CREATIVITY MEETS INDUSTRY:

A Practical Guide to Transformative Partnerships

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Introduction

Overview of the Toolkit

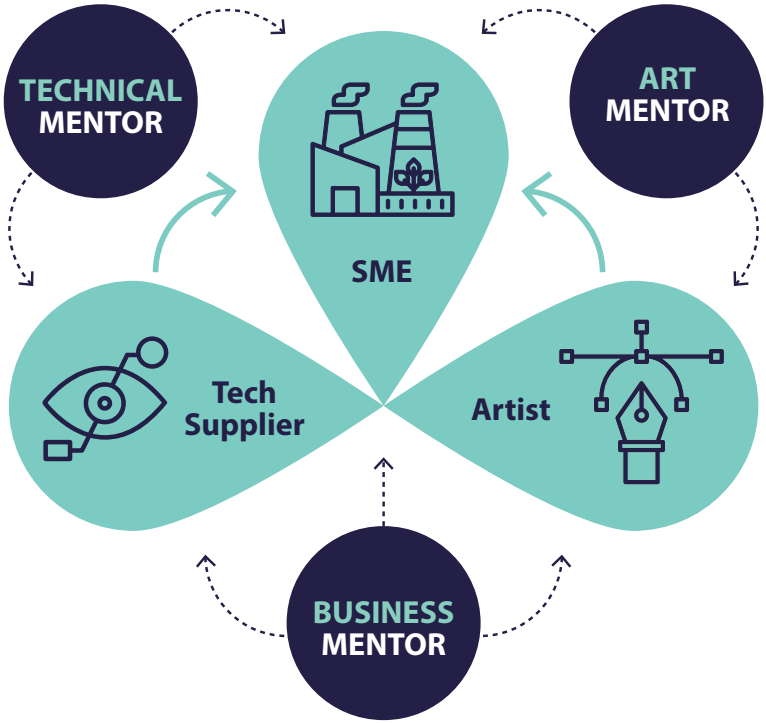
Welcome to the ultimate guide to transforming your industrial challenges thanks to art-driven collaborations, designed especially for manufacturing small and medium enterprises (SMEs), artists, technology providers and intermediaries. This toolkit is your roadmap to success, demonstrating that combining art and industry is a meaningful endeavour that brings useful, inspiring, and innovative results.

Firstly, learn how to effectively frame a particular industrial challenge through clear, step-by-step instructions and real-life examples. Next, understand why the identification of a proper partner match is key, by aligning your challenge with artistic expertise through a structured matchmaking process. Delve into team formation, exploring the roles and responsibilities of various members and discovering strategies for setting effective collaborations. The heart of this toolkit, though, lies in the collaboration's Iteration Cycles with its core methodology of art-driven experimentation cycles, covering the model, strategy, and iterative process. As the collaboration reaches its completion, its legacy is prepared, focusing on outcomes, follow-up actions, and the potential for exploiting the results. Finally, the collaborators are encouraged to share their journey, highlighting successful storytelling practices and learnings, showcasing a curated collection of artistic outputs.

The BETTER FACTORY project & S+T+ARTS

SCIENCE + TECHNOLOGY + ARTS

This toolkit is based on the expertise gained in Better Factory – a four-year EU-funded research and innovation project aiming to inspire European manufacturing SMEs to adopt digital technologies and personalise their products and production. The project lifetime ran from October 2020 to September 2024, bringing together manufacturing SMEs, technology providers and artists in 16 joint experiments.



WHY

- Digitisation journey boost
- New product development
- Responsible innovation

HOW

1. Industrial Challenge
2. Matchmaking
3. Core Team Composition
4. Iteration Cycles
5. Demonstrators
6. Business Modelling

KEY PROJECT DATA

48 Companies taking part in

16 Collaborative experiments

The Better Factory project has developed the "**Better Factory Method**" to mentor a 3-party collaboration **involving an artist, an SME and a tech supplier towards achieving joint objectives**. Mentors have supported the experiments from a technical, artistic, and business perspective. During the project, we developed a wide set of mentoring tools and practices to make sure the experiments are implemented successfully. Each experiment has created useful, inspiring, and innovative results. Many of the solutions are already in operational use in the SME, on the market as new products for the SMEs or technology providers and implemented as artwork by the artists.

What follows in the forthcoming pages are **reflections of the Better Factory mentors closing two rounds of 16-month experiments** in Better Factory. These collaborations are built on S+T+ARTS' collaborative frameworks from its inception in 2016 until 2020.

The **S+T+ARTS** initiative(1) integrates artists into innovation projects, emphasizing the added value and unexpected results from interdisciplinary collaborations in non-artistic domains. By combining science, technology, and the arts, S+T+ARTS aims to **address Europe's social, ecological, and economic challenges through innovative approaches**. The European Commission focuses on projects and people with the potential to contribute meaningfully, driven by the belief that blending science and technology with artistic perspectives opens valuable, holistic, and human-centred approaches for research and business.

These programmes, including VERTIGO, RE-FREAM and the first Regional STARTS Center programme, had a strong focus on establishing **networks of collaborations** between art and science, mediated by technology and, occasionally, supported by industry. The challenge-driven collaborative projects, as well as the mission-driven collaborative projects, were taken as starting points for the development of collaborative projects between artists and manufacturing SMEs in Better Factory.

In Better Factory the Mentoring Team consisted of Art, Tech and Business Mentors coming from GLUON, HBD, HOLONIX, INOVA+, IN4ART and WAAG.

Purpose of the Toolkit

This toolkit aims to transfer the accumulated knowledge and insights of the Better Factory mentoring team to a larger community interested in organising similar collaborative projects at the intersection of art, industry, science, technology, and society. Our goal is to demonstrate that art in industry is a meaningful endeavour that should be supported, nurtured, and advanced further.

(1) starts.eu

Target Audience

The toolkit is designed for small and medium enterprises (SMEs), artists, technology providers, and intermediaries involved in cross-disciplinary collaborations. Whether you are looking to start a new project or improve an existing one, this toolkit provides valuable insights and practical guidance.

Structure of the Toolkit

The toolkit is structured into the following chapters, each addressing a crucial aspect of the collaborative process:

OVERVIEW OF THE TOOLKIT:
This chapter provides a general introduction to the toolkit. It explains its purpose, target audience, and how to navigate the contents effectively.

CHAPTER 1 > FRAME A CHALLENGE:
Guides you through defining your industrial challenge with step-by-step instructions and examples of well-defined and poorly defined challenges.

CHAPTER 2 > FIND A MATCH:
Emphasises the importance of finding a good match between your industrial challenge and artistic expertise, outlining the matchmaking process and key factors to consider.

CHAPTER 3 > FORM A TEAM:
Focuses on team formation, detailing the roles and responsibilities of various team members and providing strategies for effective collaboration and mentoring.

CHAPTER 4 > ITERATION CYCLES:

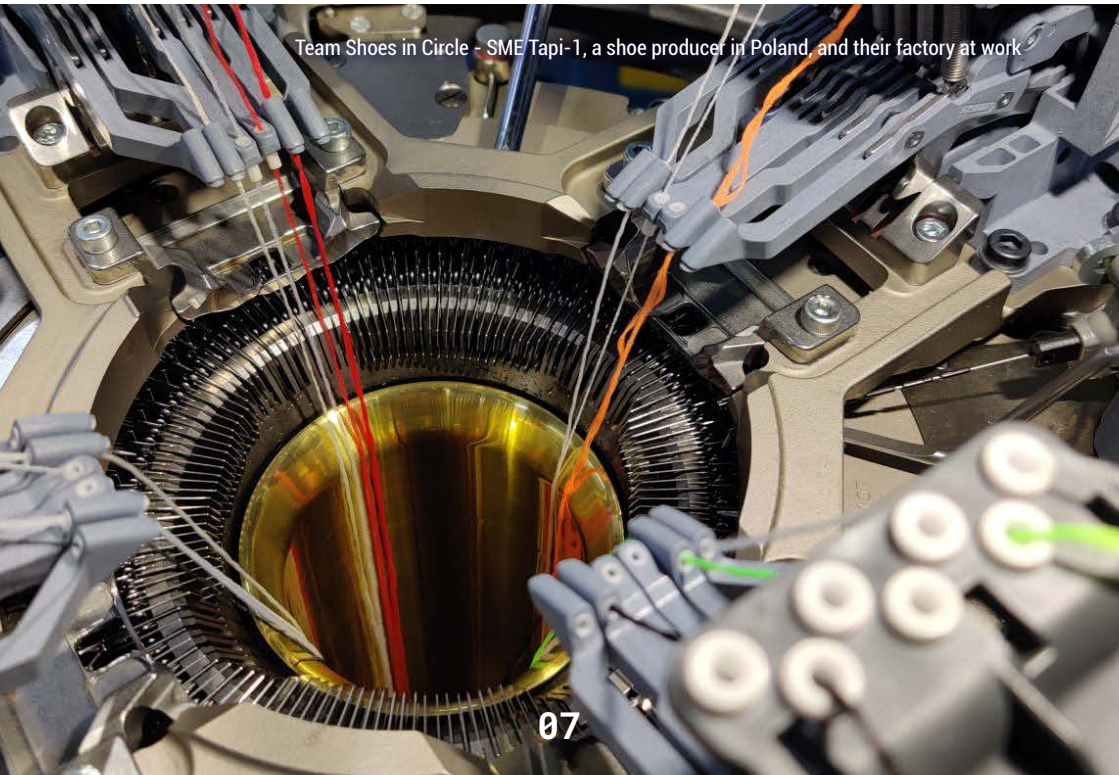
Explains the core methodology of the toolkit: the art-driven experimentation iteration cycle. It covers the model, strategy, and iterative process employed in Better Factory collaborations.

CHAPTER 5 > INNOVATION ROUTE:

Guides you through the next steps as your experiment nears completion, focusing on outcomes, follow-up actions, and potential for exploiting the results.

CHAPTER 6 > SHARE THE STORY:

Encourages you to share the narrative of your project, highlighting successful storytelling practices and showcasing a curated collection of artistic outputs.



Team Shoes in Circle - SME Tapi-1, a shoe producer in Poland, and their factory at work

Why Use This Toolkit

The **art-driven innovation methodology** begins with exploration and ends with implementation within the SME. By fostering cross-disciplinary collaboration, this toolkit **encourages innovative solutions and new ways of thinking, enhancing creativity, sustainability, and public engagement.** It provides a structured approach to tackle complex challenges creatively and innovatively, ensuring productive and impactful outcomes.

By following the tested methods and practical tips in this toolkit, you can embark on a journey of collaborative innovation, leveraging diverse perspectives and skills to create meaningful solutions. The experiences and lessons from the Better Factory project offer valuable insights for those interested in or participating in collaborative projects combining art and manufacturing to achieve industrial innovation.

How Can This Toolkit Be Used?

This toolkit is structured into the following chapters, as shown in the picture below (figure 1). It can be read in order as part of a process, but also picked and consulted individually according to needs:

OVERVIEW OF THE TOOLKIT:

This chapter provides a general introduction to the toolkit. It explains its purpose, which is to facilitate collaboration between industries and artists to foster innovation. It outlines the target audience, which includes small and medium enterprises (SMEs) and artists interested in collaborative projects. The chapter also provides guidance on how to navigate the toolkit effectively, detailing the structure of the chapters and the logical flow from one chapter to the next.

How it can be used

Use this chapter to get a quick understanding of the toolkit's functionalities. It helps you assess whether the toolkit suits your needs by providing a snapshot of its contents and objectives. By understanding the toolkit's layout and navigation tips, you can use it more efficiently and effectively to address your specific challenges.

CHAPTER 1 > FRAME A CHALLENGE:

This chapter guides you through the process of defining your industrial challenge. It includes step-by-step instructions on formulating the challenge effectively. The chapter emphasizes the importance of clearly articulating the problem to ensure a focused and productive project. It provides examples of well-defined and poorly defined challenges to illustrate the differences and help you understand what constitutes a good problem statement.

How it can be used

Use this chapter to refine your understanding of the problem you're trying to solve. By following the structured approach and reviewing the examples, you can ensure your challenge is clearly defined, which is crucial for finding effective solutions. A well-defined challenge sets the stage for successful matchmaking, team formation, and iterative cycles of experimentation.

CHAPTER 2 > FIND A MATCH:

This chapter emphasizes the importance of finding a good match between your industrial challenge and artistic expertise. It outlines the matchmaking process, detailing the steps involved and key matching points. The chapter provides examples of successful

matches to illustrate the concept and demonstrate how different artistic skills can address various industrial challenges.

How it can be used

Use this chapter to identify potential artistic partners who can contribute their unique skills and perspectives to your challenge. The matchmaking process helps you find collaborators whose expertise aligns with your needs, ensuring a productive and innovative partnership. By following the outlined steps, you can increase the likelihood of finding a compatible and effective artistic collaborator.

CHAPTER 3 > FORM A TEAM:

Building on the successful matchmaking process, this chapter focuses on team formation. It details the roles and responsibilities of various team members, including the artist, SME partner, potential additional collaborators, and the mentoring team. The chapter explores different levels and types of support available and provides strategies for achieving project goals. Examples are included to enhance understanding and illustrate different team structures.

How it can be used

Use this chapter to assemble a well-rounded team with the necessary expertise to tackle your challenge. Understanding the roles and responsibilities ensures that everyone knows their part in the project, promoting effective collaboration. The strategies for support and collaboration help create a productive working environment and set your team up for success.

Team STARIOT - Artist Gilbert Sinnott working with polyhedral shapes

CHAPTER 4 > ITERATION CYCLES:

This chapter delves into the core methodology of the toolkit: the art-driven experimentation iteration cycle. It explains the model, strategy, and iterative process employed in the Better Factory collaboration. The chapter describes how the methodology encourages continuous experimentation, learning, and progress, adapting to new insights and challenges as they arise.

How it can be used

Use this chapter to implement a cyclical approach to experimentation and learning. The iterative process helps manage the project dynamically, promoting continuous improvement and adaptation. By applying this methodology, you can ensure that your project

dynamically, promoting continuous improvement and adaptation. By applying this methodology, you can ensure that your project evolves based on real-time feedback and insights, driving innovation and achieving better results.

CHAPTER 5 > INNOVATION ROUTE:

As your experiment nears completion, this chapter guides you through the next steps. It focuses on outcomes, follow-up actions, and potential for exploiting the results. The chapter provides practical advice on how to leverage the findings, ensuring that the innovation cycle continues and the benefits of the project are fully realized.

Team Shoes in Circle - Artist Anka Walicka shows her final knitted shoe design

How it can be used

Use this chapter to plan for the post-project phase. It offers strategies to capitalize on your results, helping you make sustainable and impactful changes. By following the guidance on follow-up actions and exploiting the outcomes, you can extend the benefits of your project and maintain momentum in your innovation efforts.

CHAPTER 6 > SHARE THE STORY:

The final chapter encourages you to share the narrative of your project. It showcases a curated collection of artistic outputs that demonstrate the multiplier effect of these experiments. These results can be purely creative, speculative, or practical designs adopted by SME partners. The chapter emphasizes the importance of storytelling in contributing to the knowledge base of the Better Factory experiments and inspiring others.

How it can be used

Use this chapter to learn from successful storytelling practices and develop a compelling narrative about your project's journey. Sharing your story helps build a collective knowledge base, inspiring others and promoting further innovation. By showcasing your achievements and the impact of your work, you contribute to a broader community of practice and foster a culture of continuous learning and collaboration.

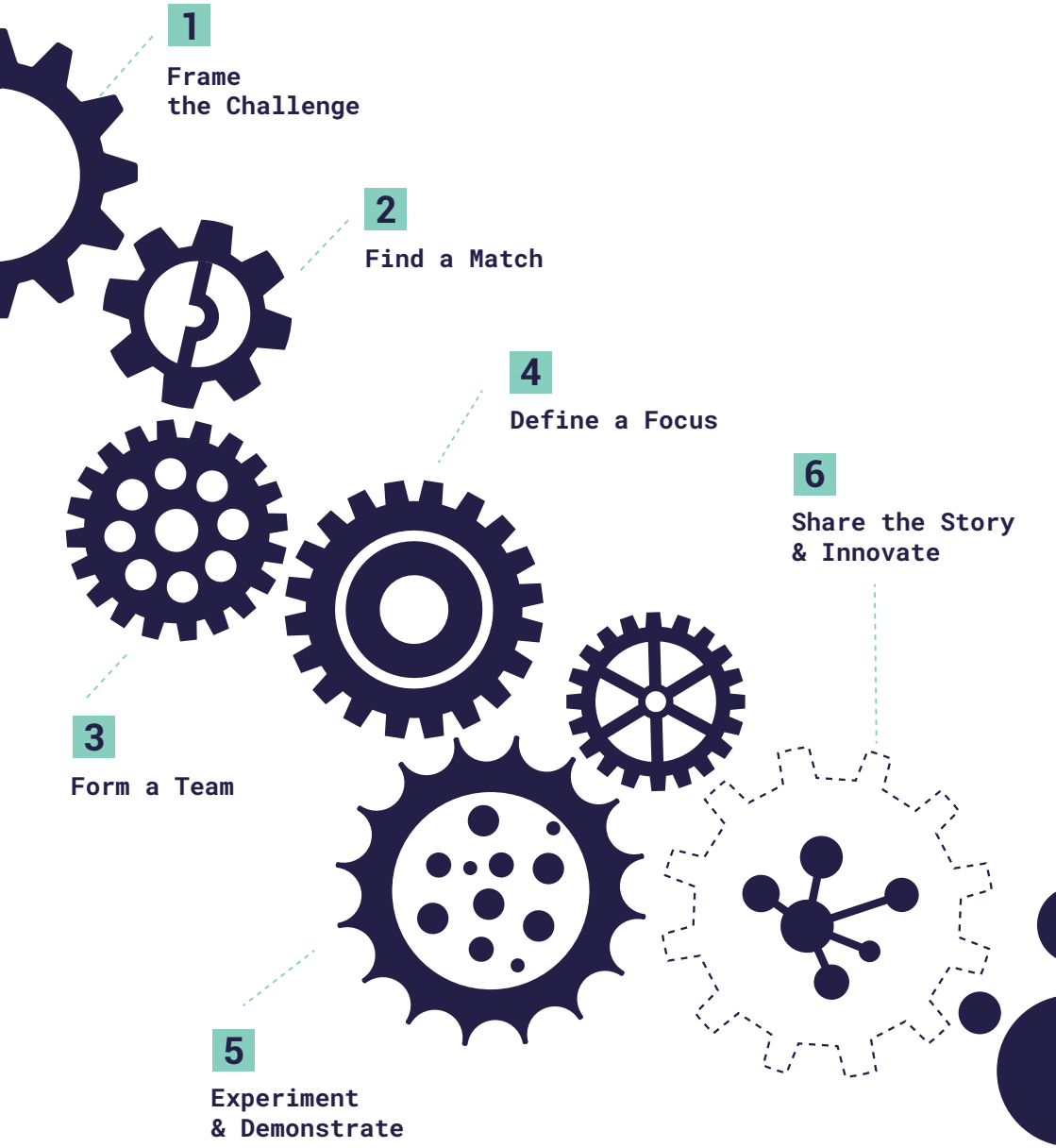


Figure 1 – Schematic overview of the Collaboration Process and Toolkit build up

Chapter 1

Framing the industrial / manufacturing challenge

Better Factory collaborations are formed around a challenge that is relevant for the SMEs involved. **The ultimate aim is to trigger an incremental or radical innovation cycle towards a 'better' manufacturing capability.** Starting with a manufacturing challenge ensures that the collaboration is grounded in real-world problems that require innovative solutions (low or hi-tech). It provides a clear focus and purpose, aligning the efforts of all collaborators towards a common goal.

Nevertheless, designing a strong challenge that is not only highly relevant for the SMEs involved but also interesting enough to inspire the collaboration with artists and tech providers requires care and pluralist thinking. These collaborations are engineered structures that consist of partners with diverse interests, organisational or individual cultures with different levels of expertise.

Better Factory's ideation cycle ensured that an open-ended guided process was in place for partners to understand, reflect and contribute to the making of the challenge. It started with **the premise that an industrial/manufacturing challenge** should not be closed from the beginning, but **should remain open until the collaboration process with the artist starts**, so they can be part of the solution, add their ideas and foster discussion about the topic.

Step by Step: How to formulate a [shared] manufacturing challenge?

A manufacturing challenge can be multidirectional. Often what is at the outset seen as a technology-related problem has implications on the SME's process, business model, commercial strategy, innovation, organisational capability, and even the largely overlooked aspect of organizational culture.

A 'shared' challenge formulation starts with the acknowledgment that **the goals and scope must benefit all partners involved** to some degree. This requires that the ultimate challenge is identified with a bottom-up participatory approach rather than being imposed on by a rigid framework externally.

The process of identifying a challenge starts as early as the expression of interest, however, this is a very rough cut of what develops as a collaborative challenge. Collaborative challenges evolve quite differently in a team setting where most often the members come together for the first time and most likely with no prior experience of having collaborated in a similar structure. Therefore, **each of the steps involved requires unconventional approaches**. In the early stages of ideation, the collaborations followed a three-step process.

Identifying core problems and objectives

This step included asking deeper level questions to help to uncover different layers of the 'identified' topic. The teams formulated the challenge from different angles, critically reflected on their implications and meaning in relation to the Key Performance Indicators (KPIs). At this stage multiple alternative routes are conceptually explored, including possible outcome expectations and scenarios.

Framing the challenge

Although the aim is to eventually establish a clear scope, framing a challenge early on in the experimentation phase involves setting the parameters or reasonable boundaries.

Ensuring relevancy

While these steps seem in linear order, this is a transversal mental exercise that takes place iteratively during the identification of core problems and framing.

In reflection of the seemingly logical steps above, it is important to note that crafting a meaningful challenge among a truly interdisciplinary team of diverse interest and expertise partners is an art more than science.

The key questions are:
Where does the intended outcome lie?
Who (among the partners) primarily benefits from the outcome?

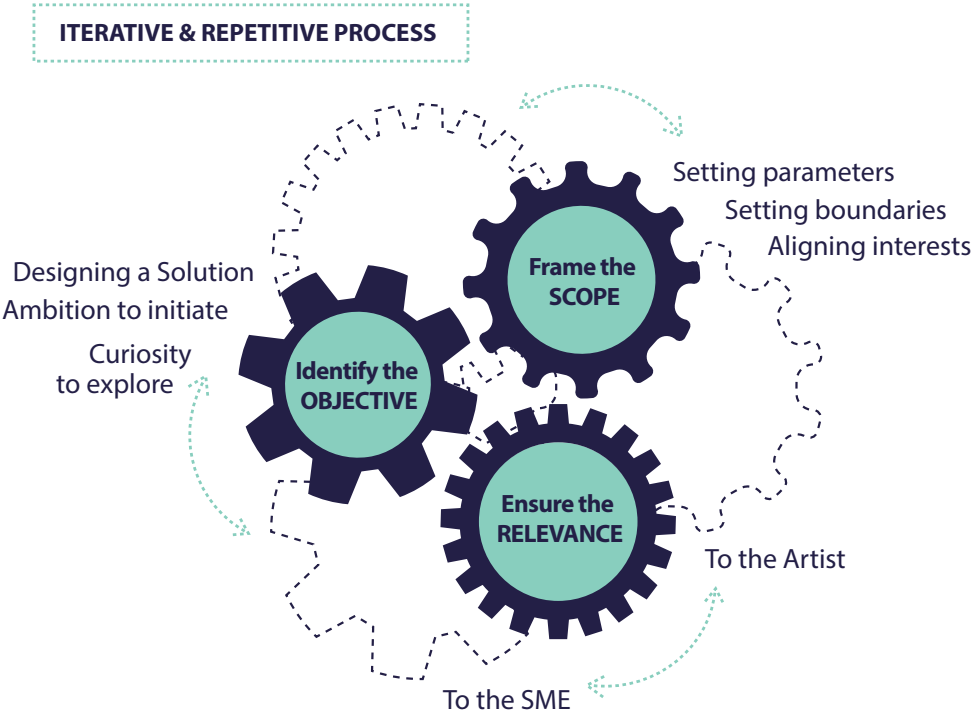


Figure 2 – Framing a challenge

The SME and the tech partner tend to frame high utility, high certainty challenges, which yield relatively limited scope. Artists tend to think more broadly. **It is equally crucial to understand what drives a challenge**. Is it a product, a process, an outcome, or a combination of these elements? Ultimately, collective reasoning can result in three types of challenges:

NARROW TECHNICAL FOCUS:
Designing a solution to a technical problem on a specific topic;

VISIONARY FOCUS:
Turning the ship (Blue Ocean2) / as an ambition to innovate / to stay

(2) Kim, W. C., & Mauborgne, R. (2005). Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant. Boston, MA: Harvard Business School

on top / be the leader: A process, a product with some level of understanding of need or input (particular technology, input>waste material, increase in productivity, sustainability etc.) and;

SPECULATIVE FOCUS:
A curiosity to explore a particular technological application / or material as a potentially innovative outcome as a breeding ground for forward-thinking / ethical considerations (wide).

! What is important to note is that **a challenge can be defined on all of these levels,** and a project can **transition from one level to the other** during the experimentation.

Partner Alignment

Another important consideration in challenge formulation is the **level of alignment among the partners**. Mind that one is an SME, one is a technology developer and one is an artist. There is no stressing enough that a natural outcome is not perfect alignment.

Possible outcomes of such ambition can be: **(a) no alignment; (b) limited alignment;** and **(c) symbiotic alignment**. The first two are what a team needs to work on the most. Through facilitation and mentoring, the partners are encouraged to look for complementarities instead of forcing complete alignment. It is important to remain open and provide space (later in the process) for alignment to emerge. Ultimately, alignment defines how the scope of the challenge is translated into a shared scope. Bluntly put - what is a good challenge vs. what is a bad challenge.

Challenge Checklist

✓	X
Specific Clearly defined with specific goals and objectives.	**Lacks clarity** Vague and not well-defined.
Measurable Outcomes should be measurable to assess progress and success.	**Unattainable** Beyond the scope or resources available to the team.
Achievable Realistic and within the capabilities of the team and budget.	**Irrelevant** Does not address a significant problem or need.
Relevant Address a significant issue within the industry.	**Too broad** Covers too wide a scope without a specific focus.
Time-Bound Have a clear timeline for achieving the goals.	**Lacks engagement** Fails to inspire or motivate the team.

S+T+ARTS Alignment

Lastly, a challenge must be situated in the S+T+ARTS context. After the selection of the collaborative teams, the Better Factory framework' encouraged team members to deeply assess their challenge and/or the technology. A good example of this is the **projects related to sustainability and circularity**. Being in the S+T+ARTS context necessitates asking critical even ontological questions about what is understood as circular or sustainable. The answer to such a question leads to alternative and equally pertinent directions such as solving the problem (i.e. waste) at the end or changing the process to eliminate waste in the process.

Following a rigorous design process to define the challenge will ultimately result in a **good and strong challenge** that yields a compelling story of innovation, and is often process-oriented, with a vision for possibilities, rather than a preconceived idea of a product.

Team 3DARTDESIGN - Artist Nick Ervinck's pen design

< Case Study >

Anatomy of MICOCRAFT and STARIOT's challenges

MICOCRAFT

Solution	Innovation	Curiosity to explore
Mycelium panels and molds	Post processing, natural and biomimicry surfaces	Mini micro factory design – Collective manufacturing

MICOCRAFT's challenge was collectively developed following a close-knit collaborative process between the artist, the SME and the tech provider. The team managed to meet physically early on in the design of the challenge while preparing the proposal. The vision of the artist was the driver, while the technology of the SME grounded the scope of the challenge in a particular application. The challenge and the mission-driven aspects of the project were connected strongly, therefore offering a narrow and broad scope challenge spectrum. The tech provider walked into the challenge with an open mind, nurturing the curiosity to explore and pushing the limits of the technology platforms along with the artist.

MICOCRAFT's challenge evolved in different directions even after the ideation and challenge formulation phase. This provided the team with many routes to explore, at times posing minor risks of losing focus and being overambitious but with careful mentoring and guidance, which involved scenario analysis, work plan structure planning, visualizations, the challenge resulted in the creation of both immediate applications and high potential speculative designs that bred new design challenges.

Symbiotic alignment between partners:

Team MICOCRAFT - Work by Artist Sebastien Wierinck (OnSite Studio)

STARIOT

Solution	Innovation	Curiosity to explore
Digital tools, diagrams and instructions using drinking straw production waste	Polyhedral forms built using the raw material and connections	Polyhedral modelling for STEM education and architectural simulation

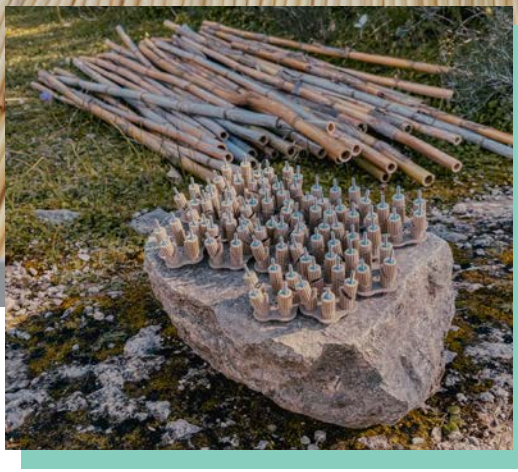
The STARIOT team benefitted from the guidance provided by Better Factory in formulating their challenge. The SME's clear need to automate processes and reduce waste created a strong connection with the technology provider, leading to effective solutions. However, aligning the artist with this practical goal proved more challenging. While the SME had a straightforward, practical approach aimed at advancing their STEM project, the artist sought to explore multiple possibilities and maintain creative freedom.

To address this, the strategy adopted was to split the challenge into two complementary parts: the challenge-driven project, where the artist collaborated closely with the SME and tech provider, and the mission-driven project, allowing the artist greater creative freedom. This dual approach facilitated the exploration of solutions in different ways while maintaining a link to the SME's original objectives.
In the challenge-driven approach, the artist created digital tools, diagrams, and instructions for constructing polyhedral shapes from straw waste, supporting the SME's goal of creating educational kits. The mission-driven approach allowed the artist to develop reusable connectors for constructing sculptures from tube-like materials such as giant reeds. These connectors, made from recycled and compostable materials, ensured secure fastening and attachment for large-scale structures.

Despite the initial lack of strong alignment between the SME's practical goals and the artist's broader vision, the flexibility provided by the mission-driven approach led to a diverse range of productive outcomes. Both approaches benefitted from a digital web app and development infrastructure for exploring interactive polyhedral and geodesic models. This platform enabled the design and testing of new structures before construction and aided in generating diagrams, measurements, and instructions.

Limited alignment between partners:

Team STARIOT - The collection of wheat stems for SME Staramaki's natural drinking straws



Team STARIOT
Photo by artist Gilbert Sinnott

Summary

Framing a challenge is a **highly iterative process**. Depending on the type of alignment between the partners these cycles require different levels of involvement and intervention by mentoring. None of these alignments are inherently right or wrong, they just need to be acknowledged and appropriately attended to. The ultimate aim of framing a smart challenge in order to initiate a meaningfully diverse collaboration, involves the **right balance of closed-ended and open-ended challenges** that feed into informed, productive experiments in the following cycles.

Chapter 2

Finding a Match

Following the understanding of how to frame a good challenge, this chapter presents the process of finding a collaboration match, emphasizing the importance of a good match (and what this means), the role of mentors, and some lessons learned from the experience gained in Better Factory.

The matchmaking moment is when collaboration teams start to form ("art + industry" or even "art + industry + tech" as established in Better Factory project). In this step, a common ground should be established for the collaborations. The **matchmaking process involves matching the industry's challenges with the artist's interests and skills**. However, a good match always needs a spark, so team members need to meet first.

Why matchmaking?

Matchmaking is crucial for establishing common ground, particularly important when there is no history or experience in this type of collaborations before. Successful SME + Artist collaborations are built on a strong foundation, much like constructing a house. The matchmaking process is essential for onboarding, involvement, and dentifying the 'igniting questions' to start the collaboration. The final proposal a team submits (if applying for an open call for proposals) is a result of an efficient matchmaking process.

What is the role of mentors?

Mentors play a critical role in **supporting the formation of a future collaboration team** by asking SMEs what they want to achieve and artists what they are looking for. With this information, along with the artist's working experience and capabilities, the matchmaking process can start, finding "the right lid for the pan", meaning the most suitable match.

Building this fitting infrastructure consists of both process and culture. The process side of the infrastructure can and should be co-created by the mentors and the collaborative team members, while the culture side of the infrastructure is the result of effective matchmaking:

PROCESS	**Scale of the experiment**	*Is the ambition high yet realistic?*
	Duration and speed	*How long and intense will it run?*
	Team involved	*Which ecosystem is around the collaboration?*
	Support	*Can support be provided for finance, assets, knowledge?*
	Standards	*What is the pre-defined quality criteria?*
CULTURE	**Shared values**	*Do the Artist and SME share the same values on how to work?*
	Competences/skills	*Does the Artist bring the right competences to explore the igniting question successfully (meaning leading to a conclusive outcome)?*

The presence of mentors is essential at this stage, acting as facilitators, advisers, reviewers, supporters, and providers of scope alignment and relevance towards a common goal. In chapter 3, the role of mentors is described in detail.

Goals of Matchmaking

The primary goal of the matchmaking process in the Better Factory project was to establish productive, creative, and practical collaborations between SMEs and artists. This process ensures that the challenges faced by SMEs are effectively addressed through innovative solutions provided by artists. The objectives include:

ESTABLISHING COMMON GROUND: Ensuring both parties understand and align on the challenge.

FACILITATING EFFECTIVE COMMUNICATION: Promoting clear and open communication channels between SMEs and artists.

CREATING BALANCED TEAMS: Forming teams with complementary skills and perspectives.

ENSURING FEASIBILITY AND COMMITMENT: Making sure both parties are committed and that the collaboration is feasible within the project's scope and timeline.

Factors to Consider

Successful matchmaking requires attention to several critical factors to ensure compatibility and productive collaboration:

CHALLENGE FIT: Ensuring the artist's skills and interests are aligned with the SME's challenges.

EXPERIENCE AND EXPERTISE: Considering the artist's previous collaboration experience, sector familiarity, and material expertise.

CULTURAL AND LANGUAGE COMPATIBILITY: Ensuring effective communication and mutual understanding.

SHARED VALUES AND GOALS: Aligning the artist's and SME's values and objectives.

SUPPORT AND RESOURCES: Availability of necessary resources, financial support, and access to knowledge and networks.

Team OCD3D - Artist Gareth Neal's open weave structures. Photo by James Champion

Step by Step: How to run a matchmaking process?

The main learnings for this toolkit come from past experiences in S+T+ARTS projects and two matchmaking rounds during the Better Factory project. Based on these experiences, we have identified the following steps as the most effective approach for facilitating successful collaborations:

1. **EXPRESSION OF INTEREST (EOI):** Collect detailed EoIs from both artists and SMEs, clearly outlining challenges and interests.
2. **PRE-SELECTION:** Conduct a thorough pre-selection process to evaluate eligibility and alignment with project goals.
3. **INFORMATIONAL SESSIONS:** Hold webinars or informational sessions to provide participants with a comprehensive understanding of the project.
4. **STRUCTURED MATCHING**: Use detailed criteria to create a refined list of potential matches, ensuring alignment in skills, interests, and goals.
5. **FACILITATED MATCHMAKING EVENTS:** Organise structured matchmaking events, such as speed dating sessions, to enable initial interactions and assess compatibility.
6. **FINALIZING MATCHES:** Allow SMEs and artists to finalise their matches through guided discussions and follow-ups.
7. **PROPOSAL DEVELOPMENT SUPPORT:** Provide resources and support for teams to collaboratively develop their project proposals.
8. **ONGOING MENTORSHIP:** Offer continuous mentorship to support the collaboration, address challenges, and ensure alignment with project objectives.

These steps are designed to foster effective and innovative collaborations between artists and SMEs, driving both creative and practical outcomes while ensuring a structured and supportive matchmaking process.

Strategies applied through the process:

 **TEMPLATES**	**Informing**	*Facilitating documented and structured information exchange moments*
 **COMPATIBILITY**	**Criteria-Informed Matching**	*Using informed matching based on specific criteria to increase compatibility.*
 **INTERACTION**	**Speed Dating**	*Implementing structured yet rapid matchmaking sessions to encourage initial interactions and compatibility assessments.*

Main learnings:

The key learnings from matchmaking are **to facilitate speed dating sessions** for effective information absorption, provide templates for EoI, Challenge Design, and Proposal, encourage collaboration during the proposal writing phase, and offer small incentives for matched teams to write proposals and hold physical meetings, as pre-project in-person interactions led to better collaborative experiences.

These insights and structured processes aim to foster effective and innovative collaborations between artists and SMEs, driving both creative and practical outcomes.

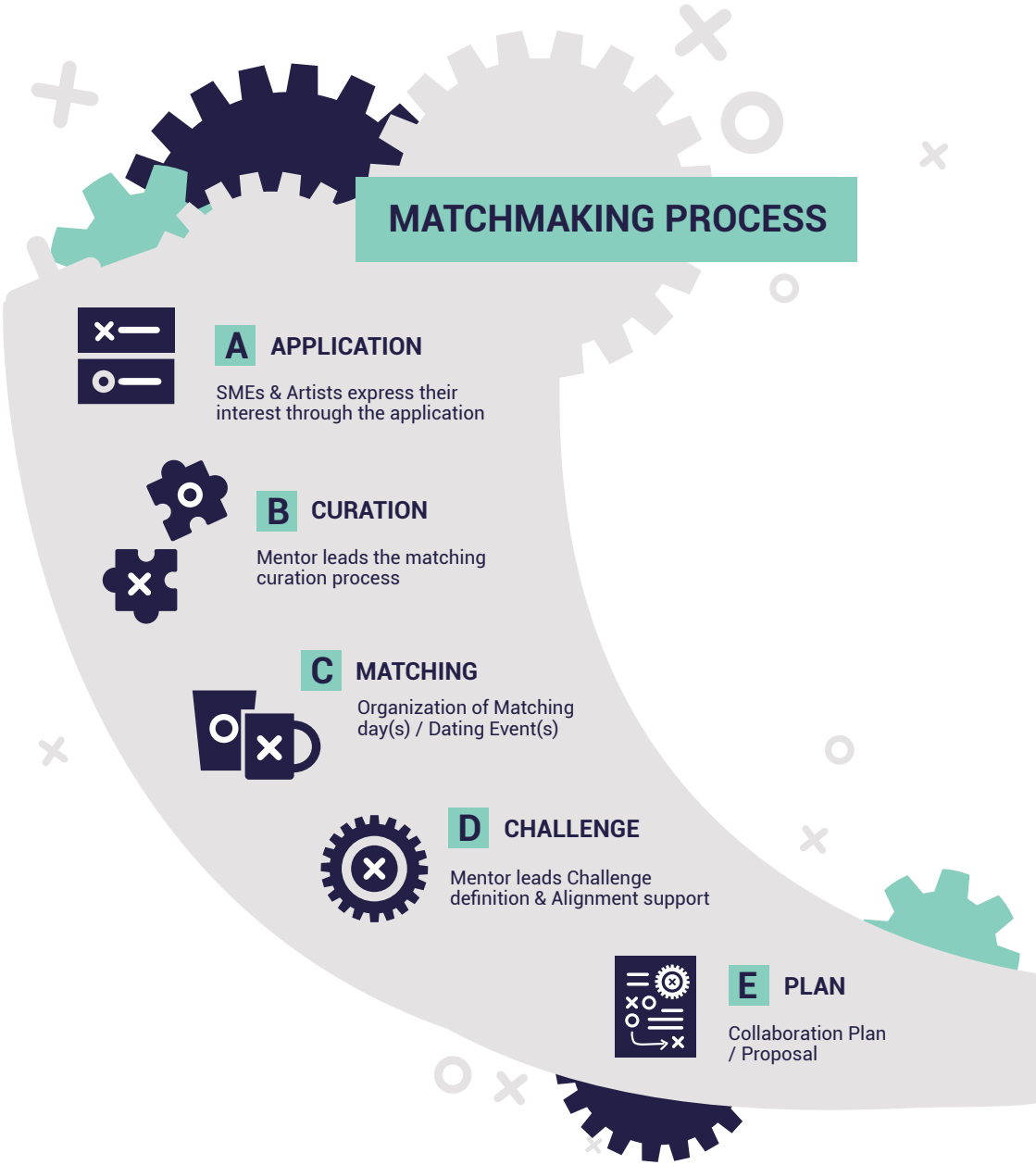


Figure 3 – Matchmaking process

Chapter 3

Forming a team and the importance of mentoring

"The true mentor, like a midwife, does not give birth to wisdom but helps to bring it out"

- paraphrasing of ideas presented by Socrates in Plato's dialogue Theaetetus.

After the matchmaking process, **SME and artist collaborations require mediation and planning** to initiate and establish the core team. A team naturally comprises different actors, which in this context includes at least: (a) the SME; (b) the artist and support structure; and (c) mentors from the fields of art, business, and technology. The essence of an art and industry collaboration lies in its multidisciplinary and multi-perspective nature, bringing together various skills, perspectives, and expertise.

Forming the Team

A critical step in forming the team is **preparing the participants' minds** - establishing what to expect and how to prepare for fruitful interactions and initial dialogue by creating a common ground. This foundation is essential for understanding the participants' different needs, ambitions, and visions. Finding this commonality, and

understanding the identities and perspectives of all involved, helps formulate the core team. To achieve this, the mentor(s) play a crucial role, as has been extensively discussed in chapters 1 and 2.

Role of Mentoring

Mentoring is a valuable component that enables collaboration. Mentors provide guidance, direction, support, and challenging questions for the team. The mentor's support functions as scaffolding that **keeps the two-party collaboration together, aligned, and on track**. Mentors can take **different positions**, from standing behind, to stepping in the centre. Figure 4 demonstrates the different roles identified, which the mentor navigates between throughout the collaboration. For ease of understanding, we focus on the collaboration between the artist and the SME, but in case of additional partners in the team, like a technology provider, the role of the mentor stays the same since it is focussed on the position the mentor takes towards the mentees. Each role is explained below.

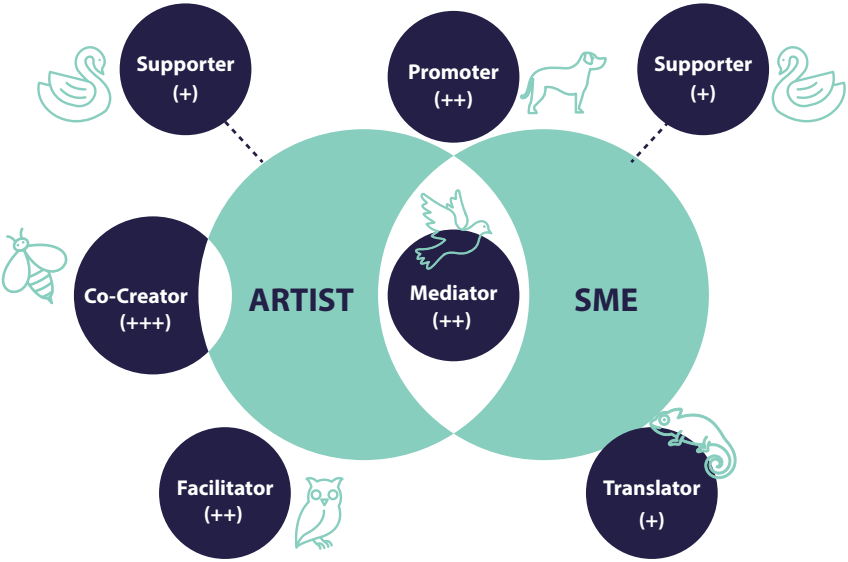


Figure 4 - Mentoring Roles, Positions and Intensity (level of +)

Mentoring Roles, Positions and Intensity

We have identified **six different positions** that mentors can take throughout the collaboration. Each role describes a core position of the mentor towards the collaboration. The (+) reflects the mentoring intensity in terms of effort/involvement level. Note that the mentor **can switch roles throughout the collaboration**, depending on the needs at hand.

(+) SUPPORTER

Acting as a sounding board for ideas, approaches, and solutions. They question methodologies and work plans towards the goal, supporting artistic research by sharing interesting works, research, technology, and methods.

(++) FACILITATOR

Providing guidance and counselling, facilitating relationships and critical discussions, and offering access to networks for additional expertise.

(+++) CO-CREATOR

Actively co-creating by identifying ideas, forming approaches, being a true extension of the team, playing an active role in decision-making, and refining needs assessment and solutions.

(+++) MEDIATOR

Relieving bottlenecks and managing conflict resolution between the artist and the SME.

(++) PROMOTOR

Keeping the team on track by monitoring progress and reporting, pushing for innovation, achieving collaboration goals, and providing support in project management and milestone achievements.

(+) TRANSLATOR

Managing expectations, aligning multiple interests, and translating artistic concepts into business vocabulary. Often, mentors need to explain artistic components or the artist's work extensively to the SME.

The mentoring role, position, and intensity can vary throughout the collaboration. The mentor may step back at times, while at other times, they may take a more active co-creator role. The mentoring programme should be designed with the **flexibility to adapt to the team's needs.** Mentors can wear different hats to move the collaboration forward, pushing results in terms of innovation, value, and market fit.

Forming the Team: Understanding Collaboration Intent and Value Drivers

Understanding the collaboration's intent and making the value drivers explicit is crucial. This process involves **initial meetings** (preferably in person), **soft skills,** and **simple process-tracking tools**. It's vital to ensure all parties are actively participating and keeping core team members aligned with final objectives and goals. Mentors can facilitate both formal interactions (e.g. set agendas and regular meetings, document processes) and informal interactions (e.g. spontaneous discussions, brainstorming sessions).

Strategies for Effective Collaboration

In any collaborative project, particularly those involving diverse stakeholders such as SME-Artist collaborations, the complexity of managing different perspectives, skills, and goals can be challenging. By **clearly defining roles, scheduling regular check-ins, utilising progress tracking tools, establishing accountability mechanisms, fostering open communication,** and **preparing the minds**

of all participants, these strategies can be used as a framework.

At the outset of the collaboration, it is crucial to clearly **define and document** each party's roles and responsibilities. Hence, clear role definitions are crucial. This ensures everyone understands their specific contributions and areas of accountability. This documentation should be shared with all team members and referred to throughout the project to prevent role confusion and overlap.

Team OCCE - Artist Govert Flint's chair prototype using wood

Role definition tips:

- Create a detailed **role matrix**.
- Hold an **initial meeting** to discuss and agree upon roles.
- Regularly **revisit and update** the role definitions as the project evolves to create space for fluxing roles as needed (enable switching between modes of thinking, not accountability).
- Schedule **consistent meetings** to review progress, address challenges, and recalibrate goals as needed. The frequency of these check-ins should align with the project's timeline and complexity — ranging from weekly to monthly.

Implementation tips:

- Use a standardised **agenda** to streamline meetings.
- **Rotate** the meeting facilitator role to involve different team members.
- Set **clear action items and follow-up tasks** at the end of each meeting.

Utilize project management tools and **progress tracking tools** to monitor tasks, deadlines, and overall progress. These tools provide transparency and allow all parties to see who is responsible for what and the status of each task:

- Set up a **collaborative working environment**, such as Project place, Slack, or Trello or a customised tool to fit the project's specific needs.
- **Train** all team members on how to use the tool effectively.
- Ensure **regular updates** are made to the tracking tool.

Establish clear **accountability measures** such as performance reviews based on Key Performance Indicators (KPIs), regular progress reports, and dashboards highlighting individual and team contributions. This maintains momentum and ensures responsibilities are met:

- ✓ Develop and agree upon specific **KPIs** at the start of the project, which can be part of the Individual Mentoring Plan/ Innovation monitoring plan (*See Annex 1*).
- ✓ Create a **reporting schedule** and format.
- ✓ Use **visual dashboards** to provide at-a-glance progress updates.

Foster an environment of **open communication** where team members feel comfortable discussing challenges, delays, and successes. Regular meetings, spontaneous check-ins, and multiple communication channels support this:

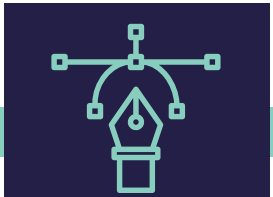
- ✓ Encourage a culture of **transparency and trust.**
- ✓ Set up a **communication plan** outlining preferred channels and frequency, e.g. (email, WhatsApp, phone, physical meetings).

Lastly, the mentor can **prepare the minds of the team** for collaboration, by making explicit assumptions and reference models related to the collaborators.

- ✓ Discuss the following **elements**: communication language, strategy and business model, available resources, interests and expectations (e.g., goals, quality standards, IP – for this also see chapter 5 in this toolkit), available knowledge, skills, experience, and expertise, and working culture and relationships.
- ✓ Regularly **revisit** these discussions as the project progresses.

IImplementing these above strategies will give **insights into the collaborative ecosystem**, helping to identify the specific networking and expertise needed for external support. It will also spotlight how the mentor is part of the team, to leverage diverse skill sets and knowledge bases, and consequently enhance the collaboration's outcomes.

These strategies ensure that all team members are engaged, informed, and working towards the same objectives, ultimately leading to a more **effective and innovative collaboration**. This structured approach facilitates better project management, improved communication, and enhanced problem-solving capabilities, fostering a collaborative environment where creativity and business objectives can harmoniously coexist.



ARTIST MENTOR

Guides artists to develop creative solutions while challenging artistic and conceptual development. They work primarily with artists, ensuring the artistic intent aligns with SME's goals, while maintaining artistic freedom.

BUSINESS MENTOR

Supports the development of a business plan for the collaboration's long-term sustainability. They focus on ensuring the differentiation and value proposition of the collaboration achievements, and guide discussions on IP and outcomes.

TECH MENTOR

Guides technical implementation, resolves technical issues, and ensures the solution is state-of-the-art. They involve additional experts as needed to fill technological gaps.

Mentoring Structure Advice:

Given the different positions a mentor must take during collaboration, a **broad skill set** is essential. The suitable mentoring structure needs to be considered at the beginning of the collaboration.
We identified two different levels:

1 TEAM LEVEL, or single Artist + SME collaboration

Have a multi-skilled lead mentor qualified as an artist's mentor, with satellite mentors for case-specific support.

2 PROGRAMME LEVEL (within a project like Better Factory)

For this level, we introduce an additional mentor role: the mentor coordinator. This means, that the programme can tap into a pool of available mentors in the programme (satelite mentors), based on the different skills and particular expertise.

The **mentor coordinator** coordinates across teams, takes the lead when the mentoring roles of **Dove**, **Dog**, and **Chameleon** are required and supports alignment between mentors. Satellite mentors work directly with artists, taking the lead in specific positions and suppor- ting others. The satellite mentor can be directly coupled with the artist to take the lead in roles **Swan**, **Owl**, and **Bee**, and provide support in roles **Dove**, **Dog**, and **Chameleon**. In this setup, the art mentor can implement continuous mentoring support for artists, maintaining close communication to monitor progress and provide insights. This helps achieve the artists' individual goals while ensuring alignment with the SME's challenges and overall requirements and expectations.

< Case Study >

Mentors within teams REFINE and OCCE

The Mentor as a Mediator

It is not surprising that the minds of artists and SMEs are not similar. While this is the main power of collaborative processes overall, in some cases they go through a process of alienation instead. When this happens, the mentor is required to take the role of Mediator between the parties with the aim to build understanding and reciprocity through translation and mediation. In the project **REFINE**, this was required to create space for the artist Javier Masa to take issues in diving as a starting point to develop prototype relievers to these issues. Where initially the SME, SEAC, considered this approach undesirable, the mentor succeeded in mediating this situation. At present, artist and SME proudly associate their names to the Artifacts for a Scuba Diving Utopia.

The Mentor as a Co-Creator

Sometimes it is needed for a mentor to step inside the artist circle and become an extension of the artist, in the sense that the mentor Co-creates (a part of) the project. In the project **OCCE**, this happened when developing the AIR Chair prototype. Artist Govert Flint and mentor Margharita Soldati set up a collaborative workshop where they together experimented, tested and explored various ways in which air can be used as a filler for ergonomic seating. This act of co-creation helped the artist to make those decisions necessary to develop a full prototype air based chair.

Team OCCE - Artist Govert Flint's chair design using air as a material

Team REFINE - Artist Javier Masa's fin design work

Chapter 4

Iteration Cycles

Now that you have explored how to Frame a Challenge, Find a Match, and Form a Team, we are ready to delve into the Iteration Cycles. This core chapter focuses on running the experiment itself — from defining a focus, to experimenting, to demonstrating. It explains the methodology of the art-driven collaborative iteration cycle (model, strategy, iteration cycles) that was employed within the Better Factory project, and can be applied to similar contexts.

The Collaborative Iteration Cycle

The collaborative iteration cycle involves four steps — **1) Ideate; 2) Prepare; 3) Build; 4) Learn** — repeated three times throughout the collaboration project.

Each cycle has a distinct focus and goal:

1 IDEATION (Cycle 1)

- **Define a Focus:** Discover and interpret how the mission and challenge will be put into action.
- **Goals**: Establish strong relationships, analyse the scope of the project to ensure feasibility, define prototypes, and align Key Performance Indicators (KPIs) with the SME's goals.

2 ITERATION (Cycle 2)

■ **Experiment and Refine**: This middle cycle is where most of the experimentation happens.

■ **Goals**: Transition from theoretical discussions to practical testing, validate the feasibility and effectiveness of ideas, and ensure the project maintains direction and coherence.

3 DEMONSTRATION (Cycle 3)

■ **Final Implementation**: All experiments culminate in a wrap-up moment, with a solution or result finally demonstrated. This can be a prototype or more advanced if referring to a Technology Readiness Level (TRL).

■ **Goals:** Prepare a demonstrator, showcase the working model in its intended environment, and finalise the outcome.

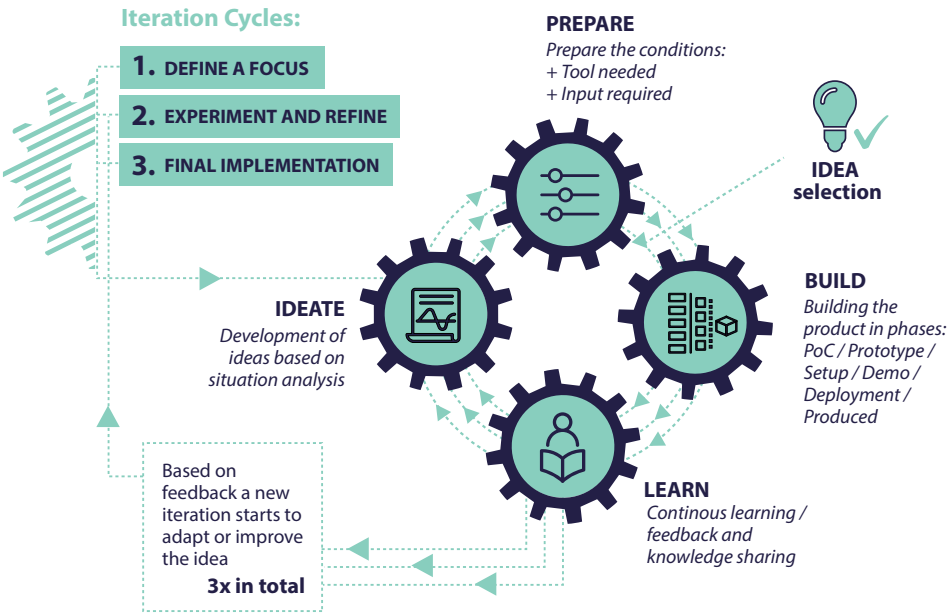


Figure 5 - Illustration of the iteration cycle model.

Flexibility and Strategies for Implementation

Each cycle allows for flexibility to accommodate different strategies to carry out Challenge and Mission projects. Here are some possible strategies for project implementation:

First Challenge, then Mission: Start by addressing the specific challenge and then transition to broader mission-driven goals.

Parallel: Work on the challenge and mission simultaneously, ensuring they inform and support each other.

Blending: Integrate challenge-driven and mission-driven approaches from the outset.

First Mission, then Challenge: Begin with broader mission-driven goals and narrow down to specific challenges.

Challenge-driven Project The challenge-driven part of the artistic project within the collaboration will be aimed at conceiving, prototyping, and testing a new or adapted product/service or process portfolio, with the goal of adding the result to the offerings of the SME after the collaboration ends.

Mission-Driven Project The mission-driven part of the artistic project will allow the artist to conceive a speculative future scenario for the SME in line with their mission. This scenario can result in a concept with or without experiments and/or a (set of) prototype(s) to visualise a future scenario.

We will also explore the reasons for these strategies' existence and how they can be applied effectively.

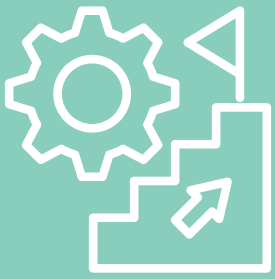
Recommended Timeline

In the Better Factory project, each cycle lasted four months, resulting in a total experiment duration of 12 months. This timeline ensures that all the steps for a complete cycle are undertaken effectively: Ideate, Prepare, Build, Learn.

Detailed Subchapters

In the following subchapters, you will find details on the **three cycles** of the experiment:

4a	4b	4c
IDEATION	**ITERATION**	**DEMONSTRATION**
Focuses on defining a clear project scope, building strong relationships, and sketching initial prototypes.	Emphasises practical testing, validating concepts, and refining prototypes based on feedback.	Concentrates on finalising and demonstrating the solution, evaluating outcomes, and preparing for potential implementation or further development.



By following this structured yet flexible approach, the Better Factory method promotes **continuous improvement and adaptation**, ensuring that projects evolve dynamically and achieve innovative results.

Iteration • Cycle 1:
Focus Definition

In the initial cycle of the ideation process, we aim to define a clear focus for the project. This phase is crucial as it builds the foundation for all subsequent actions.

The primary goals include establishing strong **relationships** and mutual understanding among the Collaboration members, **scoping out the project** to ensure feasibility, **defining prototypes**, and **aligning Key Performance Indicators (KPIs)** with the goals and needs of the SME.

Achieving these objectives will require addressing several challenges, including the decision-making process, overcoming communication barriers, developing a common project language, evaluating ideas for their relevance and excitement, and regularly reflecting on progress and feedback.

Objectives:

1 **DEFINE A CLEAR FOCUS FOR THE PROJECT:**
Identify and articulate core objectives and goals. Create a detailed project definition or road map outlining scope, objectives, and expected outcomes to align all activities and decisions with ultimate goals.

2 BUILD STRONG RELATIONSHIPS AND MUTUAL UNDERSTANDING AMONG ALL COLLABORATION MEMBERS:

Establish trust and open communication through regular meetings (online/in-person), knowledge sharing sessions, mentorship and peer reviews. Use effective collaboration tools (e.g. Miro) to facilitate communication and information sharing, promoting transparency and inclusiveness.

3 SCOPE THE PROJECT TO ENSURE FEASIBILITY:

Define the project's boundaries, including tasks, resources, timelines, and potential risks. Use feasibility studies, risk assessments, and resource planning to confirm practical implementation. Clear scope prevents project drift and ensures focus.

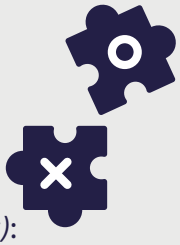
4 SKETCHING PROTOTYPES:

Create early models of the project's product(s) or solution(s) for testing and evaluation. Iteratively refine prototypes based on feedback to identify early potential issues and ensure the final product(s) meets SMEs' needs and expectations.

5 ALIGN KEY PERFORMANCE INDICATORS (KPIS) WITH THE GOALS AND NEEDS OF THE SME:

Select KPIs that reflect the specific goals and needs of the participating SME. Consult with SME stakeholders to understand their priorities. Ensure KPIs are measurable, achievable, relevant, and time-bound. Regularly monitor and report on KPIs to assess progress and make informed decisions, ensuring the project delivers tangible benefits to SMEs.

Challenges:



1 DECISION-MAKING

(Ensuring all parties can contribute and agree on decisions):

Facilitate an **inclusive decision-making process** where all Collaboration members feel heard and valued. To ensure a collaborative and cohesive approach, it's essential to create an environment where every participant can voice their opinions and concerns. This involves **organising regular meetings and ensuring transparency** in the decision-making process. It's important to foster a culture of respect and active listening so that all parties feel their contributions are considered seriously.

2 MUTUAL UNDERSTANDING

(Overcoming communication barriers and ensuring everyone is on the same page):

Address language, cultural, and professional differences to achieve clarity and consensus. Effective communication is crucial for the success of any collaborative project. This involves recognising and bridging language barriers by **using a common 'lingua franca'.** Cultural and professional differences should be acknowledged and respected, with efforts made to educate team members about these differences to prevent misunderstandings. **Regular check-ins** and clarifications can help ensure that everyone understands the goals, processes, and expectations.

3 TRANSLATION AND TAXONOMY CREATION

(Developing a common language or framework for the project):

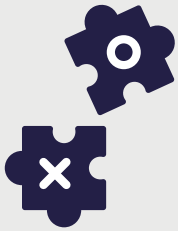
Create **shared terminologies** to avoid misunderstandings and streamline communication. Establishing a standardised vocabulary is vital for clear communication. This involves developing glossaries of

Team 3DARTDESIGN - Artist Nick Ervinck´s trophy design

terms, defining key concepts, and creating documentation that all team members can refer to. This shared framework helps in aligning everyone's understanding and ensures that all discussions are grounded in the same conceptual framework, reducing the risk of miscommunication.

4 OPTION ANALYSIS

(Evaluating different ideas for their relevance and excitement among partners):



Assess the viability and enthusiasm for various concepts to identify the most promising directions. This involves **systematically revie- wing and analysing all proposed ideas based on their feasibility,** potential impact, and the enthusiasm they generate among the Collaboration members. Prioritise concepts that align with the project's goals and have strong support from the team will help in focusing efforts towards the most promising directions.

5 REFLECTION

(Regularly assessing progress and feedback to refine ideas):

Continuously review and adapt the project's approach based on ongoing input and results. Reflection is an ongoing process that involves regularly reviewing the project's progress, collecting feedback from all Collaboration members, and making necessary adjustments. This can be achieved through **review meetings, progress reports, and feedback sessions**. By maintaining a flexible and adaptive approach, the project can respond to new information and changing circumstances, ensuring continuous improvement and alignment with the project's objectives.

The Focus Definition phase is a critical step in the ideation cycle, serving as the groundwork for successful project development. By setting a clear focus, fostering strong relationships, ensuring project feasibility, defining prototypes, and aligning KPIs with SME goals, we can create a robust project framework. Through collaborative efforts and continuous refinement, we aim to establish a project that is both innovative and aligned with the needs of all stakeholders.

< Case Study for Cycle 1 >

Team FOLD - Artist Isaac Monté - Stone printed giant clams

1. Artist ISAAC MONTÉ and team FOLD

Prototype (Challenge-Driven Project)

Isaac Monté, the artist leading this phase, focused on addressing the specific needs of SMEs that produce grow tubes for vineyards.

PRIMARY OBJECTIVES

Create Different Designs/Prototypes	Monté developed various designs and prototypes of grow tubes to meet SME needs, particularly in automating grow tube production. This effort aimed to increase production capacity and improve the gluing process of Stone Paper.

Redesign Grow Tubes	The grow tubes were redesigned with two main goals: **a. Improved Functionality**: Enhancing the strength and durability of the grow tubes to ensure better performance. **b. Automation Compatibility**: Modifying the design to enable production by collaborative robots ('cobots'), facilitating the automation of the production process.

By the end of Cycle 1, Isaac Monté successfully reached the proof of concept demonstrating the feasibility of his designs and their potential for automated production.

Mission (Mission-Driven Project):

The mission-driven aspect of Cycle 1 aimed to expand the application of Stone Paper and develop new products that could diversify the SME's market presence beyond the packaging industry.

KEY EFFORTS

Develop New Product Applications	Monté explored various ways to use Stone Paper, experimenting with the raw material and different production techniques to create innovative products.
Recycle and Reuse Cutting Waste	A significant focus was on finding sustainable solutions to manage waste generated during production. Monté developed a method to recycle and reuse the cutting waste from Stone Paper, which typically ends up as trash during the production process at the SME (Europack Bulgaria).

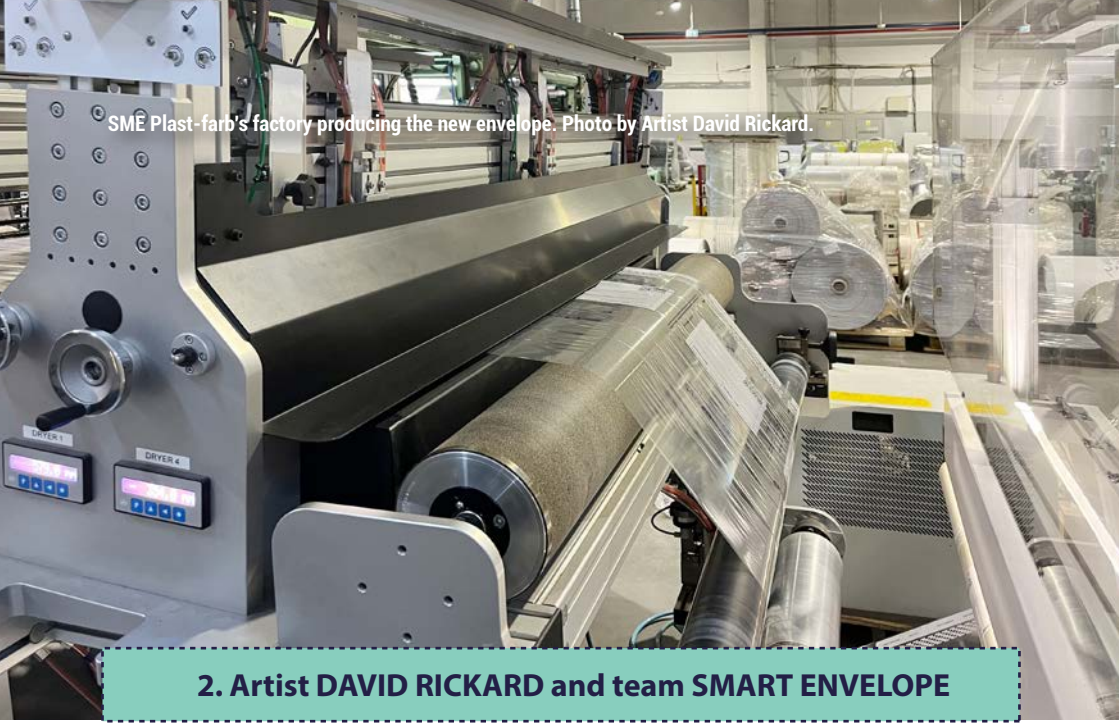
Innovative Results

One of the notable achievements was the creation of a recipe to reuse Stone Paper waste, aligning with the goal of sustainability and resource efficiency.

CONCLUSION

In Cycle 1, Isaac Monté successfully advanced the project through a dual approach of challenge-driven and mission-driven initiatives. By developing prototypes and redesigning grow tubes for improved functionality and automation compatibility, Monté addressed key SME needs. Simultaneously, he explored new applications for Stone Paper, including sustainable methods to recycle production waste. These efforts laid a strong foundation for the project's subsequent phases, demonstrating the potential for innovation and sustainability in both product design and production processes.

Team FOLD - A close up of Artist Isaac Monté's stone printed shells



SME Plast-faro's factory producing the new envelope. Photo by Artist David Rickard.

2. Artist DAVID RICKARD and team SMART ENVELOPE

Prototype (Challenge-Driven Project)

Artist David Rickard focused on developing an innovative and sustainable product to address waste reduction and enhance customer engagement.

PRIMARY OBJECTIVES

Developing a Reusable Physical Envelope	Rickard created a new type of envelope that could be reused multiple times (reversible), significantly reducing waste associated with traditional single-use envelopes.
Integrating a Smart Feature	The envelope was enhanced with a smart feature, linking it to a database for collecting customer feedback and information. This feature aimed to improve customer interaction and gather valuable data.

Design and Review	Rickard played a crucial role in the design and review process of the physical envelope prototype. He provided essential inputs on the reversible concept, visual appearance, database integration, and branding the new product.

By the end of Cycle 1, David Rickard had successfully developed and reviewed the prototype, demonstrating its potential to reduce waste and incorporate smart features for improved customer engagement.

Mission (Mission-Driven Project):

The mission-driven aspect of Cycle 1 aimed to create a collaborative artwork that connects people across Europe, using the flow of information and value as a central theme.

KEY EFFORTS

Setting a Collaborative Artwork	Rickard initiated a collaborative project to connect people from diverse locations in Europe through a shared experience and exchange of information.
SMARTENVELOPE Product Validation	To validate the smart envelope, Rickard organised the collection of water samples in glass vessels, which were then sent using the smart envelopes (reversible). This process not only tested the envelope's functionality but also engaged participants in a collective activity.
Final Outcome - Installation	The culmination of this mission was the aggregation of all received water samples into an installation, showcasing the collective effort and interconnectedness fostered by the project.

CONCLUSION

In Cycle 1, David Rickard successfully advanced the project through both challenge-driven and mission-driven initiatives. By developing a reusable physical envelope with integrated smart features, Rickard addressed the need for sustainable and interactive customer solutions. Simultaneously, he fostered a sense of connection and collaboration across Europe through the SMART ENVELOPE project, which involved collecting and showcasing water samples. These efforts laid a solid foundation for the project's subsequent phases, highlighting the potential for innovation, sustainability, and community engagement in product design and artistic endeavours.

Iteration • Cycle 2: Experiment

In the second cycle of the project, **the focus shifts towards the Collaboration members**, a phase designed to be more manageable and less intense than Cycle 1. Cycle 2 emphasises moving beyond theoretical discussions to **actual implementation and experimentation**, validating the feasibility and effectiveness of ideas before focusing on demonstrations in Cycle 3 during the **prototyping phase**. The efforts of mentors in guiding and refining the challenges, combined with the practical testing by Collaboration members, lay a solid foundation for the subsequent phases of the project.

Team STARIOT
Eleni Karagiannidou packages wheat stem straws at SME Staramaki

Objectives:

1

TRANSITION FROM DISCUSSING CONCEPTS TO PRACTICALLY TESTING

Implementation and experimentation:

I The shift from theoretical discussions to practical testing marks a critical transition in the project. This phase involves taking the ideas and concepts that were thoroughly discussed and planned in Cycle 1 and putting them into experiments. The goal is to move from a conceptual understanding to practical application, where these ideas can be tested and validated **in real-world scenarios**.

II To facilitate this transition, specific tasks and experiments are designed to test the feasibility, functionality, and effectiveness of the concepts. This might involve creating **early prototypes, conducting pilot tests, or setting up controlled experiments** to gather data and/or insights.

III The practical testing phase allows the project team to **identify any gaps or issues** in the initial concepts and make necessary adjustments (iterations). It provides a hands-on experience that can reveal unforeseen challenges and opportunities, leading to a more refined solution or product.

IV **Regular feedback sessions and iterative testing** are crucial during this phase. By continuously assessing the results and incorporating feedback, the project can evolve and improve, ensuring that the final outcomes are well-grounded in practical realities of the industry or market.

2

ENSURE THE PROJECT MAINTAINS DIRECTION AND COHERENCE

Clear focus and consistent progress:

I Maintaining direction and coherence throughout the project is essential for achieving the desired outcomes. This involves having a **clear and well-defined focus.**

II To ensure consistent progress, the project must have a **detailed plan** that outlines the specific tasks, timelines, and milestones. This plan acts as a

roadmap, helping the team stay on track and avoid deviations.

III **Regular check-ins and progress reviews** (deliverables) are vital for maintaining coherence. These sessions allow the team to assess the current status, address any challenges, and make necessary adjustments. By keeping everyone aligned and informed, the project can maintain momentum and avoid potential pitfalls.

IV **Effective communication** plays a key role in ensuring direction and coherence. All Collaboration members must be on the same page regarding the project's goals, progress, and any changes that may arise. This can be achieved through regular meetings, updates, and transparent sharing of information.

V Lastly, having a **robust monitoring and evaluation system** helps in tracking progress and measuring success. By regularly reviewing Key Performance Indicators (KPIs), the project can ensure that it stays aligned with its overall goals and objectives.

By focusing on practical testing and maintaining clear direction and coherence, Cycle 2 aims to build on the foundation laid in Cycle 1, **transforming theoretical concepts into validated solutions** while keeping the project aligned with its overarching goals.

Roles of the various team members

COLLABORATION MEMBERS (SME, ARTIST)

A) Act as experimenters:
Collaboration members take an active role in testing and implementing the ideas from Cycle 1.

B) Put into practice and test the ideas developed in Cycle 1:
Through hands-on experimentation, Collaboration members validate the feasibility and effectiveness of the concepts.

C) Move from theoretical discussions to practical demonstrations:
Collaboration members focus on demonstrating the practical applications of the ideas, turning discussions into tangible results.

MENTORS

A) Follow the work done by the Collaboration members:
Mentors closely monitor the progress of Collaboration members, providing support and feedback as needed.

B) Fine-tune and adjust the concepts developed in Cycle 1:
Based on practical experimentation, mentors help refine and improve the initial concepts.

C) Provide guidance to keep the project on track:
Mentors ensure that the project stays aligned with its objectives, offering advice and direction to overcome challenges.

The Collaboration (SME and Artist):

The Collaboration is a structured initiative aimed at fostering innovation and practical implementation within a project environment.

In its second cycle, the Collaboration focuses on two critical components: Scenario Analysis and Encouraging Experimentation. This phase is designed to move beyond theoretical discussions to practical testing and experimentation, ensuring that ideas developed in Cycle 1 are rigorously evaluated and validated.

The following sections will describe the importance of conducting a thorough scenario analysis, streamlining focus by eliminating less viable options, making informed decisions, mitigating risks, and ensuring strategic alignment. Additionally, it will cover the encouragement of practical testing, transitioning discussions into actionable outcomes, and enforcing practical applications to validate theoretical concepts. These steps lay the foundation for successful demonstrations and prototyping in the subsequent cycle.

SCENARIO ANALYSIS

A) Thorough Analysis:
Conducting in-depth analysis of different scenarios allows the team to assess their feasibility, potential impact, and alignment with project goals.

B) Streamlining Focus:
Identifying and eliminating less viable options helps streamline efforts and resources towards the most promising directions, ensuring efficient project execution.

C) Informed Decision-Making:
Provides a structured approach to evaluate different scenarios, leading to more informed and strategic decisions and reduces the risk of unforeseen issues by thoroughly considering various possibilities.

D) Risk Mitigation:

Identifies potential risks and challenges associa- ted with each scenario, enabling proactive management and mitigation strategies. This enhances the team's ability to anticipate and prepare for different eventualities.

E) Strategic Alignment:

Ensures chosen scenarios align with the project's goals and the organisation's strategic vision and facilitates goal-oriented planning and execution.

EXPERIMENTATION

A) Encourage Practical Testing:

Motivate and sometimes enforce the Collaboration's members to shift from theoretical discussions to experimenting with chosen scenarios, ensuring ideas are tested in practical settings.

B) Actionable Outcomes:

Transition discussions into actionable and demonstrable outcomes, promoting the implementation and testing of ideas.

C) Practical Applications:

Enforce transitions with specific requirements or deadlines for experimentation to validate theoretical concepts in real-world scenarios, leading to tangible results.

The primary objective of **Cycle 2** is to transition from discussing concepts to practically testing and experimenting with the ideas developed in **Cycle 1**. This phase emphasises moving beyond theoretical discussions to actual implementation and experimentation, validating the feasibility and effectiveness of ideas before focusing on demonstrations in **Cycle 3** during the prototyping phase. The efforts of mentors in guiding and refining the project, combined with the practical testing by the Collaboration's members, lays a solid foundation for the subsequent phases of the project.

Iteration • Cycle 3: Demonstration

In the third cycle of the project, the focus shifts yet again, this time to **work towards a concrete and complete result**, even if it remains at the level of a prototype. Cycle 3 emphasises preparing a demonstrator, a working model of the invention or innovation, in the intended environment of operation. In this stage, the intensity of collaboration is high, as stress rises and time is running out. Moreover, finishing is a challenge, requiring fast decision making and constantly balancing priorities and possibilities.

The purpose of this cycle is to be able to **place outputs** of the project in any of **three categories**:

1 New ends

Surprising or 'new end' outcomes are experimentation **outcomes that demonstrate new insight, knowledge, or unexpected uses** for technology or material in the addressed domain(s) and theme(s). They reach conclusive outcomes on which further nurturing of the idea can be based. They could lead to a new start, and hence, a future new end. Therefore, outcomes in the surprising category are the outcomes that **we seek to realise art-driven innovation**.

2

Dead ends

Dead end outcomes come in many forms. It can be the case that the outcome is **unrealistic to further pursue** because of, amongst other possible reasons: high required investments, underdeveloped technology (speculative), legal barriers, new knowledge or unintended possible negative consequences when deployed. Outcomes that lead to a dead end are **valuable for learning** and should make us think how we could use this knowledge going forward, but it won't lead to art-driven innovation proposals.

3

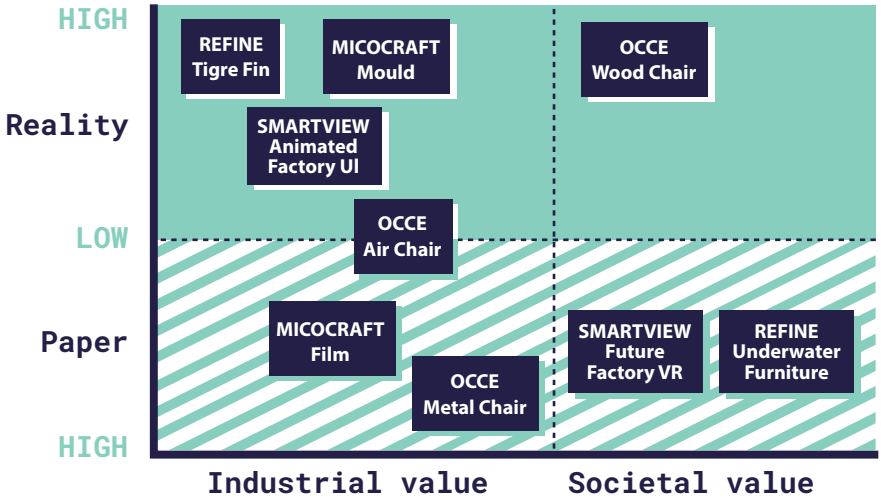
Open ends

Inconclusive, or open-ended outcomes are the type of experiments which are, in essence, **not finalised**. There is no outcome yet, therefore, nothing reasonable can be said about the quality and potential of it. In the art-driven innovation methodology, we call these **outcomes failures**. They were either based on the wrong igniting questions at the very start or they were unrealistic to pursue within the given timeframe, budget, and/or available competencies set for the project. They should **feed a learning feedback loop** within the project team, asking the questions: Can we figure out what was wrong with the question or the setup? Can we fix this and redo the experiment in another way? Hence, the level of uncertainty stays high.

What an **outcome demonstrator** consists of, or is exactly, can be many things, ranging from speculative early-stage demonstrators of future scenarios to minimum viable products close to market readiness. And much in between: service prototypes, technology prototypes, process interventions, artworks, or research outputs.

We created a model in which the outcomes of Artist and SME collaborative projects can be placed in one of **four segments**, pending the maturity of the demonstrator on paper or in reality and the value category: **industrial or societal**. The image, plotting several of the Collaboration outcomes achieved in Better Factory, demonstrates that projects can deliver multiple outcomes belonging to multiple categories in the model.

Figure 6 – Artist and SME collaborative outcomes: Maturity level vs. Value



REALITY

Industrial value outcomes: Demonstrated outcomes which have been physically (or digitally) prototyped to demonstrate their working in reality for industrial purposes.

Societal value outcomes: Demonstrated outcomes which have been physically (or digitally) prototyped to demonstrate their working in reality for societal purposes.

PAPER

Industrial value outcomes: Demonstrated outcomes which have been conceptually created and communicated 'on paper' (meaning in writing, drawing, images, film, scale models, etc) to envision future potential industrial value.

Societal value outcomes: Demonstrated outcomes which have been conceptually created and communicated 'on paper' to envision future potential societal value.

Chapter 5

Innovate

"He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening mine"

- Thomas Jefferson, the Life and Selected Writings.

The ultimate goal for art-industry collaborative projects is vested in the promise of innovation, of value creation. In this process, inventions are created by any combination of involved partners or associated parties. However, the understanding of **what value is and how this could be exploited often differs between the collaborators,** as a result of their personal or organisational intentions. Where an industrial organisation can be expected to seek economic value, the artist may or may not seek the same. On the other hand, where the artist can be expected to seek cultural, societal or artistic value, this may or may not be of interest to the industrial collaborator.

To **manage expectations, ensure fairness** and **sustain productive collaborative relationships**, we have identified four crucial moments throughout the Collaboration where the topics of invention and value should be considered.

The four moments of invention and value creation

At the official start of the Collaboration:
WHO WANTS WHAT?

Identify the intentions of all collaborators. Why are they invested in this project? Who wants what to happen? Write this down and save it. In the case the intentions change over time, or the people involved are replaced, it is important to be able to go back to this document to re-confirm or re-assess.

When the key performance indicators are identified:
WHO PROMISES WHAT?

In our methodology, the first stage of the collaborative project focuses on identifying the measurable, specific and actionable ambitions the project sets out to pursue. These ambitions, or key performance indicators (KPIs), are connected to one or more of the project collaborators. They can be seen as individual promises towards the team (see Annex 1).

When the experiments are conducted:
WHO IS DOING WHAT?

Regularly (with monthly or bi-monthly intervals) identify who is doing what work during the phases of experimentation and prototyping. It is here where copyright protected inventions are mostly developed. The most common categories of copyright protected Intellectual Property which should be documented are:

I Data produced during experiments conducted

II Code written during experiments conducted

III Designs created during experiments conducted

IV [Technical] drawings made during experiments conducted

V Original texts written during experiments conducted

4

When the results are demonstrated:
WHO DID WHAT and WHO WANTS WHAT NOW?

When the result is there and the prototype is demonstrated, the topic of innovation comes to the table. Depending on how advanced the result is in terms of technological readiness (Technology Readiness Level assessment), the collaborators scout and seek opportunities to exploit, possibly commercialise, disseminate or share the outcomes with the world.

This is the moment to **complete and agree on the 'list of inventions'** prepared in moment 3 and re-assess what each collaborator wants now. Based on this assessment, a deal should be made between the collaborators concerning further development and exploitation of the result.

The Innovation Deal

When arriving at the crossroad of possible futures for the results achieved during the Collaboration an innovation deal needs to be agreed upon. We call it a 'deal' because it concerns **an agreement between the collaborators** on what can and cannot happen next. Every situation is different and requires individual assessment.

Team Shoes in Circle - SME Tapi-1, a shoe producer in Poland, and their factory at work

What we present here are **three main optional components** of the deal.

TRANSFERRING RIGHTS TO USE

When one collaborator intends to exploit or further develop a result which was created by one or more of the other collaborators, one strategy is to transfer the rights to use. Much like a sale, the ownership of the copyright on a design, a code, a dataset, etc. usually happens on the condition of a (financial) return. This transfer can be agreed upon at any of the four moments of invention and value creation considering, so also before or during the period of invention.

SHARING

Results can be shared automatically or deliberately:

- In case a result was the outcome of a highly collaborative process, where multiple collaborators actively contributed to the invention protected by copyright, the rights on the result are shared by default. This allows collaborators to use the results in the way they deem right, unless agreements have been made as to what to do with the results between the collaborators. For example, whether or not to share the results open source.

- It is also possible that a collaborator agrees to share with or without conditions their creation(s) in the project with other collaborators, thereby allowing collaborators to make use of the results without the need to purchase or license the rights.

LICENSING

When the collaborators intend to stay involved with each other and the distribution of copyrights on the inventions that have been produced during the project, a deal based on licensing can be the best option. When agreeing upon a license deal, the collaborators agree upon a form of repeated or structural flow of resources between the parties based on conditions agreed upon in the deal. This can be a standardised license model based on repetitive licensing fees, or a performance-based model where the presence and amount of licensing fees is connected to the performance achieved with the result of the project.

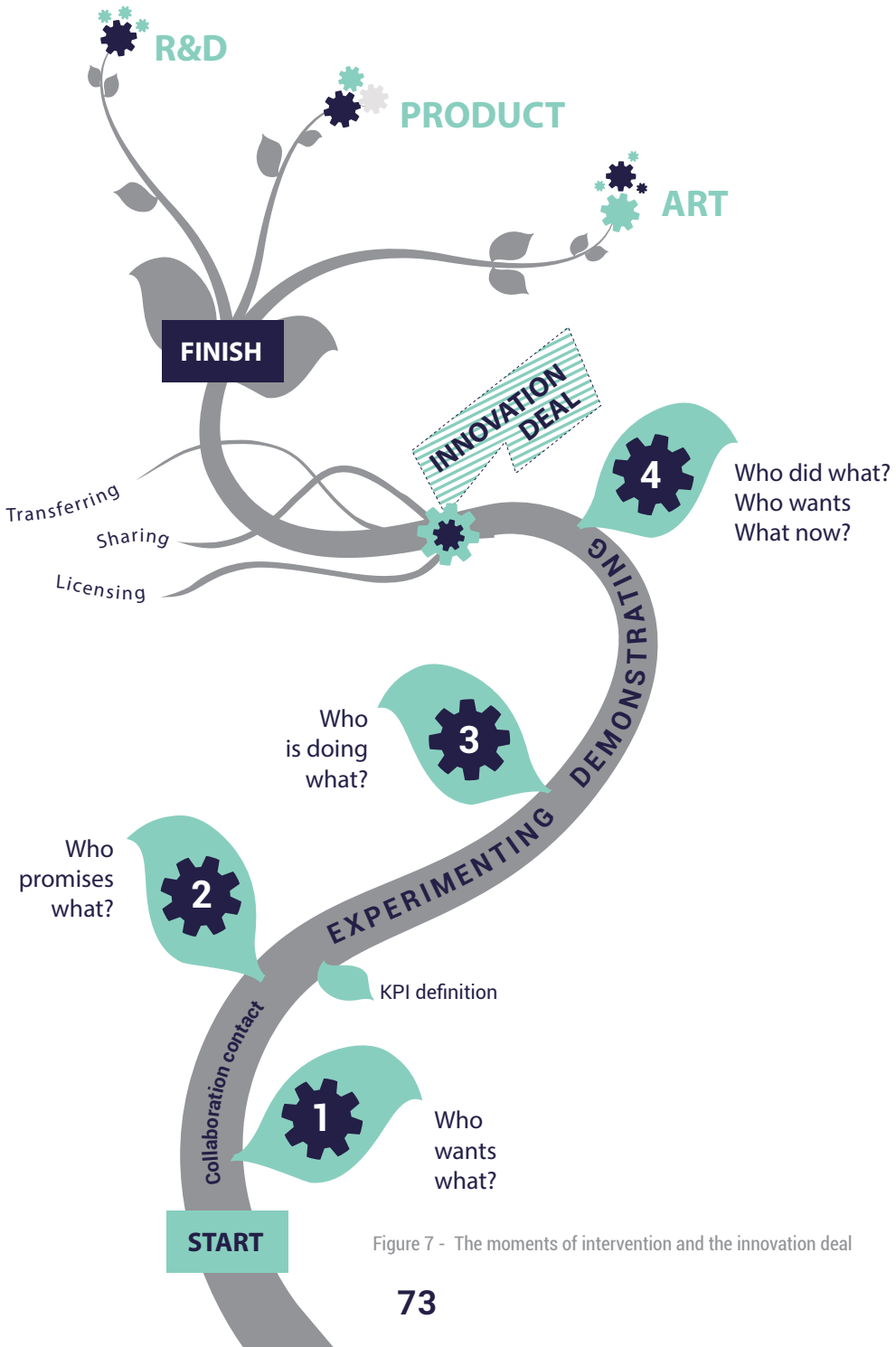


Figure 7 - The moments of intervention and the innovation deal

Chapter 6

Share the Story

Better Factory resulted in many technological, business and social innovations. However, equally important are the stories embedded in these journeys. It was our ambition to **make these stories visible,** recognisable and accessible through various mediums. Most notably, some of these stories unfold through art works in the form of objects, installations and various forms of creative digital expressions.

Often connected with the mission-driven projects, these creative expressions evidence **the S+T+ARTS dimension of these projects.** They raise fundamental questions, project speculatively into the 'concept car' of the future, lead to new challenges, visions, inspire further experiments and fit into an artistic portfolio creating a whole new line of artistic expression.

A closer look at resulting art works…

Nicola Ellis (team MiniRoboFab)

UK-based artist **Nicola Ellis** participated in the 'MiniRoboFab' team having already a long-standing partnership with Ritherdon and Co. The company specialised in the fabrication of products from sheet metal, a process which produced excessive metal dust as waste. Nicola expanded her artistic research and created an exhibition series of steel powder coated paintings.

No gaps in the line exhibition - © Nicola Ellis and Ritherdon & Co Ltd

Artist Nicola Ellis' work - SME Ritherdon's steel enclosures with experimental powder coating finishes

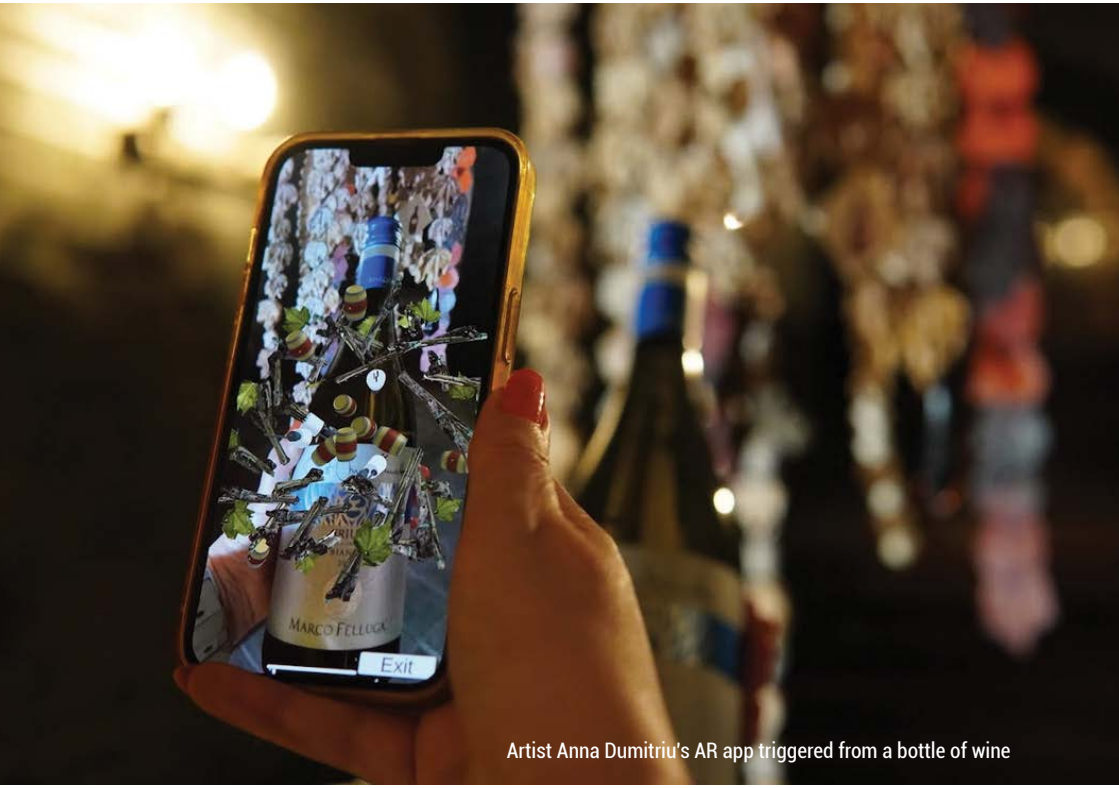
The panels, ordered chronologically from left to right, are coated with the colours used daily in the paint shop. Custom-sized to fit the gallery walls, these panels were placed on the Ritherdon paint shop's conveyor after each colour run almost reversing the steel formation. Some panels display a single colour, while others feature multiple powders. This series emphasises the subtle differences in powder coating finishes, with tones exposing powder interactions. In the factory, this process would be intentionally avoided since colours are typically cleaned out to prevent contamination. These works function both as paintings and records of the paint shop's daily tasks.

Anna Dumitriu (team IOWA)

Artist Anna Dumitriu's Wine Waste Biomaterials Chandelier

Anna Dumitriu, British artist, collaborated within team 'IOWA' (Internet of Wine and Art), with the Marco Felluga, an Italian wine producer. Her topic involved repurposing wine waste. Anna experimented with designing alternative bio-based material which can also be used for packaging, however her main concern was to engage high end consumers with the idea of circularity by juxtaposing luxury consumption (wine) and sustainability narratives.

This exploration resulted in an art installation with casted wine waste objects assembled into a chandelier. The work was further complemented by an AR application which was developed from the artwork, providing custom and individual-based visuals each time a user engaged with it.



Artist Anna Dumitriu's AR app triggered from a bottle of wine

Isaac Monté (team FOLD)

Isaac Monté, a Dutch artist, collaborated with Europack, a Bulgarian packaging company, to explore new applications for Stone Paper. Their project aimed to help Europack diversify beyond packaging by

Three editions of artist Isaac Monte's stone printed shells

developing innovative products. Monté's research evolved into a sophisticated printing installation showcased at Dutch Design Week 2023.

Issac experimented with Stone Paper, focusing on recycling manufacturing waste to create new products and promoting circularity. He also redesigned wine grow tubes using Stone Paper, highlighting its eco-friendly potential.

Overall, Isaac expanded bio-based material applications in additive manufacturing, developing extrusion techniques for Stone Paper. His work included crafting biobased pastes from waste streams and

Artist Isaac Monte's work after Better Factory includes 'spirograph' items like the blue bulb vase

creating monumental clams that blend traditional stonemasonry with modern technology, emphasising sustainable design. This collaboration resulted in a unique product line showcasing the creative potential of rethinking industrial by-products.

Artist David Rickard's envelope design is environmentally intelligent and can be turned inside out

David Rickard (team Smart Envelope)

David Rickard, a New Zealand-born contemporary artist currently based in London, collaborated with PlastFARB, a Polish envelope manufacturer. Together, they merged artistic vision with industrial expertise, leveraging each other's strengths to push the boundaries of envelope design and functionality. In this integrated approach, the mission-driven initiative aimed to foster connections among people across Europe through a collaborative artwork, emphasising the flow of information and value across borders.

To achieve this mission, David leveraged a challenge-driven project, developing a groundbreaking physical envelope designed for reuse and integrated with smart features. This envelope served as both a tool for connecting individuals via a collaborative artwork and a platform for testing real-world conditions. Through the collection of water samples in vessels sent inside the smart envelope, the product's validation occurred in practical settings, enhancing its functionality and relevance.

David played a central role in both projects, shaping the envelope's design and functionality while also facilitating the aggregation of samples received for a captivating installation. By blending mission and challenge-driven approaches, David not only tested innovative solutions but also demonstrated the power of art in addressing real-world challenges.

Gareth Neal (team OCD3D)

Gareth Neal, a British artist, participated in the 'OCD3D' team where he designed a weaving algorithm that mimicked the movement of willow and grass weaving techniques used in basketry such as, knit and crochet. The technique was used in 3D printing with third time recycled plastics (an unconventional and difficult material) to produce crafts, bespoke functional objects such as chairs and plant pots/vessels. Gareth's artistic ambition was to revive basketry with modern tools which were designed to accept the irregularities caused from the printing movements mimicking crochet or willow weaving.

Artist Gareth Neal and SME The New Raw used thrice-recycled plastic and a new 3D-printing method - Photo by James Champion

The result is printing in loops, rather than layers, seen here in the Loopy Chair - Photo by James Champion

This method created subtle differences throughout the prints, linking this strong narrative of craftsman and the robot. It allowed a space to be created where imperfection could exist and be accepted. The resulting objects were unique robotic hand-crafted prints, which is a rare combination if not the only.

This blend and crafts informed algorithmic language and gave birth to a new manufacturing logic where quality measure was not set to perfection but embraced imperfection with a larger bracket of acceptability. In this way, Gareth crossed the gap between automation and traditional crafts. The objects were later exhibited at the GLUE Festival in Amsterdam in 2023.

A few customized products used by SMEs…

Javier Masa (team REFINE)

Through a collaborative effort with SEAC, an Italian diving material company, **Javier Masa**, an Italian industrial designer and artist, has pioneered a groundbreaking approach to sustainable design in the scuba diving industry. Embracing an open-minded ethos, Javier challenged conventional norms, leading to the development of innovative solutions across functional, aesthetic, and emotional dimensions. His creative process, marked by deep analysis and unconventional exploration, birthed four distinct projects within the REFINE (Fins reshoring for a fine engineered factory) team:

Exhibition of works by Javier Masa (NMASA Design)

Recycled plastic fin by Javier Masa (NMASA Design)

1. Addressing Packaging Waste:

Masa reimagined packaging as valuable objects, developing a prototype packaging strap made from HDPE, showcasing potential for sustainable packaging that enhances diver experience.

2. Transforming Ocean Waste:

Collaborating with manufacturers, Masa integrated marine debris into fin production, aiming to replace conventional materials with recycled plastic, paving the way for aquatic freedom.

3. Enhancing Environmental Awareness:

Masa redesigned fins to increase diver sensitivity and environmental awareness, resulting in visually striking and conceptually disruptive designs that encourage careful movement.

4. Creating Marine Life-Friendly Furniture:

Masa reimagined underwater rest spaces, designing modular, ergonomic furniture that doubles as artificial reefs, blending diver comfort with ecosystem preservation.

These projects not only promote environmentally friendly practices and materials but also inspire broader industry adoption of sustainable solutions, ultimately enhancing diver experiences while safeguarding marine ecosystems. Moving through speculative, experimental, and prototype stages, the collaboration with SEAC has unlocked significant potential for further development and integration into broader initiatives for sustainable underwater activities. An exhibition titled "Artifacts for a Scuba Diving Utopia" showcased these projects at the Southern Sweden Design Days in May 2024, highlighting their impact and promoting sustainable design in scuba diving on a global scale.

Anka Walicka (team Shoes in Circle)

Anka Walicka's final circular knitted shoe designs

Anka Walicka is a Polish artist and shoe designer WHO has a strong fascination for material research and uses the influence of nature-inspired mathematical laws. DURING her involvement in Better Factory she created two main works that aim to bridge traditional craftsmanship with modern technologies. In collaboration with Tapi she produced a set of designs for circular knitted shoes, making use of the latest knitting technologies to create new products that were fully customisable and would lower the use of material, equalling less waste.

Additionally, she developed a methodology to adapt the foot's shape to the last sole, creating an ergonomic sole design perfectly matched to different foot types. Collaborating with an architect and using Grasshopper software for parametric design, she was inspired by papillary lines and the Gabor filter to create a unique pattern on the sole's surface. The final model of the sole was 3D printed.

Jesse Howard (team BCF/Found Objects)

Jesse Howard is a Dutch artist. His artistic and design research focuses on how the tools and practices of open-source software development could serve as models for new networks and systems of production. While doing so, Jesse encourages us to reimagine everyday objects, hacking their functionality, form and content in response into new forms of digital fabrication and distributed development. Jesse's collaboration with Fiction Factory led to the creation of optimisation algorithms that invite us to reimagine new uses of CNS wood slate wastes.

The resulting works are regenerated objects, an open-source tool, a nesting game and design challenges which are extended to further collaborations with fellow designers and artists to rebuild with waste.

Artist Jesse Howard and SME Fiction Factory used software to dynamically create objects from left-over sheet material in CNC production, making shelving units, stools and wall cladding. Photos by Iñigo Puerta Uranga

Conclusions and takeaways

This playbook represents the culmination of a 32-month journey through the largest scale art, industry and tech experiment in Horizon 2020. This comprehensive guide is designed to transfer the accumulated knowledge and insights of the mentoring team to a broader community, aiming to facilitate similar collaborative projects at the intersection of art, industry, science, technology, and society.

Key Takeaways:

1. **ART-INDUSTRY COLLABORATION:**

Art-driven innovation is a powerful methodology that enhances creativity, problem-solving, and sustainability within industrial contexts. Artists bring unique perspectives that complement the technical and operational strengths of industry professionals, leading to cross-disciplinary innovation, enhanced creativity, cultural and social impact, sustainable practices, and disruptive products.

2. **STRUCTURED APPROACH:**

This toolkit provides a structured approach to tackle complex industrial-manufacturing challenges creatively and innovatively. It emphasises the importance of framing a clear challenge, finding the right match between artists and SMEs, forming balanced and complementary teams, and implementing iterative cycles of experimentation and learning.

3. ITERATIVE PROCESS:

The core methodology involves three cycles of ideation, iteration, and demonstration. Each cycle builds on the previous one, promoting continuous improvement and adaptation based on real-time feedback and insights. This iterative process ensures that projects evolve dynamically, driving innovation and achieving better results.

4. MENTORSHIP:

Mentorship plays a crucial role in supporting and guiding collaborations. Mentors act as facilitators, advisors, co-creators, mediators, promoters, and translators, helping teams navigate challenges, maintain alignment, and achieve their goals. A flexible and adaptive mentoring approach is essential to address the diverse needs of collaborative projects.

5. PRACTICAL INSIGHTS:

The toolkit offers practical insights and lessons learned from the Better Factory project, including effective matchmaking strategies, team formation processes, iterative experimentation cycles, and innovation management. These insights are supported by real-world examples and case studies, showcasing successful collaborations and their outcomes.

6. INNOVATION AND VALUE CREATION:

The ultimate goal of these collaborative projects is to foster innovation and create value. The toolkit emphasises the importance of managing expectations, ensuring fairness, and sustaining productive relationships throughout the collaboration. It provides guidance on identifying intentions, defining key performance indicators, documenting intellectual property, and making informed decisions about the exploitation and dissemination of results.

7. STORYTELLING AND KNOWLEDGE SHARING:

Sharing the narrative of collaborative projects is vital for building a collective knowledge base and inspiring further innovation. The toolkit encourages participants to document and share their experiences, showcasing creative outputs and demonstrating the multiplier effect of these experiments.

Final Thoughts

This playbook is a valuable resource for anyone interested in starting cross-disciplinary collaborations involving art, industry, and technology. By engaging with this toolkit, participants can embark on **a journey of collaborative innovation**, leveraging diverse perspectives and skills to create impactful solutions. The experiences and lessons shared in this toolkit highlight the meaningful and transformative potential of art-driven innovation in industrial contexts.

As we conclude this journey, **we remain convinced that art in industry is a meaningful endeavour that should be supported, nurtured, and advanced further**. The Better Factory project has demonstrated that creative collaborations, despite their unconventional nature, can lead to significant and inspiring results. We hope this toolkit serves as a practical guide and a source of inspiration for future projects, fostering a culture of continuous learning, collaboration, and innovation.

Experiments Catalogue

MANUFACTURING COMPANIES | ARTISTS | TECHNOLOGY PROVIDER

1 SMARTHAM

Supervised Manufacturing of Real-time Traceability in Ham Production

Innovating a centuries old and highly restrictive production and sales process of Parma ham by introducing digital and data-driven technologies for improved traceability and customized products.

Capanna Prosciutti	**Studio De Wilde**	**Sirmium ERP**
ITALY	BELGIUM	SERBIA

2 DSBSF

Digital Solutions for Better Scales Factory

Across the globe remote design of customized advanced weighing scales and customer support through augmented reality visualization.

Delmac Scales	**Sara Made**	**Bridgewater Labs**
GREECE	NETHERLANDS	SERBIA

3 FOLD

Modular Cobot for Production of Stone Paper Innovative Products

Pushing the boundaries of new and circular material Stone Paper for packaging and an envelope of new applications. In this experiment, grow tubes will be created for the protection of young trees.

Europack	**Isaac Monte**	**Oviso Robotics**
BULGARIA	NETHERLANDS	ROMANIA

4 BCF

Better CNC Factory

Developing a state-of-the-art CNC wood production of highly customised furniture and architecture using a programming system for automized process reconfiguration. New designs will be adapted to the wasted material available.

Fiction Factory	**Jesse Howard**	**IAAC**
NETHERLANDS	NETHERLANDS	SPAIN

	MANUFACTURING COMPANIES	ARTISTS	TECHNOLOGY PROVIDER

5 MiniRoboFab

Exploring product customisation and robotic fabrication in a small factory

Testing human-robot coworking in a small, realizing a zero waste, micro robotic factory for individualised metal products production.

Ritherdon	Nicola Ellis	Digiotouch OU
UK	UK	ESTONIA

6 WRC

Welded metal door design and fabrication, and innovation and automatization of production

Integrated digitalization for improving the working environment of traditionally manual welded metal doors. New mechanical and aesthetical designs and functions will be explored.

Zovos-Eko	Tomas Libertiny	Rossum Integration
SLOVAKIA	NETHERLANDS	NETHERLANDS

7 ODC 3D

Optimization of digital craftmanship in 3D printing

Preparing large-scale 3D printing for the age of digital craftmanship. The manufacturing of custom recycled plastic products will be optimized using AI for energy and material-saving.

The New Raw	Gareth Neal	Artific Intelligence
NETHERLANDS	UK	FINLAND

8 OCCE

The 100% recyclable office chair

Reimagining the traditional office chair with a focus on 100% recyclability, reduced emissions, and minimised production costs.

Antares Romania	Enrichers	Comfrac Green Energy
ROMANIA	NETHERLANDS	ROMANIA

9 IoWA

Sustainable wine production with AR and robotics

Optimising Wine Production with Smart Corks, Eco-Packaging, Biomaterials, E-Labelling, and Augmented Reality.

Marco Felluga	Anna Dumitriu	Bubamara V
ITALY	UK	SERBIA

10 STARIoT

Sustainable straws, greener future

Revolutionizing the straw market with durable, resistant and socially responsible products.

Staramaki	Gilbert Sinnott	CommonsLab
GREECE	GERMANY	GREECE

	MANUFACTURING COMPANIES	ARTISTS	TECHNOLOGY PROVIDER
11 Shoes in Circle **Reducing footprint with sustainable shoes** Sustainable knitted shoes, combined with IoT and robotics to reduce waste.	**Tapi-1 Aleksander Żur** POLAND	**Anka Walicka Projekt** POLAND	**Studio GF&L Unipessoal, Lda** PORTUGAL
12 MICOCRAFT **Bio-inspired glue for sustainably manufactured products** A biobased material, using a natural glue, replaces synthetic materials, for a sustainable manufacturing process for the construction industry.	**Rongo Design** ROMANIA	**ONSITE STUDIO** FRANCE	**SPE Global Solutions** POLAND
13 SMARTVIEW **Factory collaboration at your fingertips** Enhancing cross-factory collaboration and communication for improved productivity, sustainability, and worker well-being.	**Famolde** PORTUGAL	**Kristina Pulejtova** UK	**Octavic** ROMANIA
14 SmartEnvelope **Digitalized and eco-friendly envelopes** A new line of sustainable and digital postal products, designed to enhance customer experience and environmental responsibility.	**Plast-farb** POLAND	**David Rickard** UK	**And-Tech** POLAND
15 DARTDESIGN **Artistic innovation by titanium 3D printing** Identifying new applications and markets for products made from overused powder from medical implants.	**PREMET** HUNGARY	**Lasram Engineering Kft** HUNGARY	**Studio Nick Ervinck** BELGIUM
16 reFINE **Dive deeper with less impact** The future of sustainable F1 scuba diving fins, with an optimised design and reshored manufacturing processes.	**SEACSUB** ITALY	**NMASA Design** SWEDEN	**Canonical Robots** SPAIN

ANNEX 1: Mentoring Template

Tables of KPIs*

TECHNICAL KPIS					
Nº	**KPI**	**Obj.**	**Explanation**	**Means of verification**	**Target month (MX)**
			fill in the table		

BUSINESS (INCL. ARTISTIC) KPIS					
Nº	**KPI**	**Obj.**	**Explanation**	**Means of verification**	**Target month (MX)**
			fill in the table		

**KPIs come directly from the proposal. In addition, specification of KPIs or additional KPIs can be added in these tables. KPIs are not formal deliverables or milestones but benchmarks against which to measure success achieved and impact realised as a result of the project.*

Support Services provided by the project

Collaboration project development is about three entities from different worlds coming together to share ideas, knowledge and skills in the pursuit of art-driven technological innovation. The process shall be divided into 3 iteration cycles, each leading to the submission of two deliverables.

ITERATION CYCLE 1: Project Requirements

Start: M2		**End:** M5
PHASE 1	Ideate M2	Development of ideas based on situation analysis
PHASE 2	Prepare M3	Prepare the conditions: tools needed / inputs required
PHASE 3	Learn M5	Continuous learning, feedback and knowledge sharing
Deliverables: D2.1 & D3.1		**Due date**: M5

ITERATION CYCLE 2: Proof of Concept prepared

Start: M6		**End:** M9
PHASE 1	Ideate M6	Adaptation / Selection of ideas based on Cycle 1
PHASE 2	Prepare M7	Prepare the conditions for PoC / Prototype testing
PHASE 3	Build M8	Building the solution in phases: Proof of Concept / Demo
PHASE 4	Learn M9	Continuous learning, feedback and knowledge sharing
Deliverables: D2.2 & D3.2		**Due date**: M9

ITERATION CYCLE 3: Demonstrator realized

Start: M10		**End:** M13
PHASE 1	Ideate M10	Adaptation / Selection of ideas based on Cycle 2
PHASE 2	Prepare M11	Prepare the conditions for implementation / deployment
PHASE 3	Build M12	Building the solution in phases: Setup / Run / Produced
PHASE 4	Learn M13	Continuous learning, feedback and knowledge sharing
Deliverables: D2.3 & D2.4 & D3.3		**Due date**: M13

Type of support that the Better Factory consortium gave to the teams as part of the programme services.

Code	ARTISTIC SUPPORT
AS.1	Network and knowledge support throughout the process
AS.2	Impact analysis of the work conducted
AS.3	Support Artist on product use cases development and analyzing feedback from SME and Tech supplier
AS.4	Pitch training sessions for dissemination activities

Code	BUSINESS SUPPORT
BS.1	Validation of the market need and trends
BS.2	Competitive analysis
BS.3	Structure the value chain to get access to relevant distribution partners (System Integrators)
BS.4	Definition of a business plan to seek additional investment for commercial implementation of the solution in manufacturing SMEs
BS.5	Definition of a business case to support Tech suppliers' commercialization plan on RAMP marketplace
BS.6	Consulting support on getting Public financing (online service in Marketplace), Loans in partnership with local players (through DIHs regional ecosystems) and private investment or co-development with industrial partners
BS.7	Pitch training sessions

Code	TECHNICAL SUPPORT
TS.1	Support in defining compatible software architectures as well as in developing NGSI data models, and testing features
TS.2	Support for connecting robots, sensors, and management systems to the FIWARE Orion Context Broker at the servers provided by VTT. Support will be provided for establishing connection either using existing FIWARE Enablers or through custom integration agents that implements the necessary bridges the native equipment interfaces and NGSI
TS.3	Full support on the existing tools and components for development
TS.4	Support in demonstrating the critical parts of the robotics solutions with real hardware and software
TS.5	Build data dashboards for SMEs on the RAMP marketplace

Better factory was powered by:

RAMP
Robotics and Automation MarketPlace

Connect. Collaborate. Automate

Empowering businesses. Transforming manufacturing.

RAMP (Robotics and Automation MarketPlace) is your one-stop destination for all things Manufacturing, connecting a diverse network of manufacturing SMEs, technology and service providers, and Digital Innovation Hubs across Europe. Your journey starts in the RAMP Marketplace to find the best partners and technologies, while utilizing the RAMP IIoT (Industrial Internet of Things) platform, you can harness the power of cloud and IIoT towards full digitization of your production.

Whether you are a Manufacturing SME, a Technology and Service Provider or a Digital Innovation Hub, empower your business with RAMP.

Marketplace

Bring production to the next level by connecting to your next technology partner

RAMP IIoT

Innovate with a full set of tools to bring your production to the Industrial Internet of Things (IIoT) era

Find a partner

There are several ways to find a partner in RAMP, according to your needs and level of expertise:

Find a partner to solve your production challenges in the catalogue of organisations in RAMP, based on profiling information, including country, expertise and services.

Discover solutions for digitisation, automation and robotics and connect with the most relevant technology provider.

Get local support by finding the Digital Innovation Hub in your region to connect with your local ecosystem.

Ask for a service by specifying your requirements, negotiate offers and track contracts with providers recommended by RAMP, specifically for your needs.

Access the RAMP IIoT

RAMP offers a complete set of cloud solutions that allow you to innovate and bring your production to the Industrial Internet of Things era.

1. **Start by connecting** your sensors, robots, machinery and software **to the RAMP cloud**. Our open-source solution adopts key technologies for interoperability, like MQTT and NGSI-LD.

2. **Store your data** on our secure data storage, ensuring that your valuable information is protected and readily available whenever you need it. Fully manage how your data is shared, when you need it.

3. **Find a partner in RAMP**, who will develop your bespoke solution for your production.

4. **You partner deploys your solution** by utilizing your private repository on RAMP, stored securely for future reference and improvements.

5. **Make available your cloud-based solution in your AppHub**, a common graphical environment for all your apps developed even by different service providers.

Technologies you can find in RAMP

RAMP provides access to **a broad range of technologies** aiming at improving performance in manufacturing through digitalization.

These have been developed by the companies, research organizations and universities found in the **RAMP technologies catalogue**. These are provided either as open-source (including source code and docker image formats) or as proprietary (to be licensed), while contact through RAMP for customization and integration is also available.

Before developing new applications for your challenges, have a look at RAMP for what has already been developed and tested in industrial settings. Utilizing existing technologies can **speed up** your implementation significantly.

In RAMP you can find technologies related to:

- Resource management
- Production planning and management, scheduling
- Operations planning, monitoring and management
- Quality control and management
- Human-robot interaction and work safety
- Logistics planning and management
- And more, in our continuously expanding catalogue!

I'm a Service provider or integrator…

What's in it for me?

RAMP is your valuable partner for **accessing a wide market and develop solutions** for your customers quicker.

- **Find customers** by publishing your services, expertise and available technologies.
- **Make offers** in public and invite-only opportunities.
- **Find available technologies and partners** that complement your expertise to offer a holistic solution to your customers.

- Utilise the **RAMP private docker registry** to quickly deploy and update your solutions for your customers.
- Enrich your offer by including **ready-to-use RAMP services and tools,** including the RAMP IIoT platform, cloud data storage, data visualization and AppHub.
- Keep all your service contracts, communication and **documentation with you customers** organized and always available in RAMP.

What about Digital Innovation Hubs, Clusters, RTOs and Universities?

On top of the above, RAMP provides opportunities for DIHs, RTOs and Universities to **expand and manage their network.**

- **Become the point of contact in your region** in a dedicated 'Local Support' page. Demonstrate to local actors in your region how digitalization is utilized in leading small and medium sized manufacturing companies in Europe.
- Use RAMP to **keep constant contact with your eco-system**, bring news about your activities, tools, technologies, best practices and funding opportunities. Enable local companies to benefit from the experiences of other SME companies.

- Post and **promote your next events**, set up local activities and projects in the area of digitalization of SME scale manufacturing, run open calls for matchmaking.

- Identify the forefront of digitalization in manufacturing and needs for further research and development. **Find commercial partners** for technology transfer and exploitation.

- **More info at RAMP.EU**

The consortium coordinated by VTT (Finland), includes 28 partners from 18 European countries representing the **Arts ecosystem** – Competence centres- (INOVA, GLUON and WAAG); **Technology competence centres** (Fraunhofer IPA, AIMEN, Scuola Universitaria Professionale della Svizzera Italiana, Slovakia National Centre of Robotic, INESCTEC, Cyprus University of Technology); **Industrial clusters** (Transylvanian Furniture Cluster, Slovenian Tool and Die Development Centre, Latvian Federation of Food Companies / Food Products Quality Cluster, CLUTEX - Klastr Technicke Textilie, Bydgoszcz Industrial Cluster Tool Valley, Chamber of Commerce and Industry of Pécs-Baranya, ICT Cluster and University of Oulu); **Technology suppliers** (INFOTECH, Top Data Science, Holonix, GESTALT Robotics and European Dynamics); **Art-driven innovation expert** (In4Art); **Business developer** (Hermia Yrityskehitys Oy); **Open Call management** (FundingBox); Legal framework (time.lex); and **Communication and Dissemination** (Mobile World Capital Barcelona).

Creativity Meets Industry

This book is built on the experiences and insights gained from the Better Factory project. Over four years, the project brought together 48 SMEs, artists, and technology providers across Europe to collaborate on 16 collaborative experiments.

It serves as a practical resource for SMEs and artists who wish to replicate the successful collaborations facilitated by Better Factory. It offers step-by-step guidance on how to form and manage these partnerships, focusing on solving industrial challenges in innovative ways.

It was written by the mentors in the Better Factory program, who had contact with all of these teams on a day-to-day basis.

S+T+ARTS
SCIENCE + TECHNOLOGY + ARTS

BETTER FACTORY

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starts.eu/betterfactory