UNLOCKING ENGINEERING CREATIVITY:
DESIGN SPACE VISUALISATIONS TO SUPPORT INNOVATION

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CREATIVITY AND INNOVATION ARE KEY

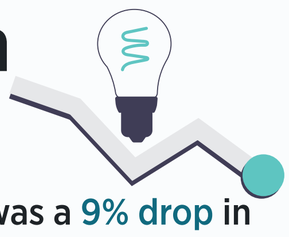
Essential skill #4

Creativity is a top 5 skill now and for the future according to the WEF.[1]

Innovation & the SDGs

Innovation is a driver of manufacturing output and the SDGs.

Innovation in decline



In 2020-2022, there was a 9% drop in innovation active businesses in the UK.[2]

BEYOND 'THINKING OUTSIDE OF THE BOX'

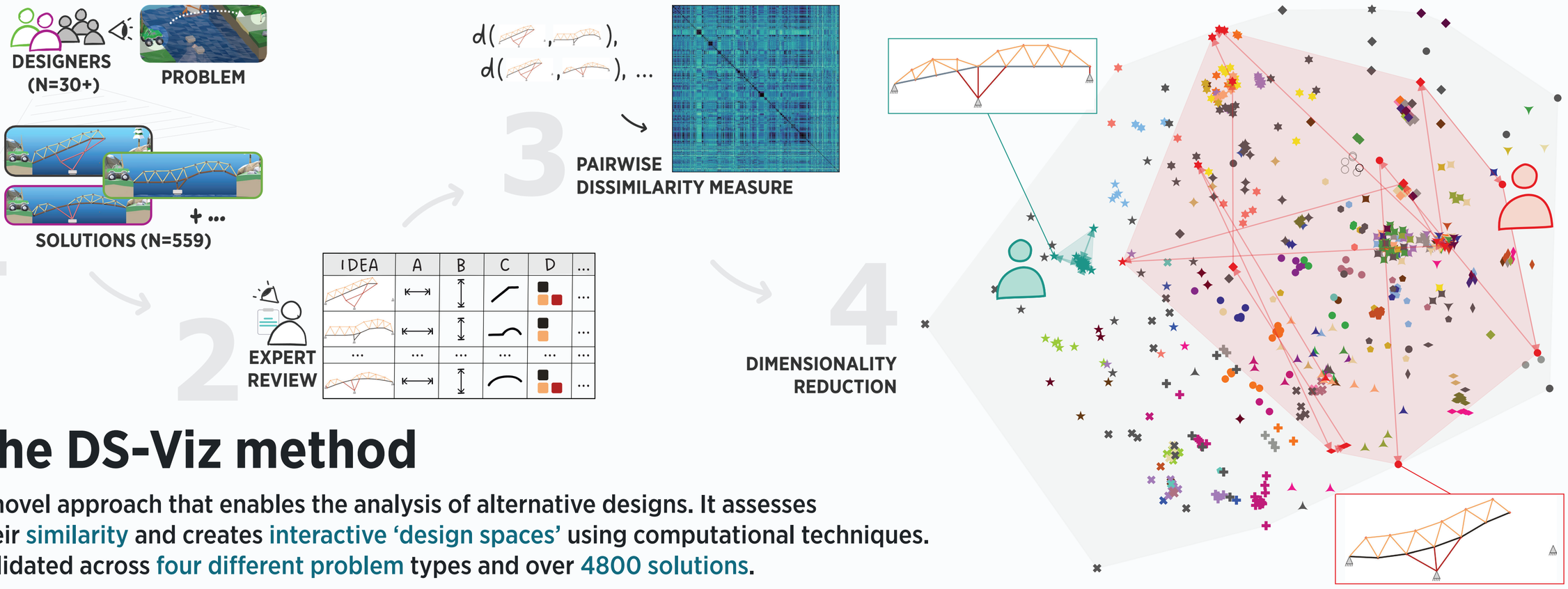
What *is* the 'box'?

'Thinking outside of the box' became a synonym for creativity. Understanding what the box is and how to explore it can support creative endeavours. Design research can help!

Design spaces

These are the collection of alternative solutions for a specific problem. Design space visualisations show how varied the ideas are and how broadly designers have explored the space.

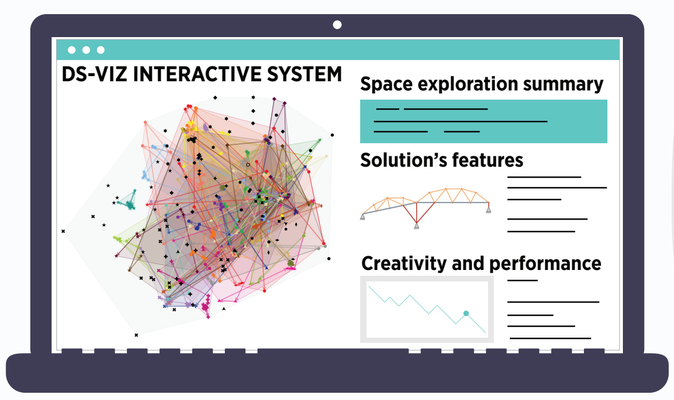
TOWARDS VISUALISING DESIGN CREATIVITY



The DS-Viz method

A novel approach that enables the analysis of alternative designs. It assesses their similarity and creates interactive 'design spaces' using computational techniques. Validated across four different problem types and over 4800 solutions.

DESIGN SPACES TO SUPPORT ENGINEERS



EDUCATION

These visualisations can be used for student feedback, scaffolding future engineers' learning and creativity.

PRACTICE

Design spaces could be integrated into CAD software for real-time feedback for designers.

RESEARCH

Novel approaches to investigate creative behaviour and promote innovation.

1. The Future of Jobs Report 2025, World Economic Forum. 2. UK innovation survey 2023: report, Department of Business and Trade.

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