The Discipline of Design in Complex Systems

System complexity

Systems expertise appreciates the multiple components, their relationships and interactions. The Cynefin model describes different classes of systems. Understanding the type of system allows the right choice of response.

- Complex systems: Those systems have emergent behaviour. They cannot be described in terms of simple additivity or superposition of component parts. Examples: Traffic systems, healthy systems.
- Complicated systems: Those systems have many interacting components that are contingent and can generate many outcomes. Examples: Traffic systems, healthy systems.
- Chaotic systems: Those systems are completely unpredictable and random. Examples: Natural disaster, terrorist attack, natural disaster.
- Simple systems: Those systems can be easy to observe, and understand. Examples: Light switch, Swiss watch.
- Probal systems: Those systems are completely unpredictable and random. Examples: Natural disaster, terrorist attack, natural disaster.

Lead and manage design

The designer is creating preferred futures therefore is optimistic. They have the conviction to keep going even when others may give up. They bring pace, energy, and direction to the design process. They look to the time available and chart the best course of action.

Whilst design in complex systems is a creative process, it also is disciplined so that it reaches a solution. Central to that discipline is understanding that there is a time for divergence and a time for convergence. Divergence generates opportunities and options. Convergence evaluates them and makes decisions. Both are important.

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The designer brings nobility and humility. They aim to foster inclusivity and ambition that they encourage. They bring the capacity to understand, to set clear goals, to engage with all voices, and to respond using behavioural insights and inspiration.

Foresight

Foresight is not the same as forecasting. Foresight is about seeing the disruptive forces that could change the future. You can imagine what could happen and test your strategy accordingly.

Insight

Insights point to future opportunities. An insight is a clear, deep, and sometimes sudden understanding of a problem or situation.

- Why was this happening?
- What has caused the current situation?
- What are the further reaching effects?
- What design questions does this raise?

Impact at scale

The complex system designer recognizes that every intervention they make will be experienced by someone somewhere. They have an obligation to make that the best possible experience.

What are the disruptive challenges we need to prepare for the future?
- Recognize the ecosystem is dynamic, interconnected, and displays emergent properties.
- Design changes that aggregate, excite, and engage.
- Identify and mitigate parts of the systems that are naturally working well.
- Amplify and leverage parts of the system working against the overall goals.

Zoom

Designing in complex systems requires the agility to think at many different scales in the system. We zoom between global systems and a person's deep lived experience. We zoom up for perspective and zoom in to make sense of, and build empathy for humans interacting with the system. We observe at different fricatals of the system.

Design thinking oscillates between these different layers of the scale. Each zoom gives a different perspective of the same integrated system.

- Time
- Impact at scale
- Foresight
- Human experience
- System complexity

No one experiences the whole system. People experience their own pathway through it.

- Richard Buchanan

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Everyone designs who devises a course of action aimed at changing an existing situation into a preferred one.

- Herbert Simon

Understanding the type of system allows the right choice of response. Systems expertise appreciates the multiple components: their relationships and interactions. The interaction between people and the systems they interact with influences the outcome of the systems themselves. How they respond to one another determines the future.

The designer is creating preferred futures therefore is optimistic. The designer brokers all voices, and be responsive. They help everyone to voiceless. They help everyone to engage with all voices, and be responsive. They help everyone to

- Understand the breadth and complexity of the systems using engagement at scale and big data
- Develop scenarios to test planned actions
- Extrapolate the system and the human insights over time
- Facilitation guided by strong ethics to innovate and scale
- Gain deep empathy for the depth of human experience through human centred design and ethnography
- Design thinking oscillates between these different layers of the scale. Each zoom gives a different perspective of the same integrated system.

The complex system designer works with the dynamics of the system.

- Identify, and alternate parts of the system working against the overall goals
- Amplify and leverage parts of the system working against the overall goals
- Identify a small number of high level solutions of impact at the scale that are closest to convergence
- Constantly navigate towards impact at scale, looking for unintended consequences
- Amplify and leverage parts of the system working against the overall goals
- Identify and attenuate parts of the system working against the overall goals

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