity module and/or digital identification tags.	network through middleware and/or MES systems.	
2.2 Secure digital infrastructure: Do security information and event management systems safeguard a continuous and smooth manufacturing operation?				
	The organisation complies with existing industry and security standards Responsibility lies mainly within the ICT department and reviews of policies, procedures and third-party risk assessments happen occasionally. As the organisation is unprepared, breaches go largely unnoticed.	The organisation is aware that data are to be considered an important asset that has to be protected and for which trusted data exchange systems need to be ensured. The organisation defends itself by deploying cybersecurity technology, such as gateways, firewalls, DMZ setups, ACM and/or anti-malware protection. The ICT department is still	The organisation has put in place a comprehensive Security Information and Event Management system, seeking to avoid attacks. Management understands the importance of cybersecurity and the need for a dedicated policy with regular reviews. The ICT department focuses on the critical day-to-day operation of the network, and third parties are approached to	The organisation has a system to detect anomalies and breaches, as well as a threat intelligence system, feeding back information to other operative elements in place. Management is largely involved. Reviews and risk assessments are ongoing, with third-party expertise alleviating the security workload of the ICT team where needed.

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		responsible, but periodically also third-party risk assessments are executed.	take over some of the security responsibilities when appropriate.	
Digital Capabilities				
2.3 Transparent view on shop floor status: How is your company using real-time production data for optimisation and decision making?				
	The most important processes are monitored on paper and/or digitally and the data is stored on a periodic basis.. People are able to find out what is happening in production but accessing and assembling this information delay appropriate actions and countermeasures to a large extent. The company's ICT systems are not always coupled, requiring manual combination of	Up-to-date information is available and visualised through production dashboard. Employees are involved in a timely fashion if e.g. a machine breaks down in production.	Production data is used for ad-hoc analytics to support decisions. Some analytics might be integrated in decision support systems for e.g. predictive maintenance. Remote monitoring of equipment is implemented enabling machines to automatically notify personnel when there is an issue. The company has executed first experiments around data analytics and	Data analytics are integrated within decision support systems and automated decision making through Machine Learning and Artificial Intelligence is being implemented.

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	data from different sources.		automated decision making through Machine Learning and Artificial Intelligence is being implemented.	
2.4 Mastering the digital transformation: Is the digital transformation being managed as part of the company's DNA?				
	The organisation is convinced of the importance of a digital transformation. Some aspects of the digital transformation are managed. However, a digital roadmap linking all elements and guiding the transition is not yet available.	The organisation has defined a shared vision for digitisation and is convinced of the need for a well-managed transition. Information and knowledge is being gathered in order to define a roadmap for the digital transformation.	The organisation has a clear roadmap for the digitisation process and has defined the required expertise/capabilities, priorities, responsibilities, etc. Core teams are formed for the roll-out and progress is continuously monitored. External expertise is called upon when needed.	The organisation has a well-managed digital transformation in place. A large part has already been digitised and a system for continuous digital knowledge acquisition is in place. The digital transformation and all its aspects are part of the company's organisational and cultural DNA.

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T3: ECO Factory
Score: 1

Being a front-runner in eco-production offers companies advantages such as cost reduction, risk reduction in raw material and energy supply, as well as in terms of a company's social responsibility image. Sustainable production includes a resilient production system based on the availability of raw materials and auxiliary materials. These systems are capable of closing the material cycle in order to optimize the efficiency of raw material usage.
The production system is aimed at a drastic reduction in energy consumption and the use of renewable energy sources. Companies are well attuned to the significance of the environmental impact of their activities and are constantly searching for ways to reduce the ecological footprint of their processes, products and services.

Project or deliverables already undertaken in this transformation area:
Yes, some projects have been initiated, but mainly ad hoc and limited in scope

Resource Management				
3.1 Materials usage: How is your company using product and manufacturing optimisation to reduce its raw material consumption?				
	Project-driven material usage improvements of the most relevant products and manufacturing processes have been implemented.	The company has set specific objectives and implements a methodological approach covering the transformation of materials consumption at	The company draws upon the best available technologies to reduce the material usage of machines, processes, products and methods.	Systems capable of closing the material cycle in order to optimize the efficiency of raw material usage (also called Circular Economy principles) have been implemented through strategic and stable partnerships with customers, suppliers and other key experts.

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		machine, process and factory level.		
Compliance & Innovation				
3.2 Rules, regulation & standards: How actively does your company drive development of new rules, regulations and standards?				
	The company as well as its supply chain is compliant with existing rules and regulations.	The company applies effective and timely methods for integrating new regulations into products, processes and the supply chain.	The company applies a proactive approach towards the application of new as well as emerging rules, regulations and standards leading to a competitive advantage over its direct competitors.	Within its value chain, the company is considered a reference stakeholder in the process of shaping new rules, regulations and standards.

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T4: End-to-End Customer Focused Engineering
Score: 1

Manufacturing SME's use customer expectations as the key driver and starting point for all new developments and processes.

Robust, high-quality product, manufacturing and service creation processes are the result of a cross-functional and cross-departmental design approach.

Supported by the use of virtual models and simulation tools where possible, this transformation optimizes processes to create maximum value throughout the design, manufacturing, usage, servicing and disposal part of the company's value chain.

Project or deliverables already undertaken in this transformation area:

Engineering projects are documented mainly to cover scope and manufacturing feasibility

Customer focus & value proposition				
4.1 Customer Integration: How does your company collect, process and document market and customer information?				
	Key account requirements are actively incorporated in the engineering of the products.	Requirements of as many customers as possible are actively incorporated into the engineering and manufacturing of the products.	Customer requirements are systematically documented and integrated throughout the engineering, manufacturing and servicing steps of the products.	All customer requirements are continuously kept up-to-date to be used throughout all engineering, manufacturing and servicing processes in order to obtain the highest possible value solution for each individual customer.

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Robust Engineering Processes				
4.2Interdepartmental co-creation & stakeholder involvement: How does your company initiate and form development teams?				
	Internal stakeholders from different departments work together when moving from the development to the production phase of a product. Departments work together easily to work on improvements and redesign processes.	New product, process and/or service developments incorporate actual production capabilities/restrictions. Individuals and managers active in operations are involved in co-creation. Individuals can work-out and participate in initiatives on new products and production processes.	Cross departmental project teams actively work together using digital tools that can manage multiple workflows and different data sets. Individuals can easily reach out to others within the company. It is obvious for all employees to involve others to think and/or work out of the box.	Centralized, cloud-based CAD, CAE and PLM capabilities enable the integration of multiple internal competence teams as well as external stakeholder collaboration. New and temporary project teams develop quickly to implement innovations. Individuals can easily link to other partners in the supply chain.
4.3 Managing quality & robustness: How is your company collecting and leveraging product-related data (product and service changes, preventative and corrective actions, transfer process, manufacturing feasibility tests, etc.?				
	Engineering projects are regularly being followed up and design, production & service specifications are documented.	The reliability and predictability of both the development of new basic technology as well as incremental product &	Specific KPIs for new products, processes and services are defined, actively used and documented.	Both internal and external feedback is converted to KPI's covering all products and processes, both new and existing.

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		process development is continuously maximised.		

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T5: Human Centred Organisation
Score: 1

Employee involvement in the future development of the company is crucial.
Individual factory workers need to be transformed to a group of employees with the autonomy and space to channel their talent, creativity and initiatives within the context of an innovative organisation.
Sustainable employability is about motivating and supporting individual employees to continue to contribute to a(ny) labor process, through continuous/repetitive evaluation of their skills and update of their competencies through training, coaching, etc.
The resulting climate is such that people feel the relevance of continuous learning and remain motivated to provide a top performance.

Project or deliverables already undertaken in this transformation area:
Yes, some projects have been initiated, but mainly ad hoc and limited in scope

Individual Employee				
5.1 Experience and knowledge accumulation: How is tacit knowledge (lessons learned, operative knowledge etc.) managed and shared in your company?				
	Operational problems and solution experiences are discussed by supervisors and management. The re-use of existing experience	The supervisor ensures the storage and monitoring of solution experiences. In case of operational problems, the manager reacts	Although the team takes the lead in solving operational problems, each individual has the necessary knowledge and skills or knows who they can	The team autonomously manages the processes and resolves operational problems with ease, without the intervention of a supervisor or manager. They have the skills and framework to develop and improve processes, to innovate and to maintain the sustainability of all of their responsibilities. The company culture stimulates and heavily invests in learning based on acquired experience (operations knowledge that has been accumulated) and the continuous operational consultation between team members.

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	(operations knowledge that has been accumulated) is the responsibility of those involved.	and provides advice. Active learning is being done.	turn to for additional input. Systems for tracking lessons learned are actively used. Newly gained experience (operations knowledge that has been accumulated) is automatically distributed among all team members.	
Team				
5.2 Autonomy: How much authority and responsibility do the teams have to ensure team development, learning and continuous improvement?				
	Individual employees receive work instructions without a kind of group or team being involved. As a consequence employees work alongside each other, not together.	Groups of individual employees structurally monitor the activities and take appropriate actions if adjustments are needed. People work closely together and the interdependence and connections are strong. The	The team organises itself, both in terms of internal operations and goals and in terms of external contacts, outside of the own team. Depending on the aspirations and needs of individual employees, a team can easily	Teams are assembled in a very agile fashion. When the composition of teams changes, the team members can easily arrange the work through mutual consultation. Even if there are potential conflicts of interest between the collective and the individual, people on the shop floor succeed in resolving and managing these conflicts. The teams systematically work closely together at the shop floor, and a lot of knowledge and information is exchanged across the teams.

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		manager actively participates and acts as a group coach rather than a hierarchical superior. The groups of individual employees have autonomy to determine the work approach, the division and organisation of tasks.	switch between competencies and tasks in which the burden and capacity of each individual are respected. Teams manage themselves autonomously and have acquired the necessary skills to translate this into their work organisation.	
Leadership				
5.3 Vision and Strategy: How actively and openly do your company's leaders promote development and communicate about future opportunities?				
	Management regularly provides updates on company results and vision. Strategy and projects are reported as well. Initiatives are set up to keep individual employees informed.	Management engages in explaining the vision and strategy and in finding the links between individual employees and the company's vision and strategy.	Management and teams discuss the vision and strategy as well as the way individual employees can contribute to the realisation of these goals, but also on the impact these goals have on them and how	In collaborative team discussions all teams define the way they contribute to the realisation of the future vision and strategy set out by top management. Individual employees understand the interaction between different projects, departments, teams, etc. and how they can collaborate.

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			that might create opportunities. Management succeeds in stimulating and motivating everyone through the links with the company vision.	
Organisation				
5.4 Open dialogue: How open is communication between hierarchical levels on diverse topics, including company results?				
	Individual employee representatives have a direct line with management. There is a willingness and openness to address urgent questions or specific projects on an ad-hoc basis outside of the scheduled consultation moments.	Not only individual employee representatives, but also individual employees themselves, have an open communication line with management and managers. Both ad-hoc issues and project specific issues can be discussed.	All individual employees can consult with supervisors and management about the vision, strategy & projects. There are open discussions about changes, in which all individual employees are involved at the appropriate moments.	The boundaries between hierarchical layers have disappeared in all communication and consultation moments. Everyone collaborates as partners of the company. There is a joint effort to outline the future strategy and all interested parties can commit themselves to take on an additional role in innovative initiatives or projects.

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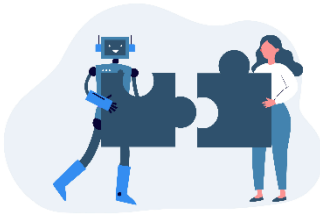

T6: Smart Manufacturing
Score: 2

Smart Manufacturing can be defined as the combination of the smart use of people's capabilities, the smart use of technology and the deployment of a (self-) learning production system. Smart manufacturing entities focus on customer oriented product quality, services, delivery times and reliability through a shop floor organisation which is flexible, digitised, automated and fully connected with the organisation and the value chain. The purpose is to create maximum efficiency, flexibility and value creation of machine operators and employees on the shop floor.

Project or deliverables already undertaken in this transformation area:
Yes, some projects have been initiated, but mainly ad hoc and limited in scope

Human-machine interaction				
6.1 From rigid automation to flexible manufacturing: How integrated and automated are your company's production processes?				
Manufacturing equipment works on a stand-alone basis without any automation solutions.	Key manufacturing equipment and automation solutions are combined into Manufacturing Cells connected to a digital platform.		Intelligent use of real-time information enables efficient and flexible automation, communication and production planning.	Advanced and automated planning and operation of digitally connected manufacturing equipment guarantees maximum efficiency and flexibility levels.
6.2 Shop floor tasks: How widely are automations and intelligent machines in use in your company?				
No automations or robotic systems are		Intelligent automated machines, cobots	Intelligent automated machines, cobots	Intelligent automated machines, cobots and/or robots work alongside individual employees for maximum employee and customer value creation.

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present at the shop floor.		and/or robots are present. They enable individual employees to spend less time on tedious jobs enabling them to take on more complex tasks.	and/or robots perform simple and/or repetitive tasks while also supporting parts of the complex tasks of the individual employee.	
Manufacturing Planning & Control Processes				
6.3 First time right: What is your company's approach to Quality Assurance?				
	Quality inspection techniques and statistical models are used to improve quality.	Key manufacturing processes are monitored in order to control and predict product quality.	Widespread, real-time monitoring of manufacturing processes along with automated feedback based actions guarantee First Time Right production.	Knowledge on the relationship between manufacturing parameters and final product quality enables First Time Right in 'lot size 1' environments or in manufacturing environments needing quick changeovers.

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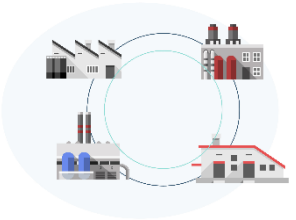

T7: Value Chain Oriented Open Factory
Score: 1.67

Innovations of the highest quality and using the most complex technologies are increasingly being carried out by self-organising networks. Networks are interlinked organisations that generate, acquire and integrate specific knowledge and skills to co-create new solutions, products and/or technologies. Self-organisation refers to the ability of these networks to combine and recombine the learned skills based on a flexible and de-centralised management.
In a world of exponentially increasing technology developments and fast changing customer demands, companies can no longer depend exclusively on proprietary research and resources. They develop their products, manufacturing processes and services with the complete value chain in mind. Individual producers increasingly need to enable co-creation thereby expanding innovative capabilities. Factories are evolving from solo-players to networked organisations that share both risk and capital.

Project or deliverables already undertaken in this transformation area:
Yes, some projects have been initiated, but mainly ad hoc and limited in scope

Cooperation and Partnerships				
7.1 Internal Innovation Network: Does your company have a strategic innovation plan?				
No innovation plan or structure is present, innovations happen coincidentally.		An innovation plan is defined and new ideas are welcomed through open communication structures.	A management system supports and visualises the idea generation and execution process included in the innovation plan.	A multi-dimensional innovation plan targeting both short to long term impacts is both supported and executed by teams throughout the whole of the organisation.
7.2 Partnership-driven innovation: Are Networks of innovation actively used by the factory as a way to combine and recombine internal as well as external knowledge to reach the position as an innovation leader?				

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The organisation has no R&D partnerships.		The organisation has some R&D partnerships with whom they share or whom they use to obtain access to key resources or knowledge.	The organisation has a multitude of structural R&D partnerships that are drawn upon in order to gain access to external knowledge required to realise innovations.	The organisation acts and is recognized as an innovation leader within a broad, international network expanding beyond its own competences.
External Expertise and Knowledge Management				
7.3 External knowledge management: Does your company screen, capture and integrate external knowledge on new technologies, ICT- tools, finances, markets, etc. to be able to adapt to changes in its environment?				
	There are sporadic impulses for collecting and storing external knowledge	First elements of an external knowledge management system have been introduced.	A formal external knowledge management system is implemented and actively used.	Every individual employee works intrinsically and in a self-controlled manner, contributing in a role as a kind of trend watcher and transfers acquired knowledge to colleagues in a formal and informal way.

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Next Steps

Thank you for filling out the ADMA TranS4MErs scan. The report shows how your company may be described in each of the 7 transformation areas and which areas are to be improved, with the goal of becoming a Factory of the Future.

The next step is for you to discuss and evaluate the results in this document with your TranS4MEr and start developing your Transformation and Implementation Plan with their support. The Transformation and Implementation Plan will guide you through your transformation journey and enable you to get the most out of your transformation.

To continue your journey, visit www.trans4mersxchange.eu.

For more information visit us on www.trans4mers.eu or email info@trans4mers.eu
The ADMA TranS4MErs Team

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