



THE UNIVERSITY
of EDINBURGH

**The
Alan Turing
Institute**

Open Prototyping

The co-creation toolkit



Here you'll find:

A guide to Open Prototyping.
Tools for each stage.



What is Open Prototyping?

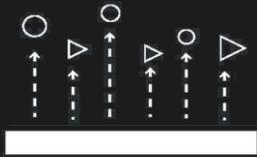
Open Prototyping is a design approach and process to imagine, navigate and shape co-creation projects.

It offers a way to bridge disciplinary viewpoints and connect to communities in the real world through experiential prototypes.

It enables teams to design, structure and evaluate collaborative R&D, and address urgent challenges through participatory experiments with data and technology.

You can use it to develop new products and services, reflect on their impact, and co-shape the future of technology and society.

Key principles of Open Prototyping:



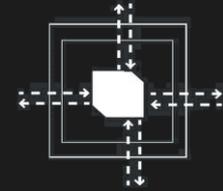
BUILD AGENCY

Collaborate with diverse communities to develop challenge themes and shape questions.



CREATE LEGIBILITY

Foster transparency and criticality in order to enhance understanding of function, provenance and context.



STIMULATE INNOVATION

Catalyse and implement new ideas that contribute towards a sustainable and safe future for all.

We use a visual process model to illustrate how it works.



The left side of the diamond indicates **opening up of the process** and exploration.



The right side of the diamond indicates **defining stage** of the process.



The circle is the **iterative, creative development** part of the process.

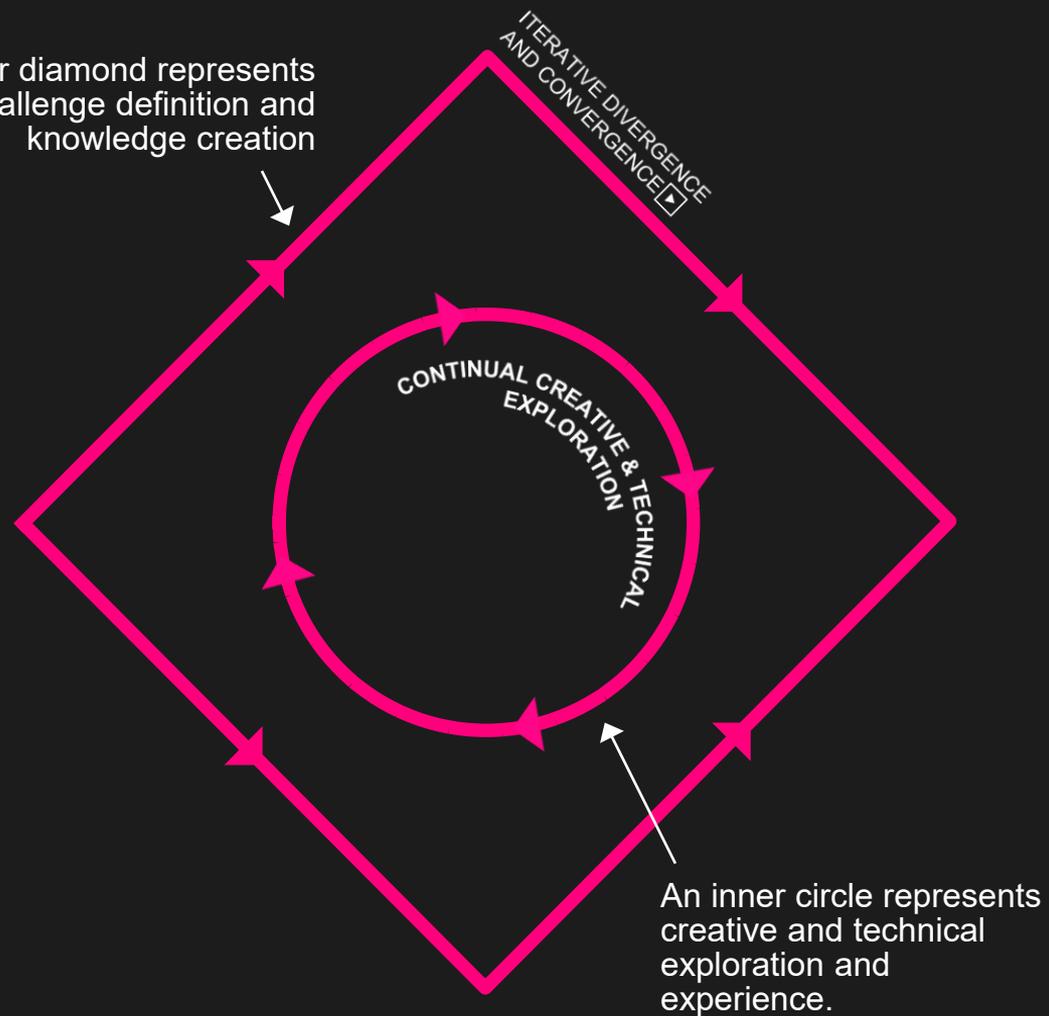


The dotted lines indicate **porosity and inclusion**.



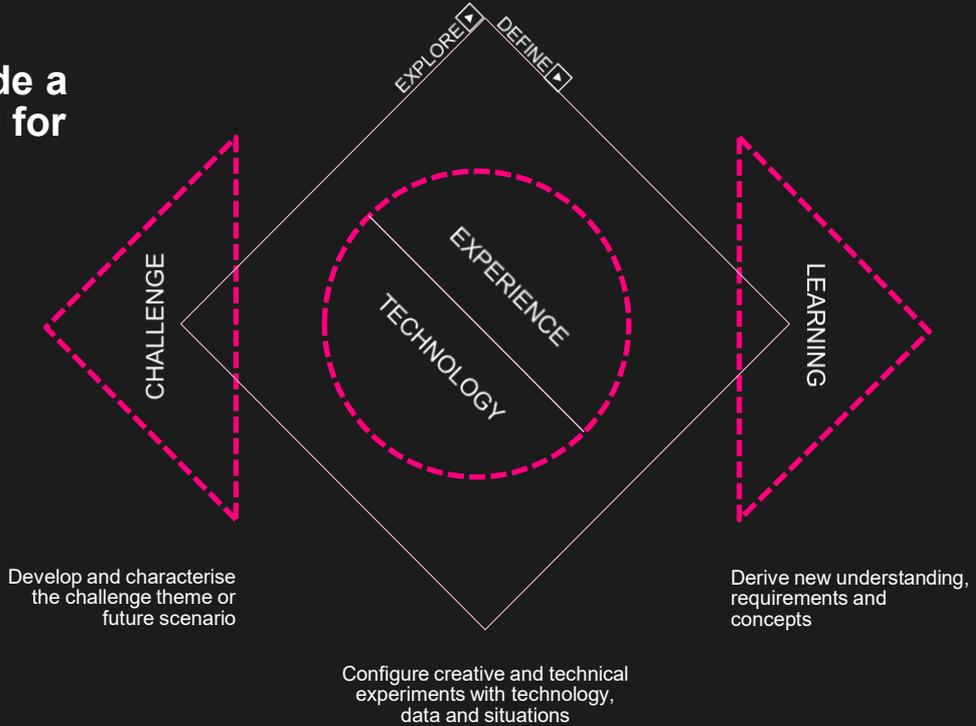
The gap between the diamond and circle represents the **boundaries we broker**.

An outer diamond represents challenge definition and knowledge creation



The diagram expands to provide a conceptual space and scaffold for the design journey.

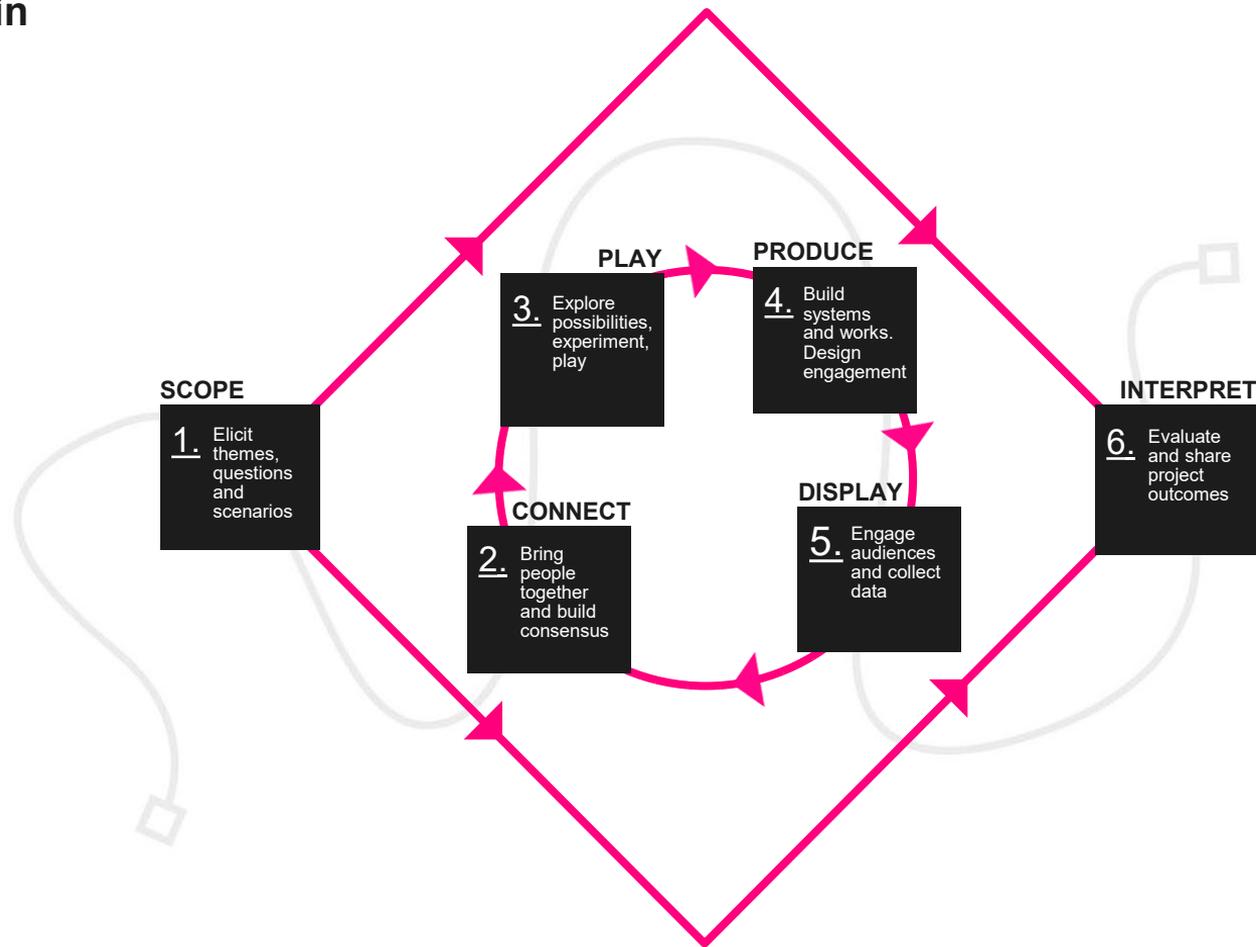
There are four dimensions
CHALLENGE
TECHNOLOGY
EXPERIENCE
LEARNING



There are six steps in a typical project

Steps can be repeated or completed in any order.

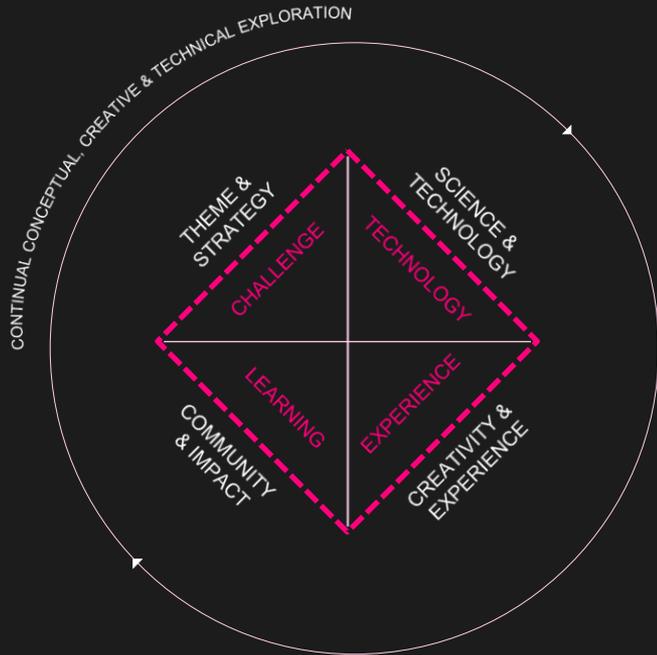
The toolkit offers a tool or method for each step.



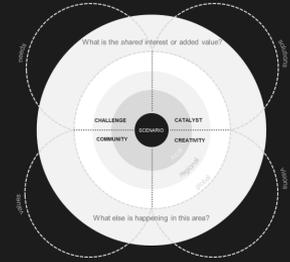
SCOPE
CONNECT
PLAY
PRODUCE
DISPLAY
INTERPRET

The toolkit includes a design canvas for each stage.

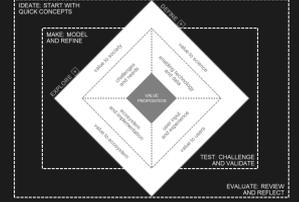
These tools enable you to explore the four dimensions as you develop your Open Prototyping project.



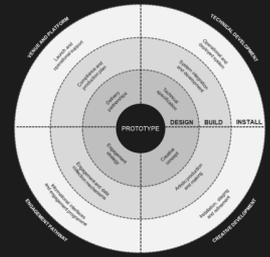
SCOPE



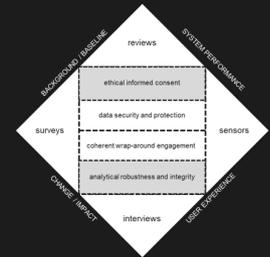
CONNECT



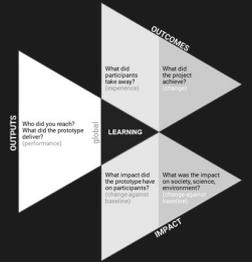
PLAY



PRODUCE



DISPLAY



INTERPRET



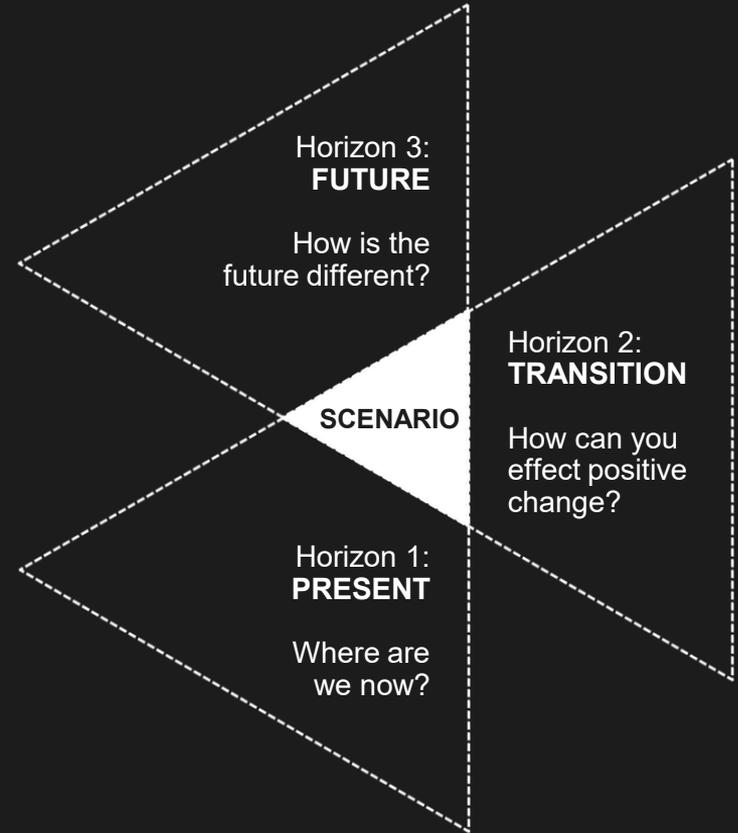
Open Prototyping

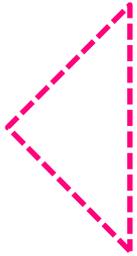
The tools

The Open Prototyping **SCOPE** Tool

In the Scoping stage of Open Prototyping, emerging social, technological, environmental and artistic challenges and opportunities are identified, mapped and framed as a concept scenario to help the team to begin to give shape to the project and set a strong foundation for collaboration.

In the Scope stage you should invite people to collectively brainstorm and think through critical issues and credible project directions that are valuable to collaboratively unpack through the Open Prototyping journey.





Purpose of the tool

The Scope tool enables you to set your project's direction and address critical issues and challenges, to help ensure the project outcomes are relevant to the people and the wider social and technological context in which it is situated.

What does it do?

This tool can be used in a brainstorming session with your team and stakeholders (e.g. community participants or experts in specific knowledge areas) to provoke rich discussions and insights to inform the project direction.

As it evokes a desirable future, it places all participants at an equal level to be able to express their interests, goals and ideas.

This tool is based on the Three Horizons foresight framework and helps you to simultaneously think through:

- Horizon 1: Present – Current challenges
- Horizon 2: Transition – Transformative action
- Horizon 3: Future – Future aspirations

How to use it?

Using the canvas on the next page, you and other participants can write on the sheet or use post-it notes to respond to the following:

STEP1: Ask participants to discuss their current challenges.

Encourage to contextualise these within their specific setting and also for them to identify opportunities arising.

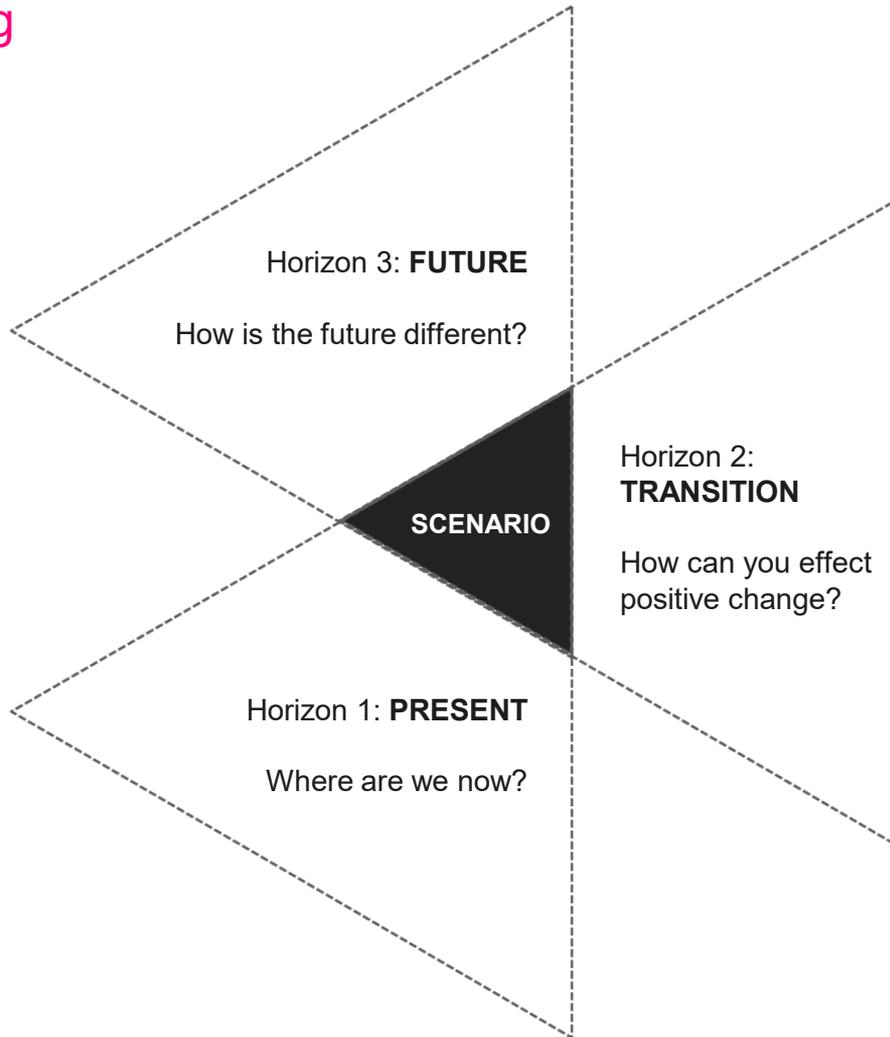
STEP2: Ask participants to discuss their future aspirations.

What would they like their future to be like? What solution can they foresee for the previously identified challenges?

STEP3: Ask participants to discuss what transformative action is required.

What kind of change is required? Who and what needs to drive change, and how? What uncertainties and risks are associated with that transition?

The Open Prototyping **SCOPE** Canvas



How do you capture outputs?

Conclude the brainstorming and discussion by reaching a consensus on a developmental narrative that can be captured in a scenario card.

Are there clear and common themes emerging? Is there anything unexpected that would be interesting to explore?

Using the template on the next page, capture the insights in a linear way, from the present starting point, through a transitional action, and towards a desirable future, thus forming a future scenario.

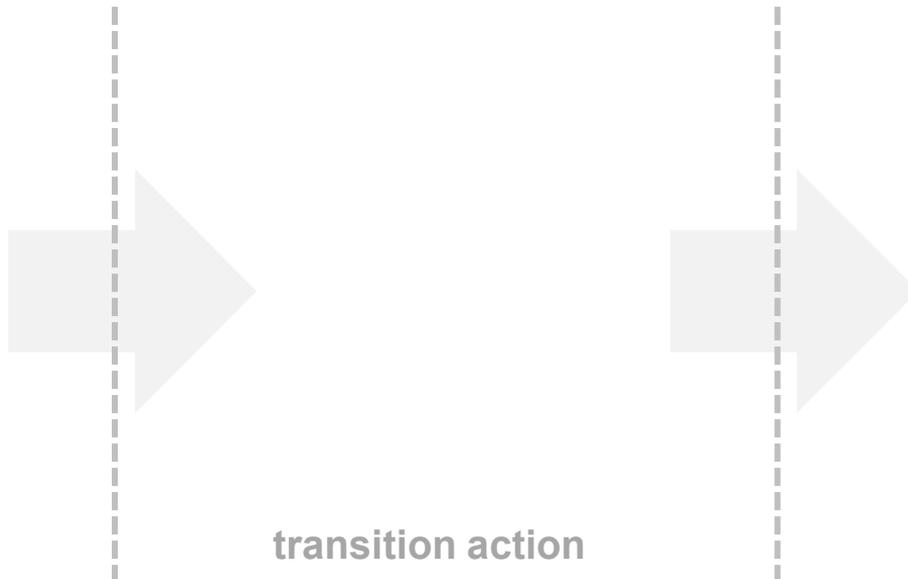
Context, such as participating stakeholders and required resources, are also captured. Provide a future date for the time horizon of the realisation of the desirable outcome.

The scenario cards are used as a resource to engage stakeholders in the further development of their desired future in the Connect stage.

SCENARIO CARD

CONTEXT (PLACE, STAKEHOLDERS, RESOURCES, VALUES, INTERESTS)

FUTURE TIME



present state

transition action

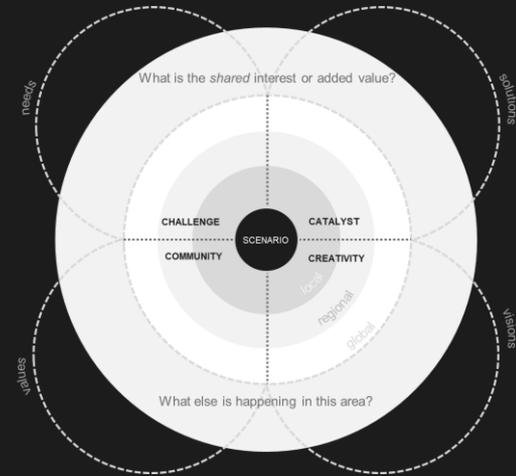
future outcome

The Open Prototyping **CONNECT** Tool

The primary objectives in Connect are to identify promising collaborations and build consensus on project directions.

The Connect stage invites you to map the relevant disciplinary expertise across artists, scientists, researchers, producers, stakeholders and community participants.

The stage enables the establishment of common resources and building ownership among participants.



Purpose of the tool

The Connect canvas invites you to think about the people you could connect with and resources you can draw in to explore the future scenarios further. It invites you to give equal consideration to the arts, technology and society.

What does it do?

At the centre, place a scenario, a set of themes or interests you would like to explore in this project.

Then explore who and what could be central to the project.

1. What is the societal challenge?
2. What technology and data could you employ?
3. What creative expertise is needed?
4. What kind of people are you looking to engage?

For each of the questions above consider:

- Who/what do you already have?
- Who/what could you engage?
- What are their interest, how the combine to add value?

How to use it?

STEP 1: Map the stakeholder ecosystem.

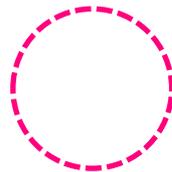
Explore and note the potential contributions available to each of the four areas. What are the core project group and current stakeholders looking to get out of it? How do you connect with new participants and align the scenario to their concerns?

STEP 2: Connect interests to shape added value.

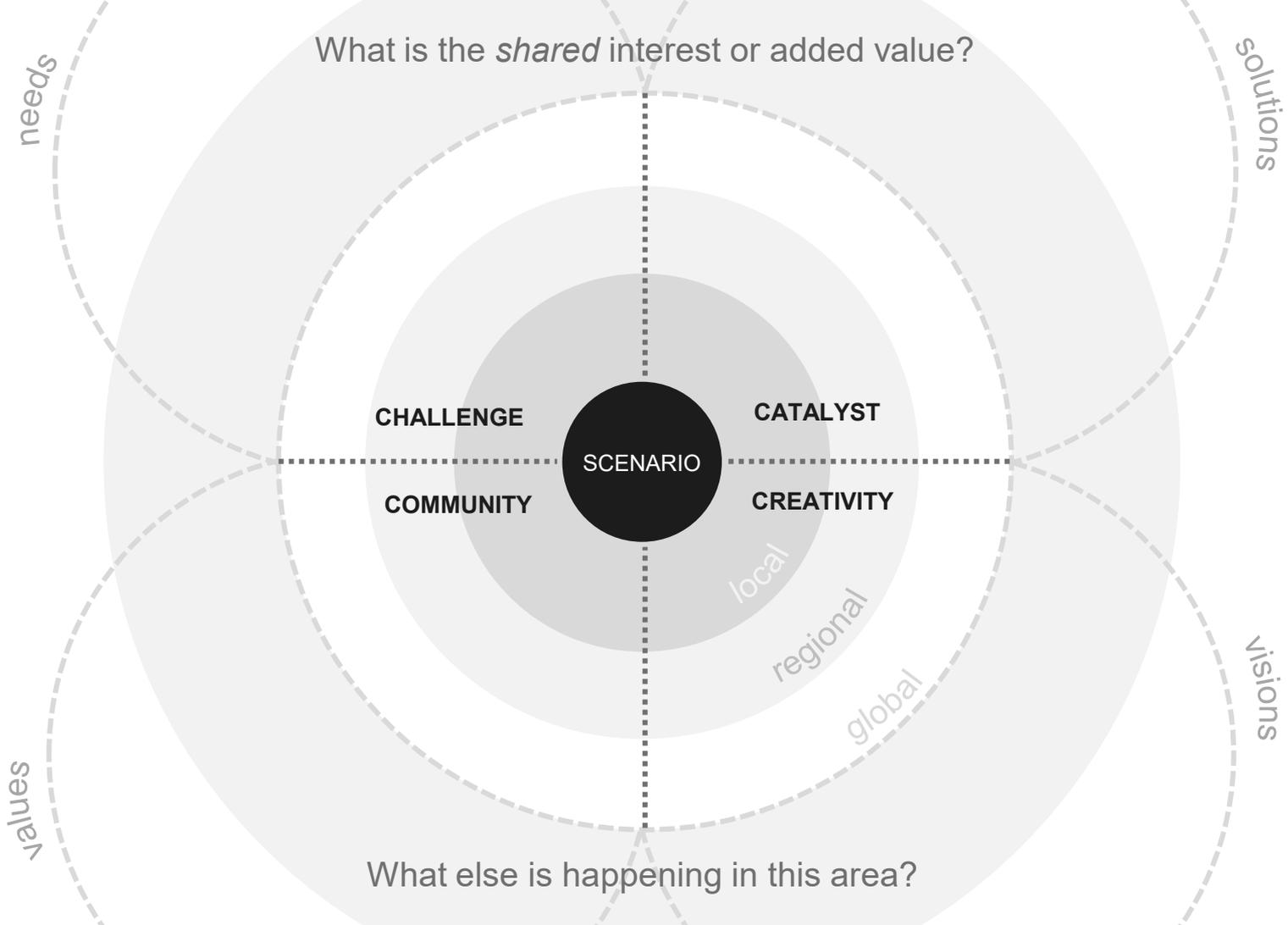
How do the questions or challenges of your team, partners, customers, funders or others in the industry connect? How is the project helping to answer them through aligning needs, solutions, visions and values?

STEP 3: Situate the project.

What is the wider landscape around this? What activities, products, work and events are there? What are the current and near future trends in the area?



The Open Prototyping
CONNECT
Canvas



How do you capture outputs?

Having mapped out the critical connections to stakeholders and negotiated their interests, these can be summarised in a 2 x 2 matrix diagram, showing both difference and similarities in the interests at stake.

Resources are in the outer subdivisions of the matrix, while stakeholders (organisations, teams, individuals, etc.) are in the middle ones. Questions in the matrix can help you validate your alignment.

This summary can enable you to effectively assemble an interdisciplinary team, but ensuring representation from all four quadrants and co-option of interests, values and resources available to all participants.

Who can give access to this space?
Who's voices have not been heard?

What skills, tools, infrastructure and other resources are available?
What data can you access?

resources

resources

stakeholders

stakeholders

CHALLENGE

CATALYST

COMMUNITY

CREATIVITY

What relationships, networks, platforms can be mobilised?
How do we recognise and measure impact?

What precedents can be established as inspiration and guidance?
How do these issues touch people's lives?

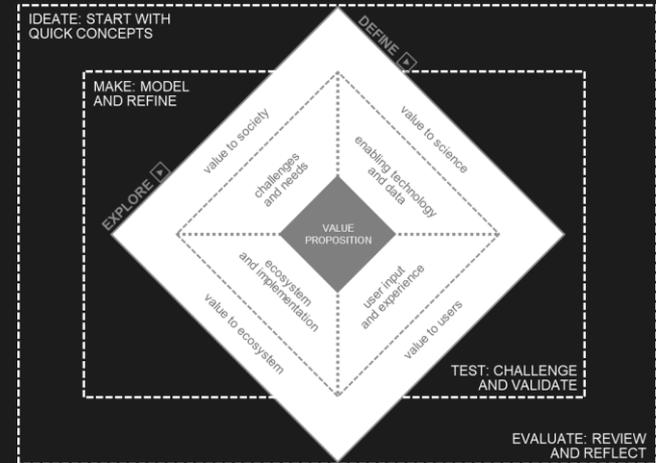
The Open Prototyping PLAY Tool

The Play stage involves creative and technical concept ideation and prototyping.

The collaborators can explore new territories, untangle different perspectives, reframe the applications of emerging technologies, and play out future scenarios, until they arrive at the core value proposition.

The value proposition is iteratively explored and shaped, and a first concept prototype is rapidly designed and tested.

This is a key stage where ideas are made tangible as a way to envision and try out possibilities.



Purpose of the tool

The Play canvas highlights the importance of imaginative exploration alongside more structured ideation and grounded evaluation. The tool enables you to communicate with your project team and gives structure to what is often a messy stage of the project.

How to use it?

STEP 1: Brainstorm and develop quick ideas.

Invite your project team to come up with a set of early stage needs and requirements that respond to the project scenario. Encourage these to be as specific as possible.

STEP 2: Build more refined value proposition.

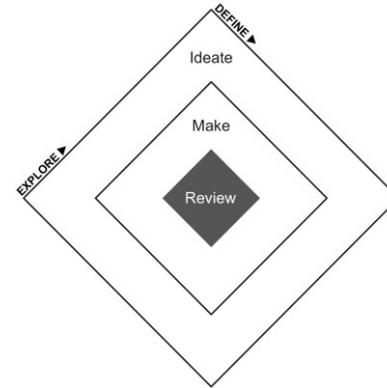
Building on the learnings from early concepts, discussions and evaluation, articulate the core value proposition that responds to the scenario and aligns to the interests of the project team.

STEP 3: Make things and test them.

Once you have arrived at something that might work, you should make it and test it out. This enables you to better understand and see any limitations to or possibilities.

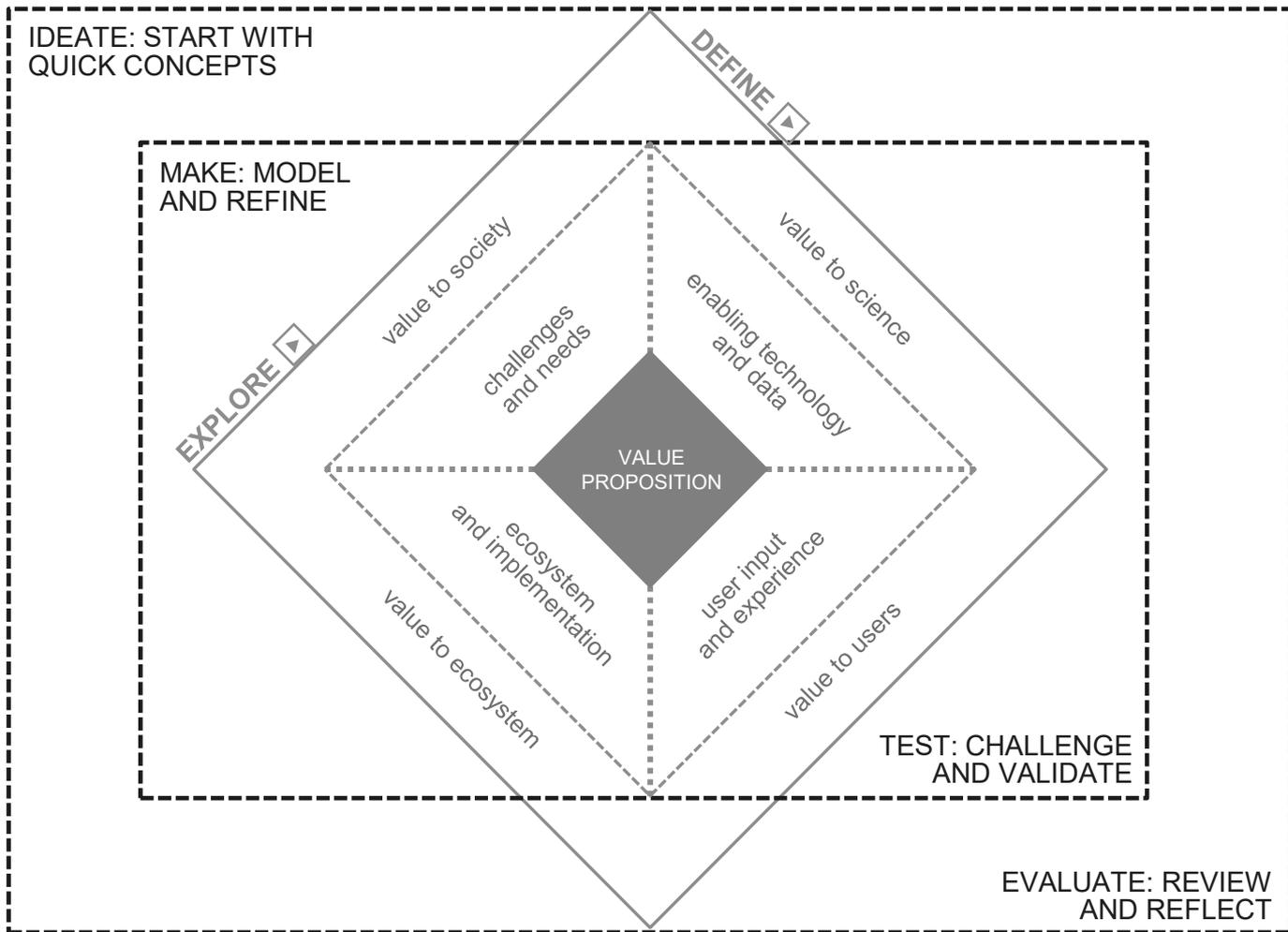
What does it do?

The Play tool is used for rapid brainstorming to open up new ideas. It encourages you to explore and create various concepts through phases of making and testing to move towards more concrete outcomes.



This open exploration is combined with consideration of key factors identified in the scenario and the landscape mapping during Connect. The tool enables you to account for those factors as you flesh out the prototype concept and negotiate value to all stakeholders.

The Open Prototyping
PLAY
Canvas



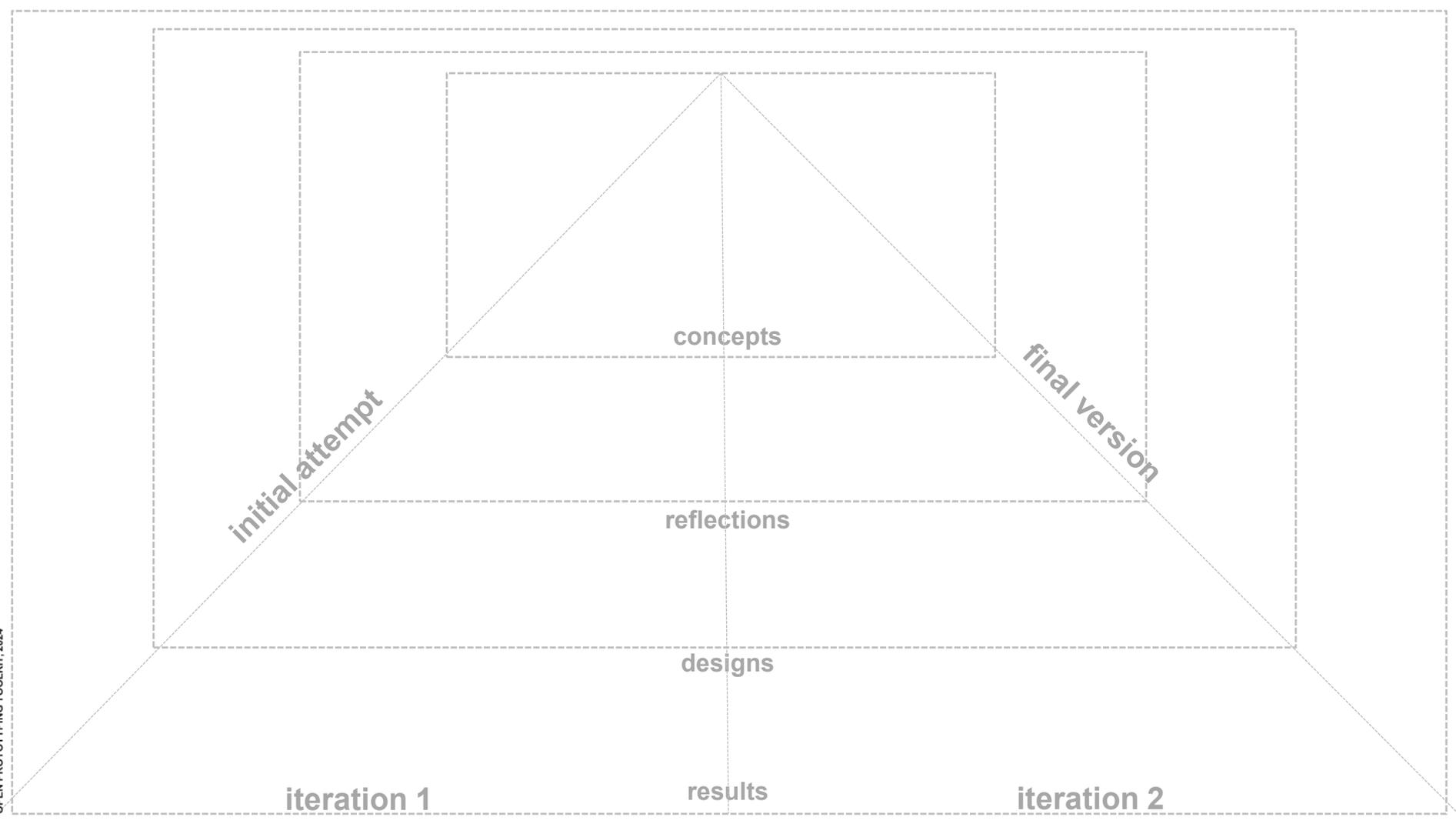
How do you capture outputs?

Play exercise outputs can be captured in two ways.

The iterative exploration of a prototype concept, based on the core value proposition can be mapped along a layered pathway canvas, shown on the following page.

Simply note the critical elements of each of the four dimensions for each iteration of the prototype and identify conceptual shifts that give rise to any tensions and challenges.

After a number of iterations, you can summarise the final prototype concept in a shareable brief card.



PROTOTYPE CONCEPT

DESCRIBE YOUR PRODUCT OR SERVICE CONCEPT

We address the challenge of _____

By building on a capability to _____

In a product/service/work that _____

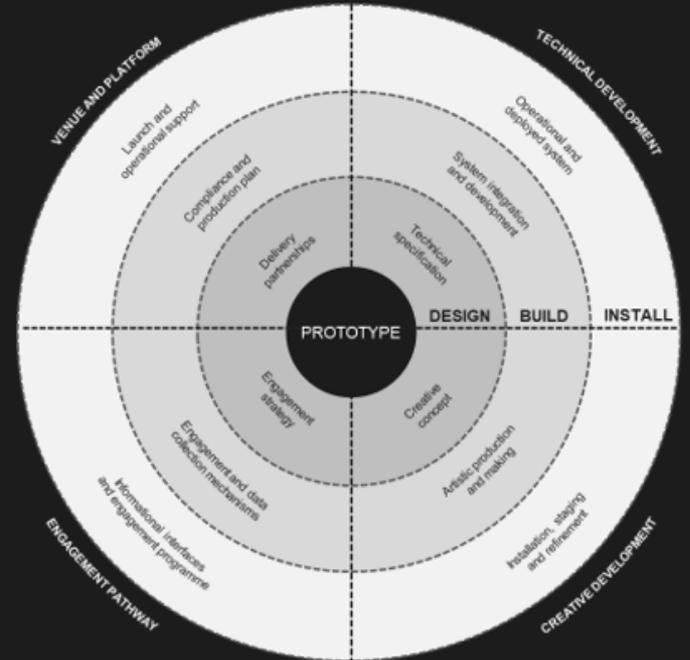
And demonstrate its impact through _____

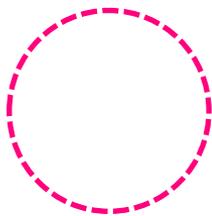
The Open Prototyping **PRODUCE** Tool

The prototype is built in the Produce stage of Open Prototyping.

In this stage, the value proposition and early design meets the real-world possibilities. Here we ask, how can we materialise this concept and exhibit it to the audiences?

Alongside the build and contextualisation of the prototype and its setting, engagement tools and materials are designed and created that help explain to the users the value and function of the prototype.





Purpose of the tool

The Produce canvas helps you specify the different components that need to be produced. It highlights the importance of combining diverse expertise and decision making, and enables you to evaluate how the concept was affected or changed by becoming a real-world experience.

What does it do?

Addressing the dimensions in this tool will help you develop the prototype and enabling infrastructure, and prepare for its launch to public or specialist audiences.

How to use it?

STEP 1: Final design.

Refine the plan to build the prototype/s. What data and technologies are needed? How are these configured? Do you need to bring in expertise from outside your team?

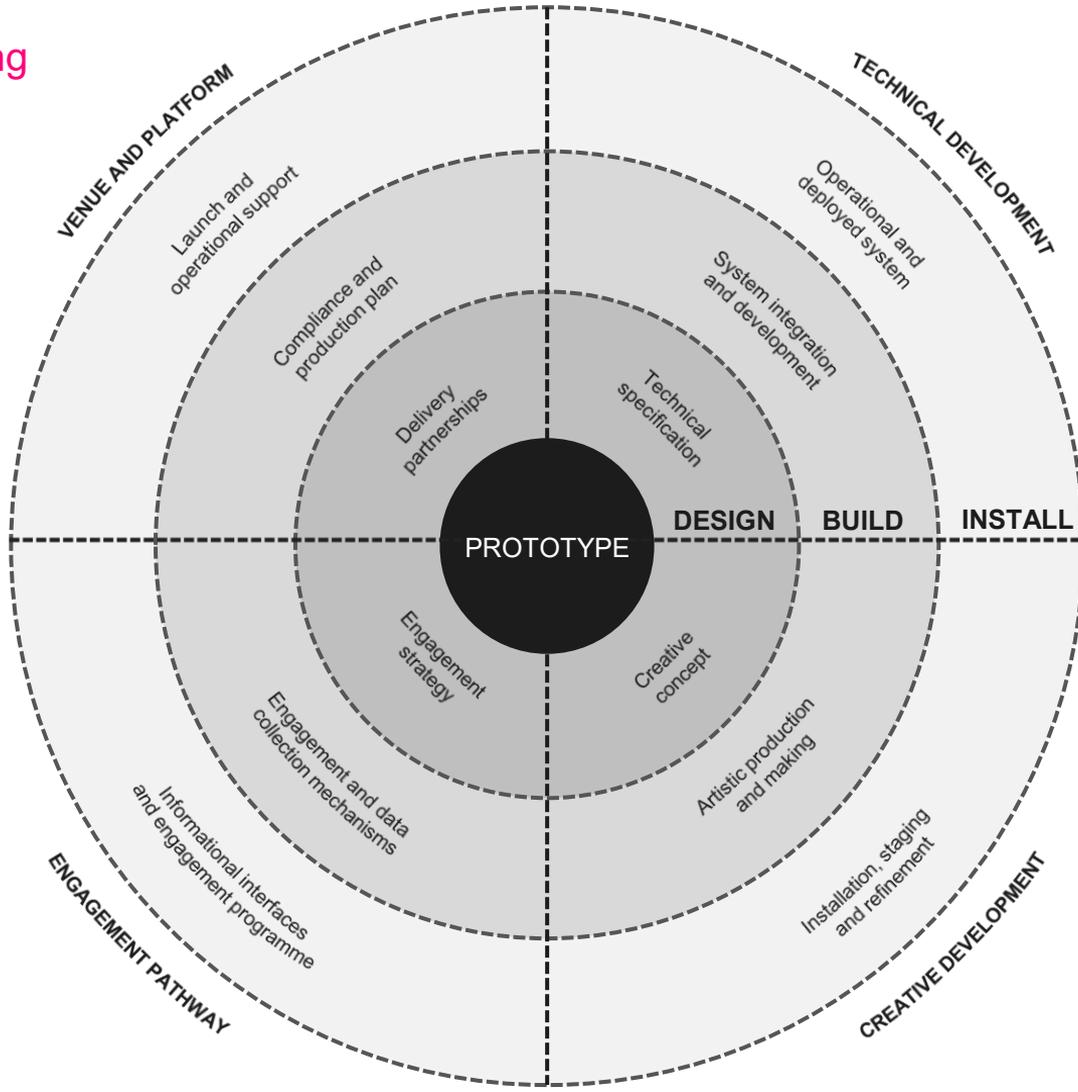
STEP 2: Propose the build.

Define the timelines and process of collaboration. What different assumptions may different contributors have? How and when can artists, scientists and/or community participants have their input?

STEP 3: Plan for launch.

Define where will you present the work and how? What existing audiences can you engage? How can you build new audiences? What venues or platforms could you access?

The Open Prototyping **PRODUCE** Canvas



How do you capture outputs?

Once you have considered all of the critical elements of the design, build and launch plans for your full prototype, you can capture them in an easily-shareable production brief.

Summarise the main points of each of the key there production steps and don't forget to include a realistic launch date.

Importantly, make sure you list all your systemic / environmental contexts and dependencies, to ensure your plans are viable and well-grounded in existing landscape and against existing other initiatives, products, services, etc.

The card can be periodically updated by ticking off completed tasks.

PRODUCTION BRIEF

PROTOTYPE CONTEXT (TYPE, PLACE, STAKEHOLDERS, RESOURCES, USERS)

LAUNCH DATE

platform design
technology R&D
creative vision
engagement programme

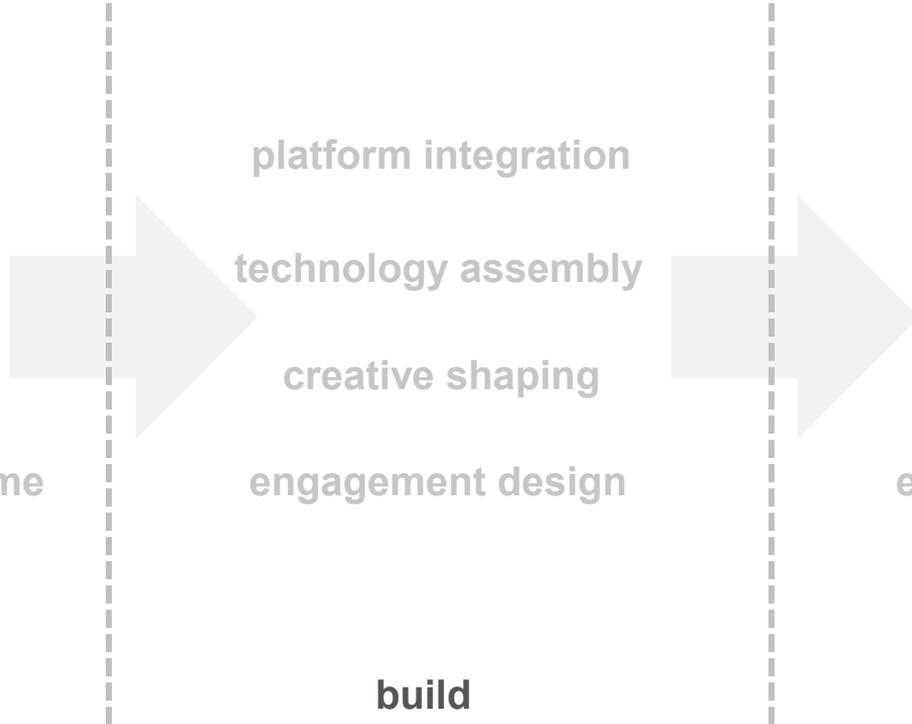
design

platform integration
technology assembly
creative shaping
engagement design

build

platform sharing
technology release
creative experience
engagement interaction

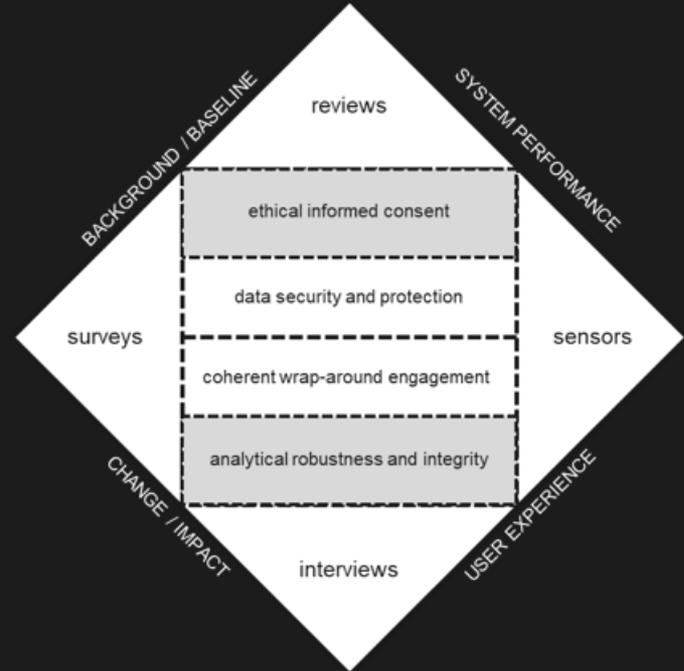
launch



The Open Prototyping **DISPLAY** Tool

In the Display stage, the prototype is shared to communicate, share, showcase or test the novel concepts, ideas and technological solutions.

It is a chance to test things out in real social contexts, and thereby explore and make visible their possibilities and limitations for future research and development in the field.



Purpose of the tool

This canvas invites you to set up a well-rounded data capture as the prototype is shared with users. Specific attention is paid to the ethical approach to the data collection and enabling robust, scientific analysis.

What does it do?

This tool allows you to plan effective ways to interact with your users/participants and capture data, ensuring you are not asking too much from them.

It reminds you to clarify the purpose of involvement to them, in order to clearly communicate why this data and this research approach is needed and obtain informed consent.

It suggests a number of different types of data collection, so you can choose the most appropriate (mix of) engagement tools.

How to use it?

STEP 1: Plan the required data collection.

Looking at what your prototype is trying to achieve, propose a set of empirical data concerning user interaction with it that would effectively assess its performance. Establish a baseline and benchmark for change.

STEP 2: Frame the data collection experience for the user.

Ensure data collection is not duplicate and as easy and integrated into the user experience as possible.

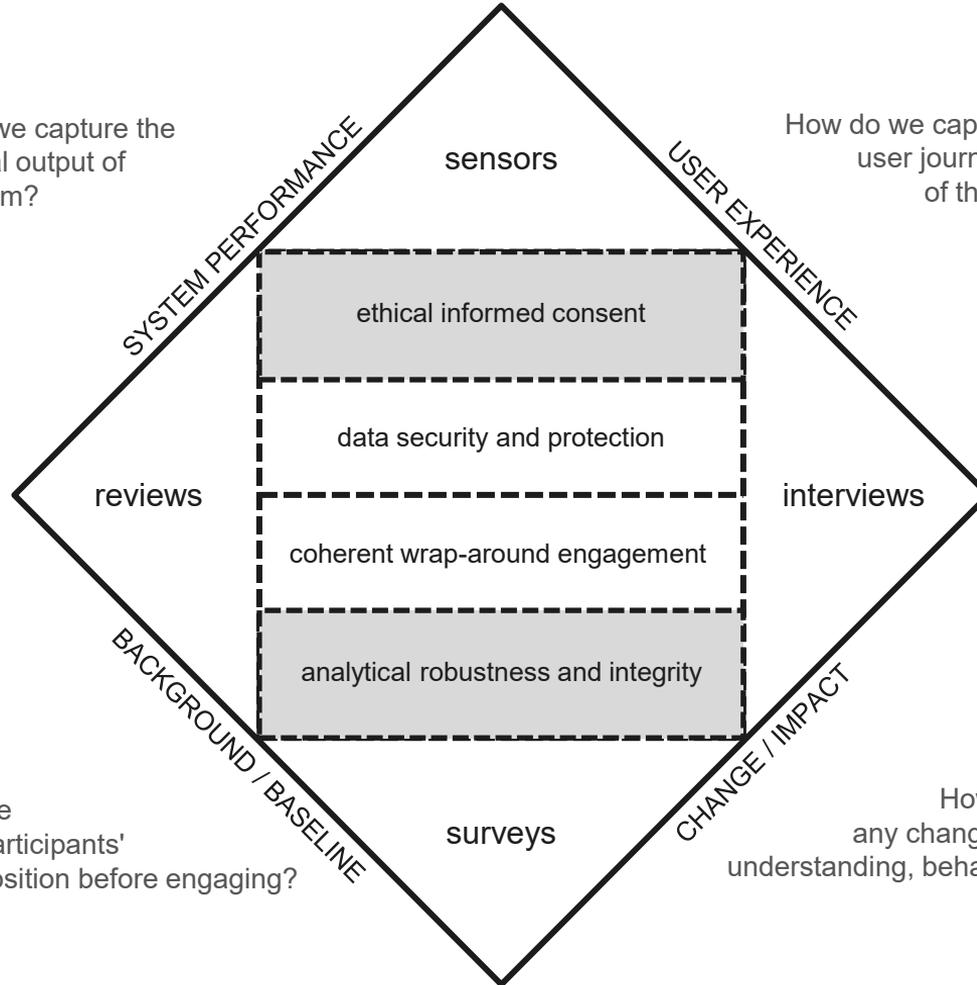
STEP 3: Develop protocols for informed consent and data analysis and storage.

Assess the totality of data collection and devise a seamless pathway to obtain informed consent. Develop a data storage and analysis plan, ensuring data will be used and kept safely.

The Open Prototyping DISPLAY Canvas

How do we capture the functional output of the system?

How do we capture the actual user journey and quality of the experience?



How do you capture outputs?

The different dimensions of data collection and analysis can be summarised in a structured pathway table.

The pertinent question is what, who and how is being gathered and processed, and how to ensure it is as seamlessly integrated into the prototype experience as possible, whilst retaining the ethical standards and scientific rigour.

Mapping the Display plans in advance also enables team engagement and information sharing, including briefing the involved participants (for informed consent) as well as colleagues collecting data (to understand their role better).

What data is being collected?

Who is collecting the data and how?

How is the data stored and processed?

baseline

performance

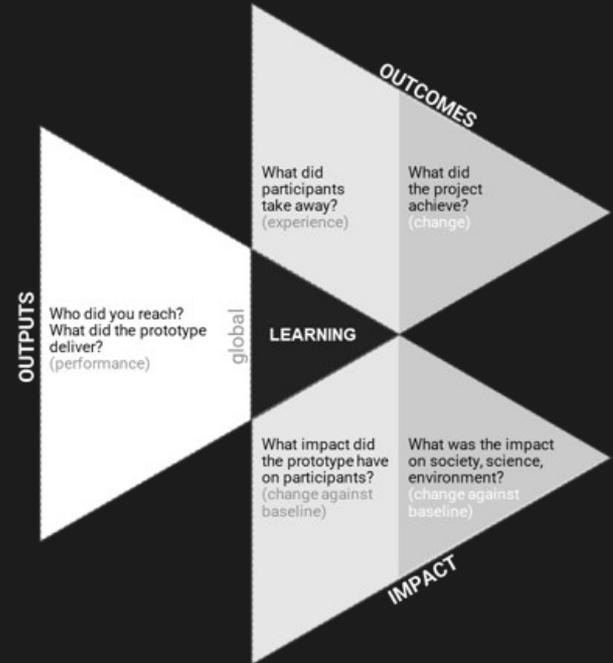
experience

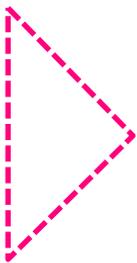
change

The Open Prototyping **INTERPRET** Tool

In the Interpret stage of Open Prototyping, data and observations gathered during the project and through the engagement of users are synthesised into a set of insights to drive future projects, technologies and practices.

These insights can be widely disseminated to publics, practitioners and policy makers through relevant formats and channels to inform their work and knowledge on the themes.





Purpose of the tool

The tool enables you to come together with your cross-disciplinary team to review the projects' journey and develop insights on its current and future outputs, outcomes and impacts.

What does it do?

The tool maps the value from the project inputs towards impact using an impact logic modelling approach.

How to use it?

STEP 1: Define the outputs and outcomes.

The outputs are measurable engagements with the prototype development and display, whereas the outcomes are the effects of these engagements. Has the project prompted any changes in current or future practices, activities, knowledge or feelings across in your stakeholders?

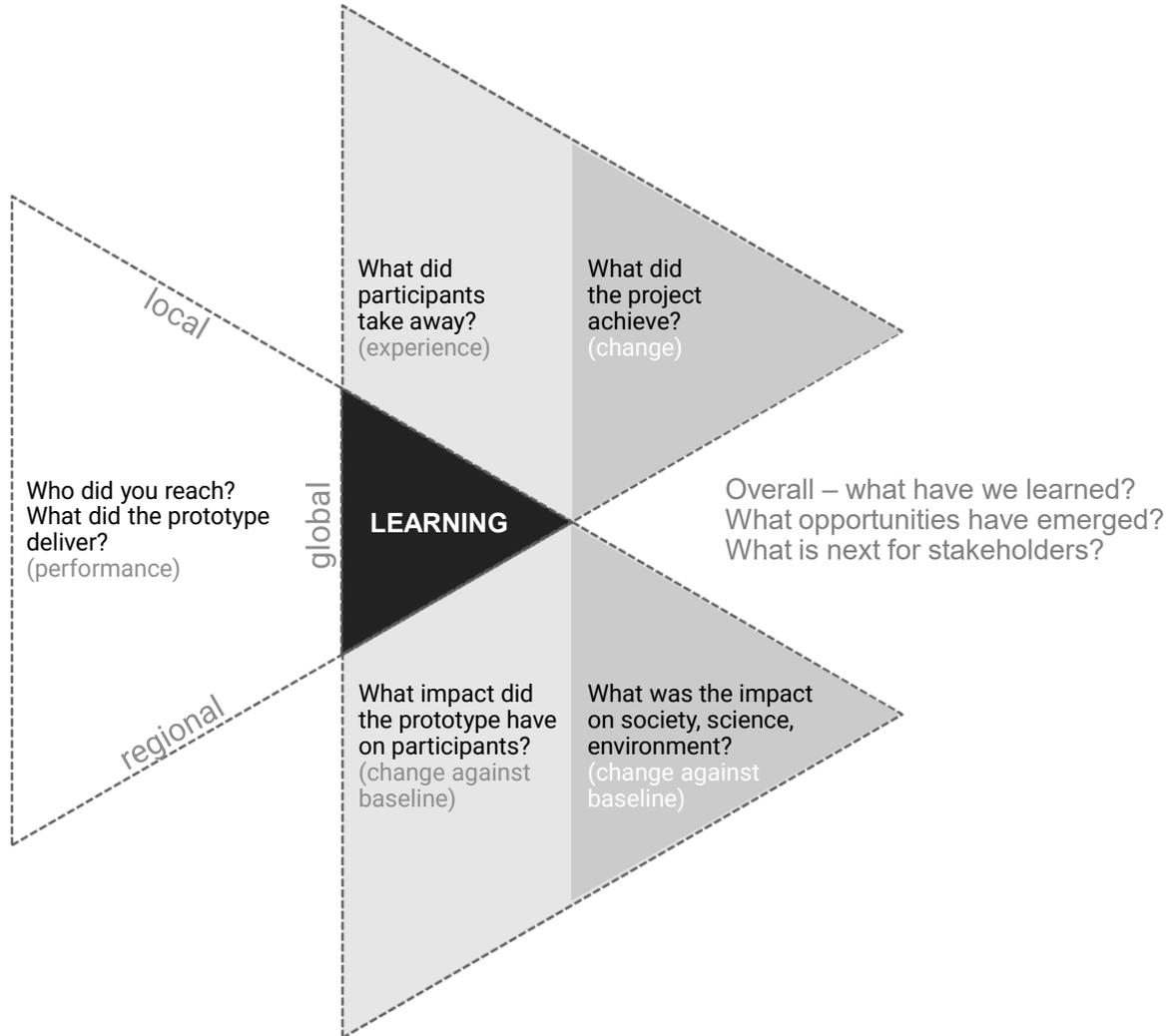
STEP 2: Articulate impact.

By bringing together outcomes and outputs, summarise the impact of the project.

STEP 3: List and disseminate insights and recommendations for future projects.

What were the emerging challenges and how were they addressed? What did you learn? What worked? What was not so effective? What would you do differently?

The Open Prototyping **INTERPRET** Canvas



How do you capture outputs?

By answering the prompts in each field you will be able to assemble together a sheet of information and structure that information in order to build insights about the project impact and insights to share.

This can help you and your team to reflect on the outcomes of the project and the prototype, assess the successes and shortcomings of the process, and the presentation and reception of the prototype.

You can use this sheet to communicate your project impact and findings to relevant audiences.

**WHAT WERE THE INPUTS
INTO THE PROJECT?**

resources

work

participants

infrastructure

**WHAT WERE THE
OUTPUTS?**

activities

artefacts

engagements

learning

**WHAT WERE THE
OUTCOMES?**

behaviour

innovation

appreciation

understanding

**WHAT IS THE
IMPACT?**

societal / cultural

scientific / technical

personal / community

economic / environmental

Key recommendations

Dialogue and collaboration: Sharing different perspectives are absolutely essential in this process. Facilitated workshops are an excellent way to bring people from across disciplines together for collaborative development and discussion to align their working and review progress against common goals.

Find comfort in uncertainty: Starting with an open experimentation can create uncertainty, e.g. “what are we actually making?” However, holding off determining the final outcomes too quickly and staying with the creative and collaborative process enables richer outcomes to emerge.

Invite an intermediary: An intermediary (e.g. facilitator, creative producer, curator) is often helpful, to understand and navigate the differences in perspectives and approaches and translate key knowledge, interests and concerns between participants.

Some practical delivery tips

Introduce: Prior to any activity, we suggest that participants have opportunities or time to get to know one another. This could be in the form of participants introducing themselves and their interests for a few minutes.

Ideate: Participants spend a few minutes reviewing the prompts and placing post-its as a silent activity. This is followed by group discussion.

Review: Ask the participants each speak briefly about a single contribution that they find most significant or interesting. Deliberate and prioritise as a group.

Timing: We suggest for any workshop to be approximately an hour to hour-and-a-half long to ensure that ample time is given to the exploration whilst maintaining participants' high energy levels.

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