CECAN Webinar - Innovation as a complex system: delivering a systems framework to measure impact within deep tech

cecan
Centre for the Evaluation of Complexity Across the Nexus

Monday 7th October 2024, 13:00 – 14:00 BST

Presenters: Brian MacAulay, Principal Economist and Teresa Miquel, Innovation Partner at Digital Catapult

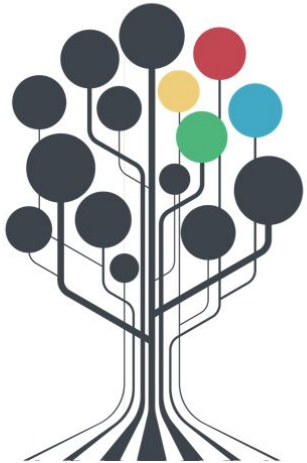
Welcome to our **CECAN Webinar.**

All participants are muted. Only the Presenters & CECAN Host can speak. The webinar will start at **13:00 BST.**

Brian and Teresa will speak for around 40 minutes and will answer questions at the end.

Please submit your questions at any point during the webinar via the Q&A box in the Zoom webinar control panel.

Today's webinar will be recorded and made available on the CECAN website.



E Mail: cecan@surrey.ac.uk
Web: www.cecan.ac.uk
www.facebook.com/CECANEXUS
Twitter: @cecanexus

Outcomes and Impact Monitoring and Evaluation process

Brian MacAulay - Principal Economist
Teresa Miquel - Innovation Partner

October 2024

AGENDA

1. About Digital Catapult
2. Context
3. Theory of Change
4. Outcomes framework

Digital Catapult is a deep tech innovation organisation driving business value by accelerating the application of advanced technologies

We're here to

Accelerate the application of deep tech to realise a better future

- Leading the way, shaping, and de-risking early adoption of advanced technology solutions.
- Empowering UK government, industry and academia to deliver transformational solutions and to thrive.
- Pushing new advance technology frontiers inclusively, responsibly and sustainably.

AGENDA

1 About Digital Catapult

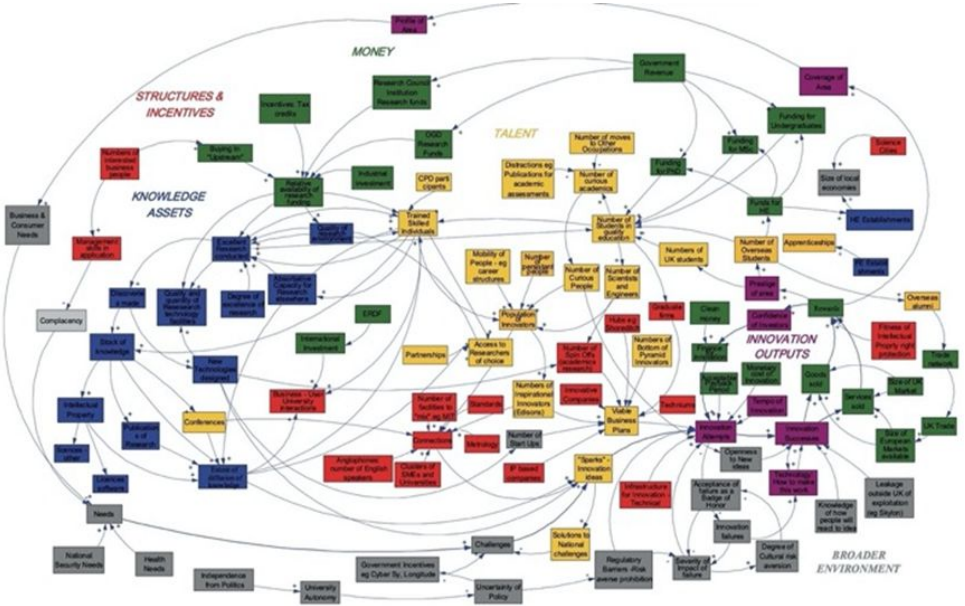
2 Context

3 Theory of Change

4 Outcomes framework

Innovation as a Complex System

- Large number of elements
- interactions are nonlinear
- Direct and indirect feedback loops
- open systems operating far from equilibrium
- Path dependent – they have memory
- Can lead to emergence of new structures
- Self-organising



Tera Allas (2014) Insights from international benchmarking of the UK science and innovation system – report to BIS

In his review of Catapults in 2016 Hauser noted:

- “In terms of policy interventions there is no silver bullet. Science and innovation function as a complex system that is highly interdependent, multi-faceted and nonlinear….The Catapults are one actor in a complex innovation system.”

Professor Dame Ottoline Leyser has made a strong point about evaluation:

- "…in any of these complex systems that we are talking about, in tracing that linear connection we are back to the seductive lure of linearity in systems that do not really have linearity.”

Catapults have been recognised as being ‘complex systems’, so we should evaluate them as such.

Holistic evaluation
Capturing direct and indirect impact

AGENDA

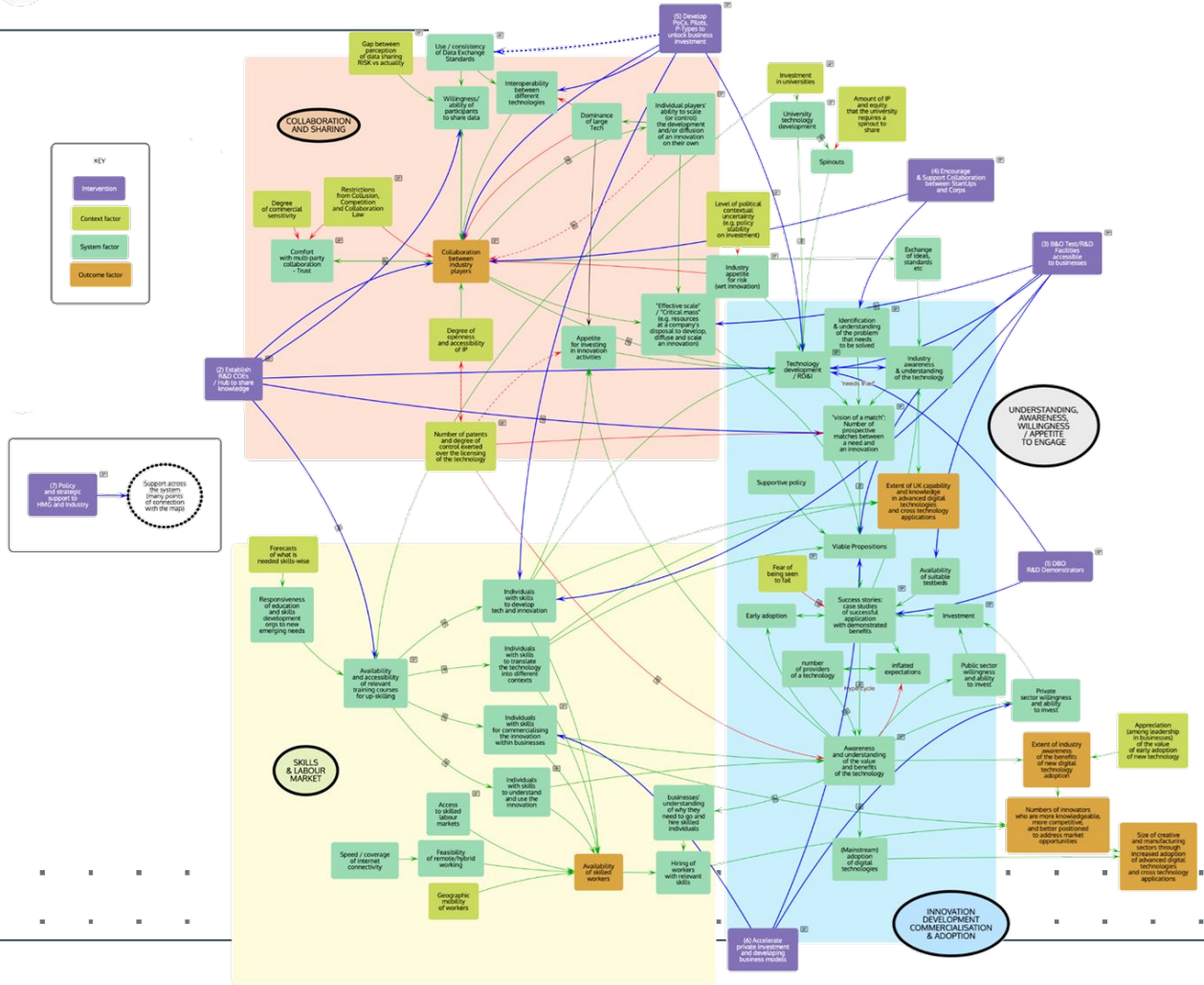
1 About Digital Catapult

2 Context

3 Theory of Change

4 Outcomes framework

Theory of Change



Theory of Change
Continuous evolution

Improvement plan

- ✔ Need for alignment with outcomes framework
- ✔ Prioritisation of recommendations for ToC contextualisation to DC

System map and Theory of Change 1.0
Digital Catapult commissioned **CECAN** to help develop their Theory of Change

June - July 2022

- ✔ Participatory System map
- ✔ Theory of Change 1.0
- ✔ Strategic tool for impact identification

System map Theory of change document

Theory of Change review
Diagnosis and recommendation of areas of improvements, led by a group of master candidates from UCL's IIPP

May - June 2023

- ✔ Key diagnosis
- ✔ Alignment opportunity with other internal tools
- ✔ Usability assessment

Recommendations: areas of focus and suggested roadmap

Stage 1: ToC 2.0 structure
Definition of how to reflect the activities in the Theory of Change and how to align with Outcomes framework

Sep - Dec 2023

- ✔ Preliminary definition of the main areas of support Digital Catapult provides
- ✔ Refinement of impact areas to capture

Reframed impact areas and preliminary areas of support to capture

Internal interviews
Interviews led by the economics team across the different functions analysing the key areas identified and prioritised

Dec - Jan 2024

- ✔ Refined areas of support to map in the Theory of Change
- ✔ Understanding of how each function provides support

List of areas of support with typical activities within them

ToC update
Review of all elements and dynamics, reframing impact areas, changing how support is mapped

Feb - May 2025

- ✔ Clear identification of how each impact area overlaps with the other
- ✔ Clear identification of how each area of supports affects each impact area

Venn diagram with impact areas and where the area of support sits within

AGENDA

1 About Digital Catapult

2 Context

3 Theory of Change

4 Outcomes framework

Summary

The Outcomes framework aims to **standardise** our approach to measuring our outcomes across projects and programmes, establishing a process to monitor and evaluate them in a structured way, capturing data in a timely, consistent and robust manner. The framework will provide **evidence** on how the metrics monitored have changed after the engagement

It also matches the project/programme's outcomes to DC's strategic outcomes, and maps them into our Theory of change (map), making it a key source for DC's impact evaluation at the end of the 5-year grand period

The framework standardises how we collect data and the metrics through a **taxonomy**:

4 overarching themes
aligned with other frameworks to facilitate comparisons and translations, such as ISO.

9 concrete types
that describe the different areas of focus within each theme

30+ standardardised metrics
that represent different ways to achieve the desired outcome

Glossary

KPIs

Metrics that show how we are achieving key objectives. They are focused on operational aspects or results, such as the number of small and large companies engaged, or PoC produced in our programmes

Output

Direct results of the activities, and can be a project deliverable. It is directly linked to programme activities, such as publishing a blog post, or producing a toolkit

Outcome

Mid-term change that occurs as a result of the intervention, i.e. increase in knowledge, new products developed, number of people entering employment. These are subject to multiple influences and take time to materialise

Impact

Significant and wider effect resulting from the outcomes achieved. An impact is attained in the long term, such as driving private investment, creating high-value jobs or increased competitiveness

How we capture our results

Build up process from micro to macro level

Capture data at **organisation** level

Allowing us to build impact stories

Project / cohort's **aggregated results**

Letting us learn from each delivery

Identification of the contribution to DC's **strategic outcomes**

Aligning every project to our strategy

Map interventions into our **Theory of change**

Capturing impact in the innovation ecosystem

Micro level → **Macro level**

Taxonomy

Theme	Type	Metrics
Innovation	❖ Technology development ❖ Collaboration ❖ Knowledge	**30+** outcomes metrics
Economic, social and environment	❖ Business growth ❖ Investment ❖ Responsible innovation ❖ Sustainability	**For each project/programme:** Choose **up to 15 outcomes metrics** in total across themes and types
Operational	❖ Efficiency in operations	
Delivery	❖ Programme / project overall feedback	

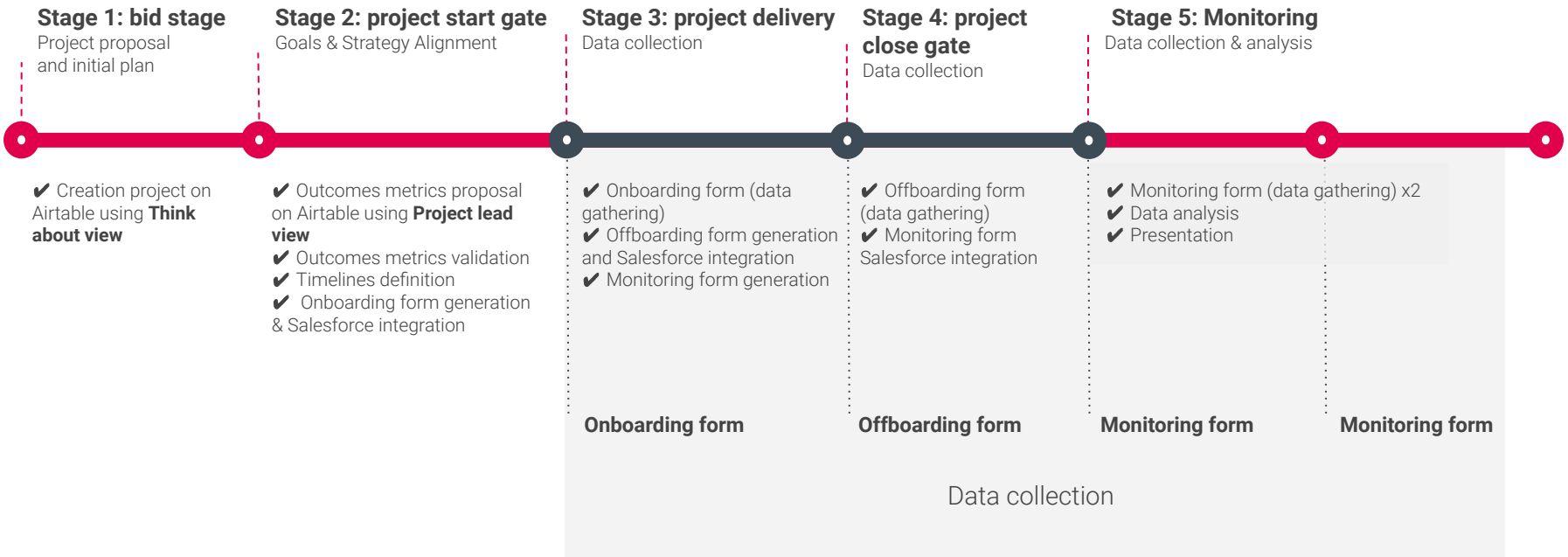
Work in progress

Project classification

Type of project	
Accelerator	Experiment
	Validate
	Grow
Ecosystem building	
Consultancy	
Field lab	

Main support focus
Tech development
Solution development
Business support
Investment
Knowledge creation & sharing
Network building
Responsible innovation

Process



For more details, refer to official Outcomes Framework Resource Manual & Handbook

Tools

Learning

Resource Manual
Explaining the Framework, taxonomy, process and governance

Handbook
Step-by-step guide showing how to complete the One-Page

Metric selection

Colour-coded document displaying the outcomes that a project aims to achieve

- List the type of project, metrics, timelines
- Airtable for metric selection*

Data collection forms

- Send via Salesforce, storing and structuring the data
- Salesforce integration of forms to send to cohorts
- Forms template for easy structure
- Predefined questions for standardisation

*Limited licenses. Please request editing permissions when you need to add a project. After two weeks, the license can be re allocated to another team member


CATAPULT
Digital
Thank You
Digital Catapult