# MASTERING DESIGN IN COMPLEX SYSTEMS

- System complexity
- Foresight
- Zoom
- Impact at scale
- Lead and manage design
- Time
- Human experience
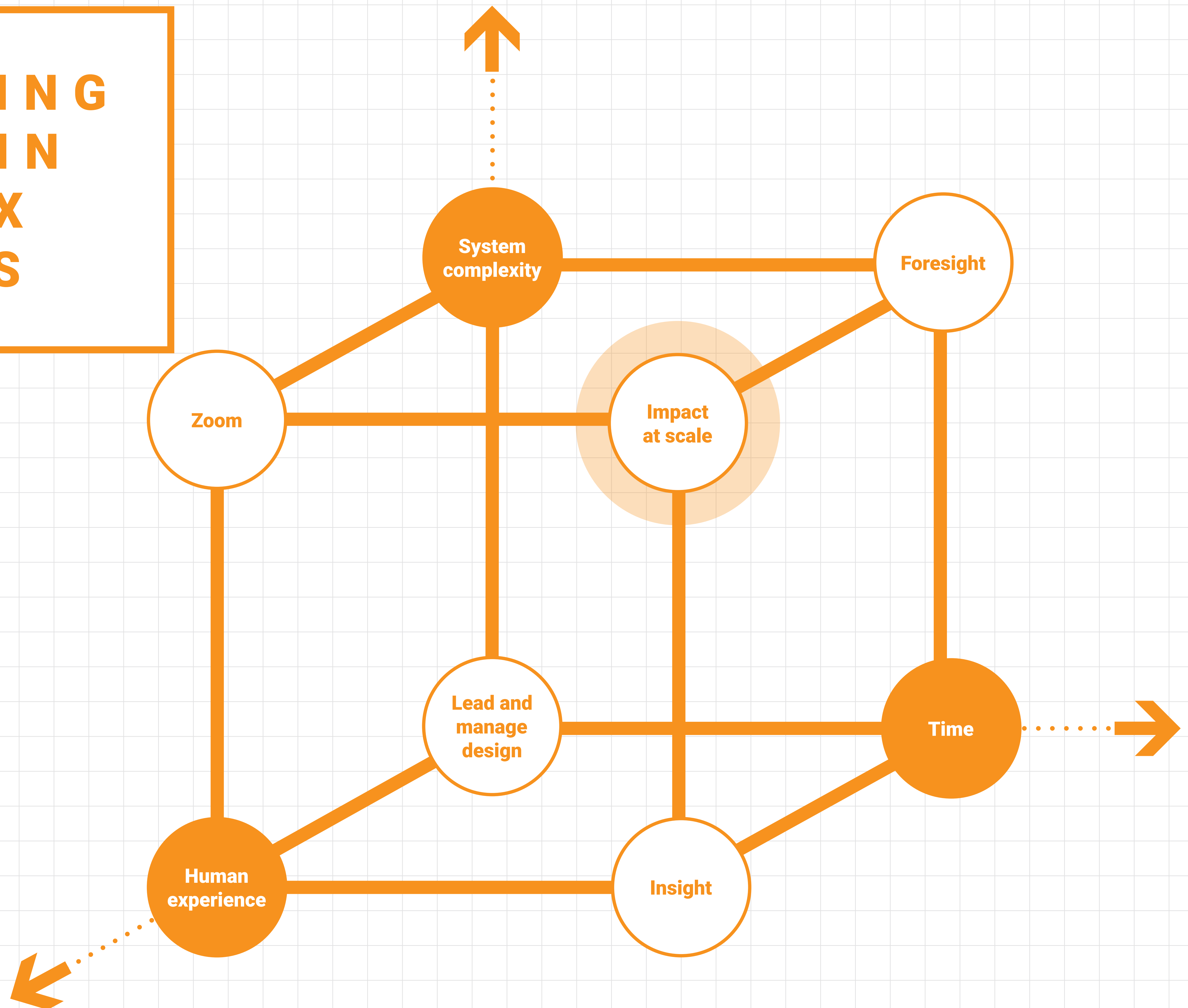- Insight

# 1

# 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.

## NOT PREDICTABLE

### Complex systems

These systems have emergent behaviour. They comprise many independent agents and display patterns of collective behaviour.

Examples:
• Traffic systems
• Health systems

Probe → Sense → Design → Act

## PREDICTABLE

### Complicated systems

These systems have many interacting components that are completely predictable.

Examples:
• Swiss watch
• Computer code

Sense → Analyse → Design → Act

### Chaotic systems

These systems are completely unpredictable and random.

Examples:
• Terrorist attack
• Natural disaster

Act → Sense → Respond

### Simple systems

These systems can be easy to observe and understand.

Examples:
• Bouncing ball
• Light switch

Sense → Categorise → Act

# HUMAN EXPERIENCE

"

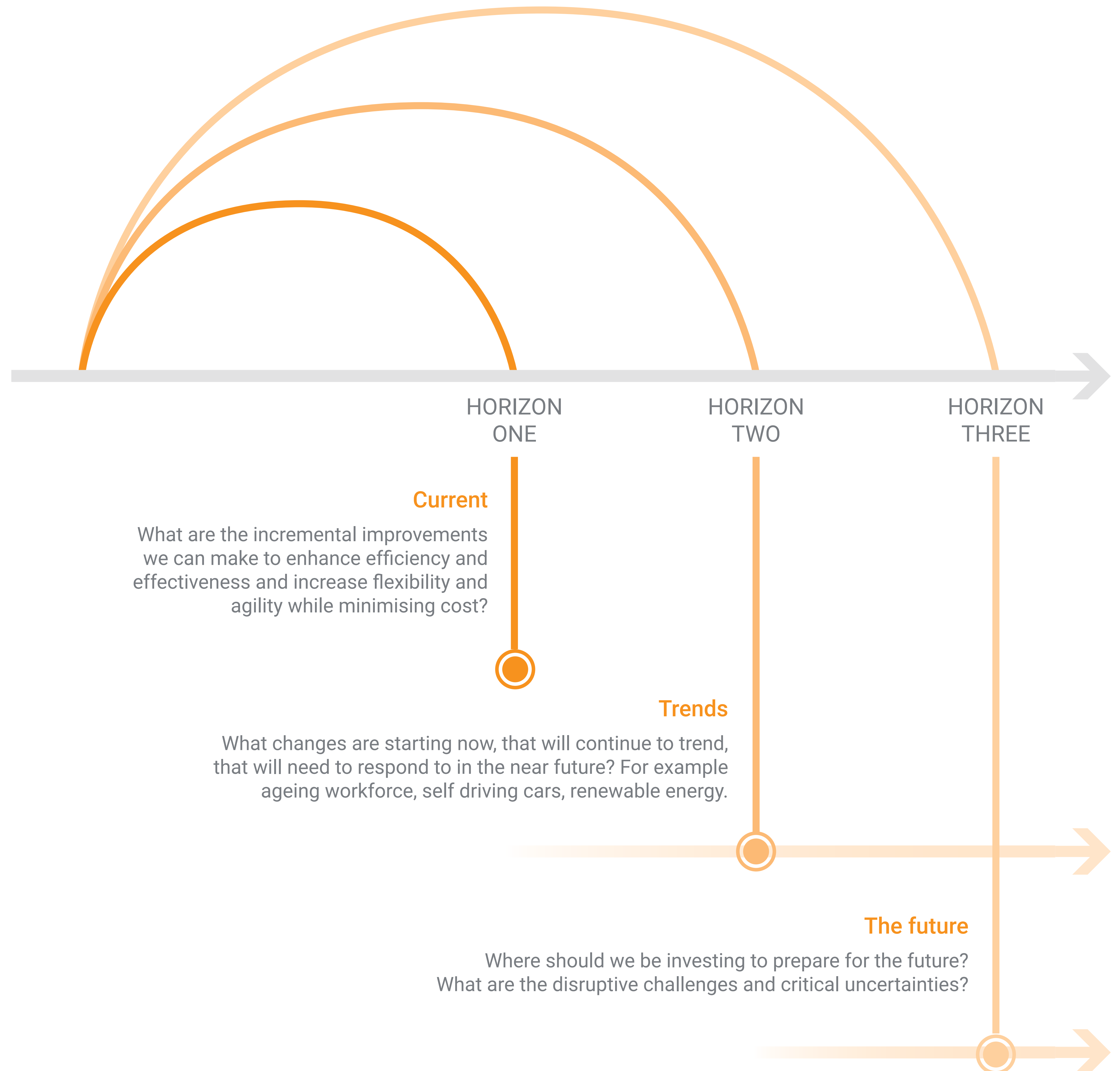No one experiences the whole system. People experience their own pathway through it.

Richard Buchanan

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## TIME

We look at three horizons of time to inform how we act today and how we plan strategically and responsibly for the future.

**HORIZON ONE**

**HORIZON TWO**

**HORIZON THREE**

### Current

What are the incremental improvements we can make to enhance efficiency and effectiveness and increase flexibility and agility while minimising cost?

### Trends

What changes are starting now, that will continue to trend, that will need to respond to in the near future? For example ageing workforce, self driving cars, renewable energy.

### The future

Where should we be investing to prepare for the future? What are the disruptive challenges and critical uncertainties?

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# ZOOM

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

## 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.
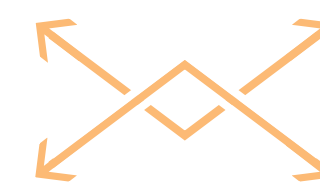
We observe at different fractals of zoom.
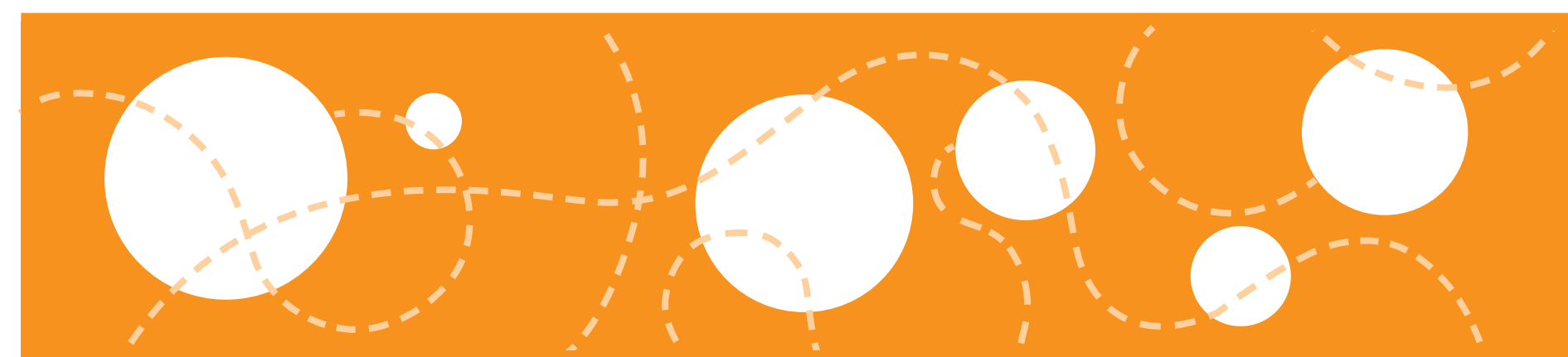
### Global systems

Geo-politics     Knowledge
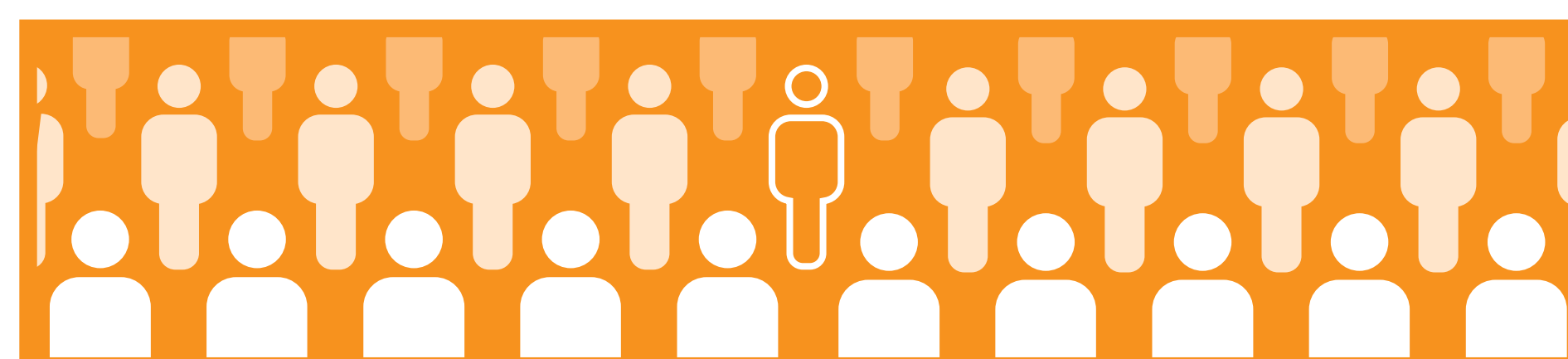Economy     Technology
Culture/society

### Human and natural ecosystems

The interaction between people and the environment
Environmental systems, social and cultural systems, economic systems

### Service systems

International, national, regional and local service systems

### Human experience

We make sense of a problem/opportunity in one system by looking at the experience pathway through many systems

### Interaction

Object and application design, technology, communication, artificial Intelligence

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## FORESIGHT

### Foresight is not the same as forecasting.

Foresighting allows you to consider disruptive forces that could change the future. You can imagine what could happen and test your strategy accordingly.

| Current | Alternative futures |
|---------|---------------------|

Understand the system megatrends

Identify the driving forces

Distil the critical uncertainties and underlying trends

Develop scenarios of potential futures

Use the scenarios to test planned actions

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# INSIGHT

An insight is a clear, deep, and sometimes sudden understanding of a problem or situation.

**Insights point to future opportunities.**

Why was this happening?

What has caused the current situation?

What are the further reaching effects?

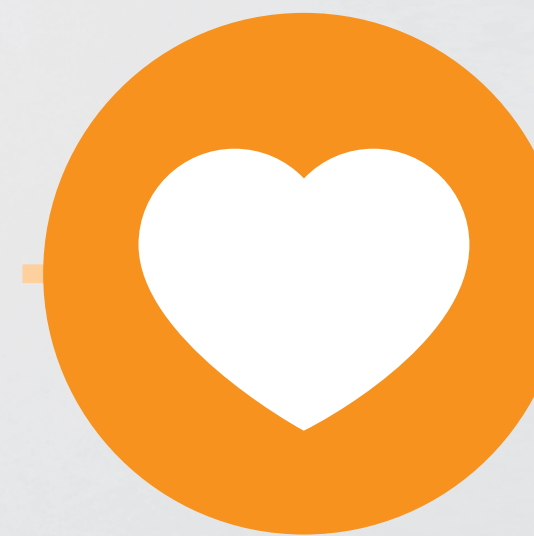What design questions does this raise?

BEHAVIOURS  INTERACTIONS  PERCEPTIONS  FEELINGS  THOUGHTS

# LEAD AND MANAGE DESIGN

### Design in complex systems requires leadership

It is authentic, genuinely seeking to achieve the optimal outcome for all parties. A good design is not a compromise but achieves an outcome that works for all.

### The designer brings nobility and humility

Nobility because they need confidence and conviction that they can tackle the world's most complex challenges. Humility because they must listen, change course, respect all voices, and be responsive.

### Design brings together 4 voices into a constructive collaboration – intent, experience, expertise and design

The designer brokers all voices, especially bringing the voice of the voiceless. They help everyone to reperceive the challenge and find new ways forward.

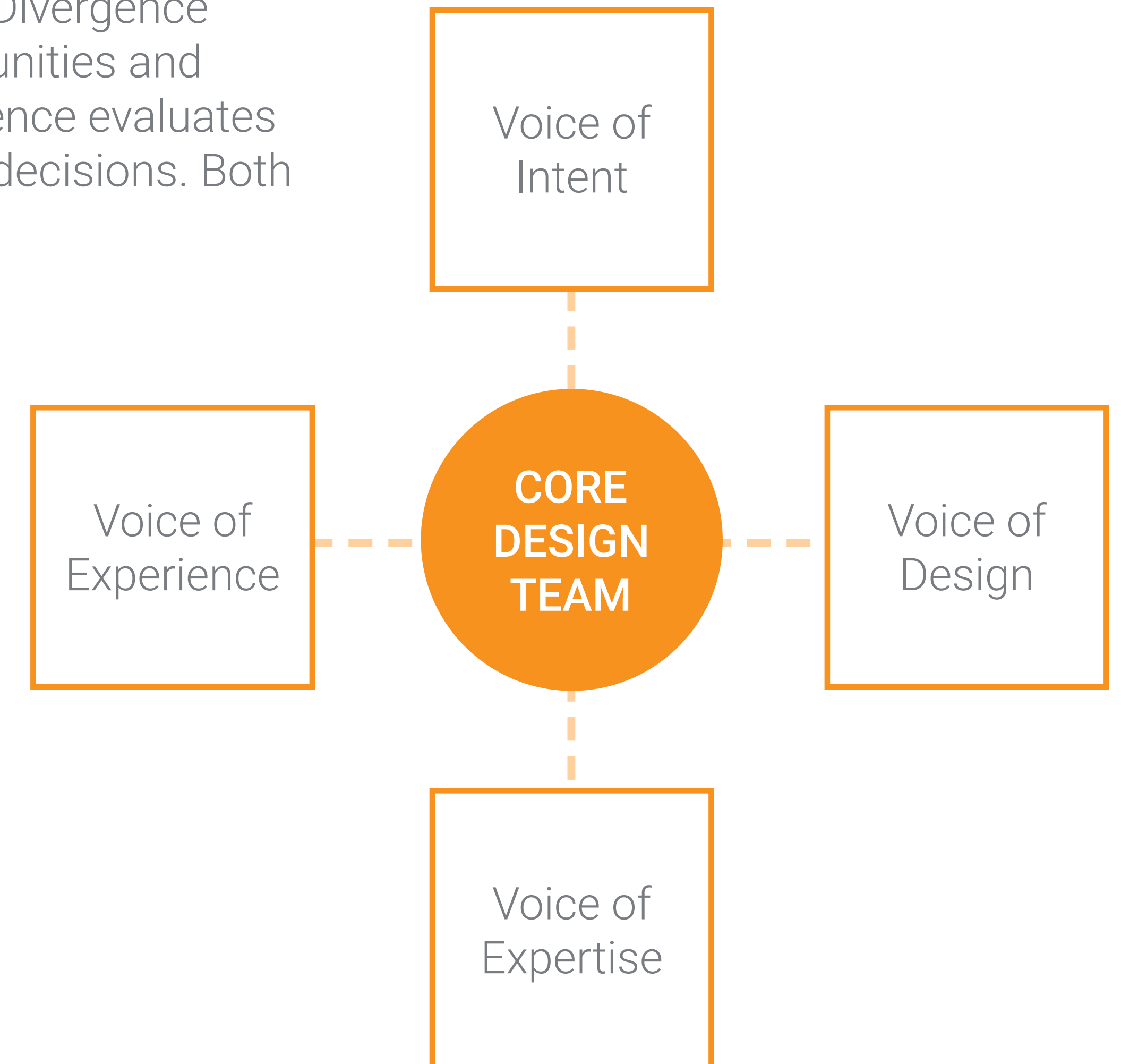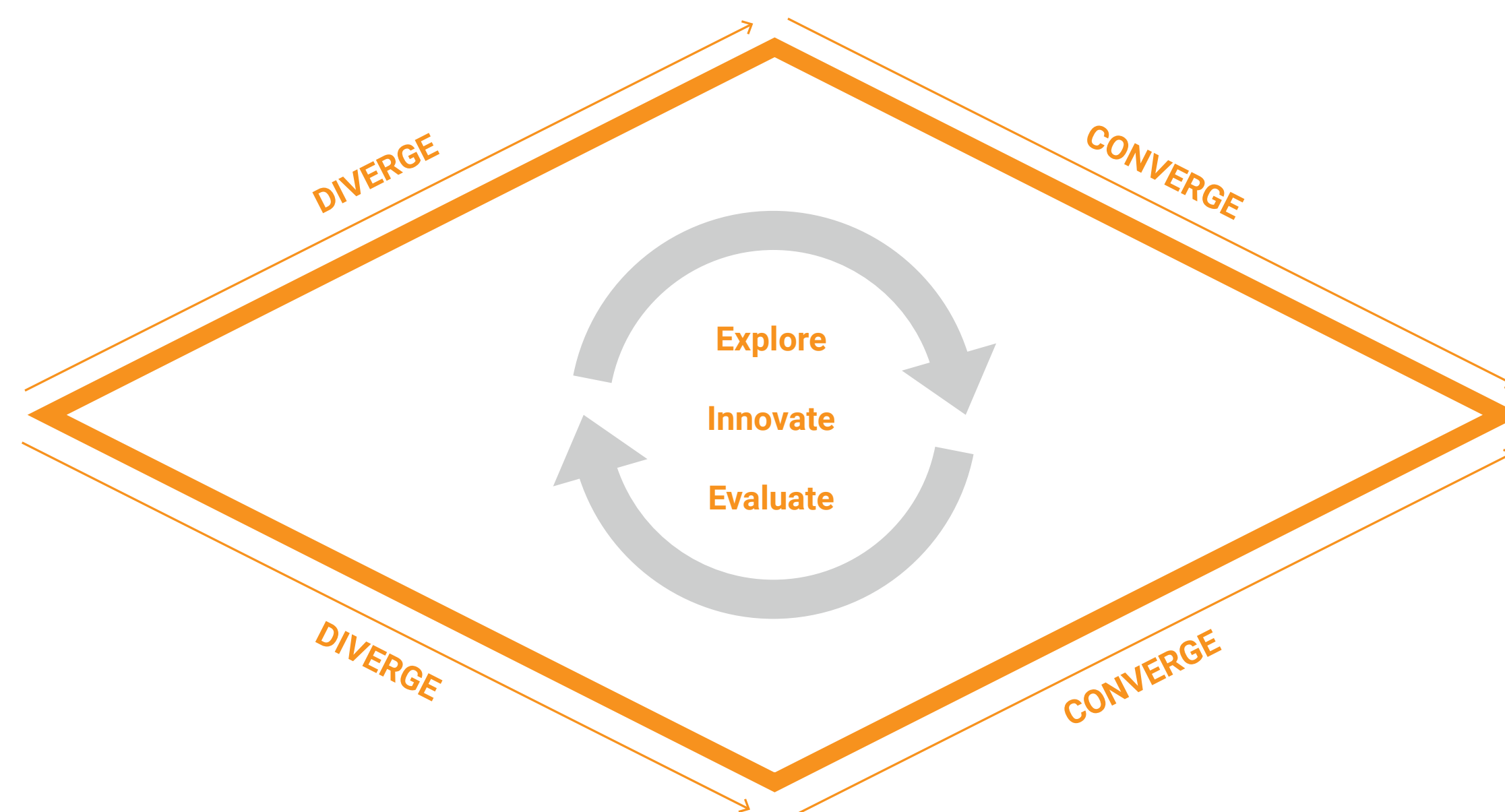## The designer is creating preferred futures therefore is optimistic.

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.

DIVERGE

CONVERGE

Explore

Innovate

Evaluate

DIVERGE

CONVERGE

Voice of Intent

Voice of Experience

CORE DESIGN TEAM

Voice of Design

Voice of Expertise

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## IMPACT AT SCALE

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

## Imagine.

Vibrant communities.

Strong economies.

Sustainable environments.

Trusted institutions.

**The complex system designer works with the dynamics of the system.** They:

- Appreciate the breadth of the ecosystem and its interdependent parts

- Identify critical uncertainties

- Recognise the ecosystem is dynamic, unpredictable and displays emergent properties

- Design changes that appreciate the ecosystem

- Amplify and leverage parts of the ecosystem that are naturally working well

- Identify and attenuate parts of the system working against the overall goals

- Identify a small number of high level indicators of impact and monitor them as close to real time as possible

- Constantly navigate towards the preferred future, scanning for unintended consequences
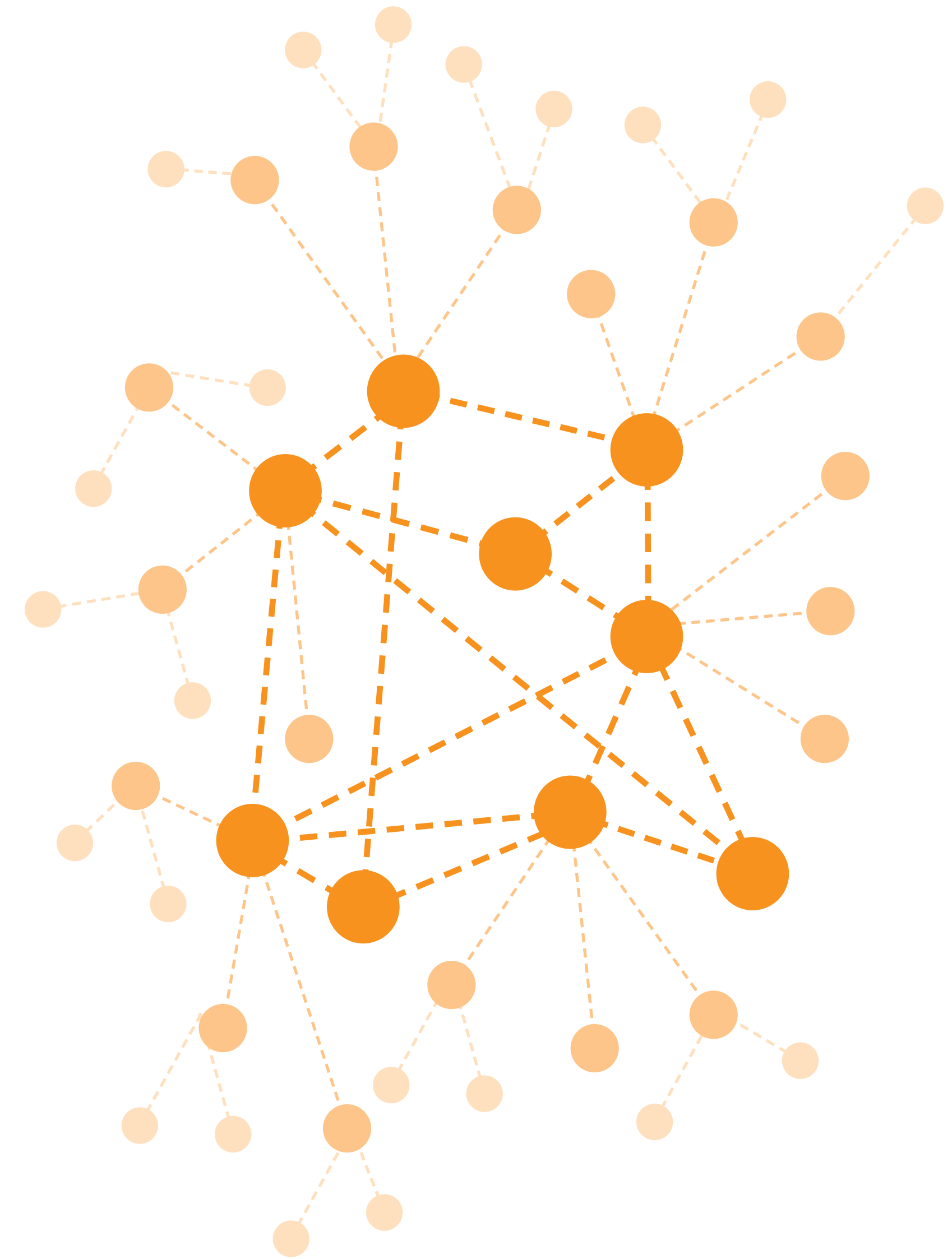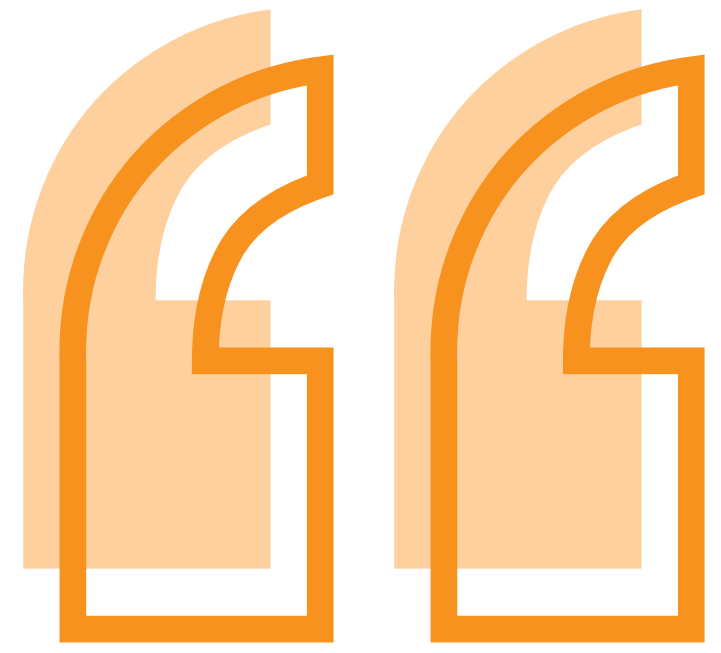
Everyone designs who devises a course of action aimed at changing an existing situation into a preferred one.

Herbert Simon