



UNIVERSITÀ
DEGLI STUDI
DI TERAMO



COMPUTER SCIENCE THEORIES AND TECHNOLOGIES

Design Thinking

Design of digital tools to solve real-life problems

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Introduction

“Design thinking is a human-centered approach to innovation that draws from the designer’s toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success.”

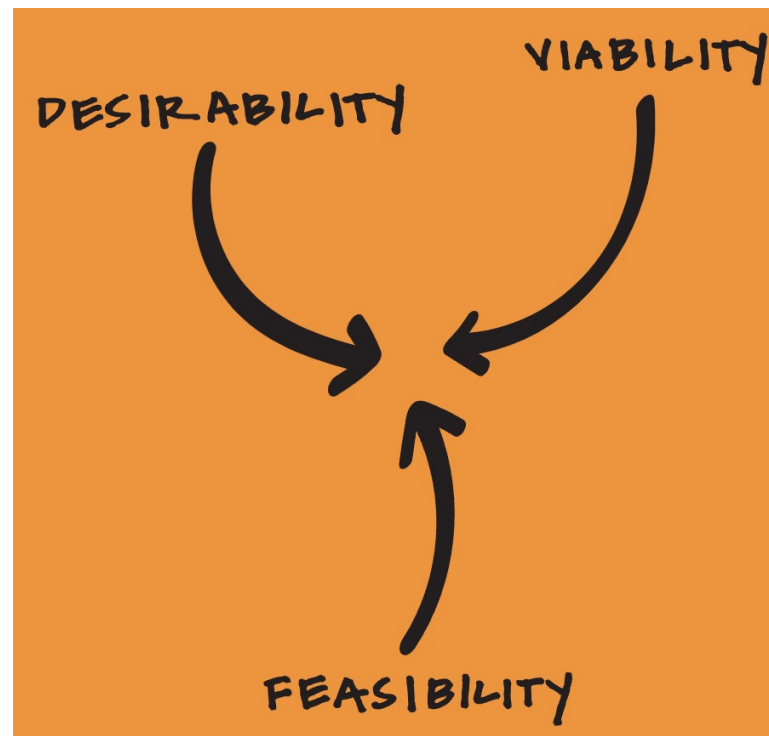
—TIM BROWN, EXECUTIVE CHAIR OF IDEO

- » Design thinking converts need into demand
- » It’s a human-centered approach to problem-solving that helps people and organizations become more innovative and creative

<https://designthinking.ideo.com/>

Introduction

- » Bringing together what is desirable from a human point of view with what is technologically feasible and economically viable



Tim Brown – TED Global 2009

Tim Brown

Design Thinking



https://www.ted.com/talks/tim_brown_designers_think_big?language=en



*«Design thinking is a human-centered design
non-linear, iterative process*

*that teams use to understand
users, challenge assumptions, redefine problems and
create innovative solutions
to prototype and test.»*

Tim Brown



Outline

- Design Thinking ...in context
- Design Thinking ...in numbers (...3, 4, and 5!)
- Design Thinking ...in process

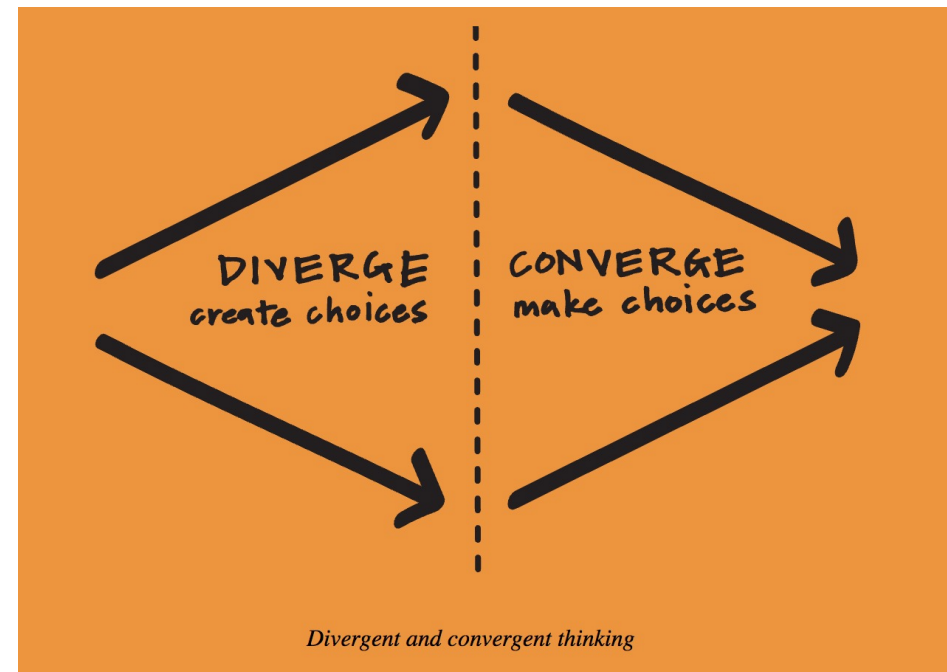
Design Thinking in context

We live and work in a world of interlocking systems, where many of the problems we face are dynamic, multifaceted, and inherently human. Think of some of the big questions being asked by businesses, government, educational and social organizations: How will we navigate the disruptive forces of the day, including technology and globalism? How will we grow and improve in response to rapid change? How can we effectively support individuals while simultaneously changing big systems?

Design thinking offers an approach for addressing these and other big questions.

Design Thinking in context

- There's **no single** definition for design thinking. It's an idea, a strategy, a method, and a way of seeing the world.
- It's grown beyond the confines of any individual person, organization or website. And as it matures, its history deepens and its impact evolves.
- Design thinking is a way to solve problems through creativity. Certainly, it isn't a fail-safe approach; nor is it the only approach.



**Convergent vs. divergent thinking:
Finding the right balance for creative
problem solving**

<https://asana.com/resources/convergent-vs-divergent>

Design Thinking in context

Design thinking's value as a world-improving, driving force in business (global heavyweights such as Google, Apple and Airbnb have wielded it to notable effect) matches its status as a popular subject at leading international universities. **With design thinking, teams have the freedom to generate ground-breaking solutions.** Using it, your team can get behind hard-to-access insights and apply a collection of hands-on methods to help find innovative answers.

Outline

- Design Thinking ...in context
- Design Thinking ...in numbers (...3, 4, and 5!)
- Design Thinking ...in process

3 Stages of Design Thinking Diagram

Inspiration, Ideation, Implementation



Inspiration Discovery

Write your text here...
Write your text here...
Write your text here...
Write your text here...

"Understand"



Idea Generation

Write your text here...
Write your text here...
Write your text here...
Write your text here...

"Create"



Implementation of solution

Write your text here...
Write your text here...
Write your text here...
Write your text here...

"Deliver"

4 Design Thinking PILLARS

- **Empathize** with people's needs,
- **Collaborate** with others across disciplines, skill sets, and perspectives,
- **Include** every idea in visible form for evaluation, and
- **Repeat, iterating and testing** solutions to perfect them, always with human needs at the center.



4 Design Thinking PILLARS



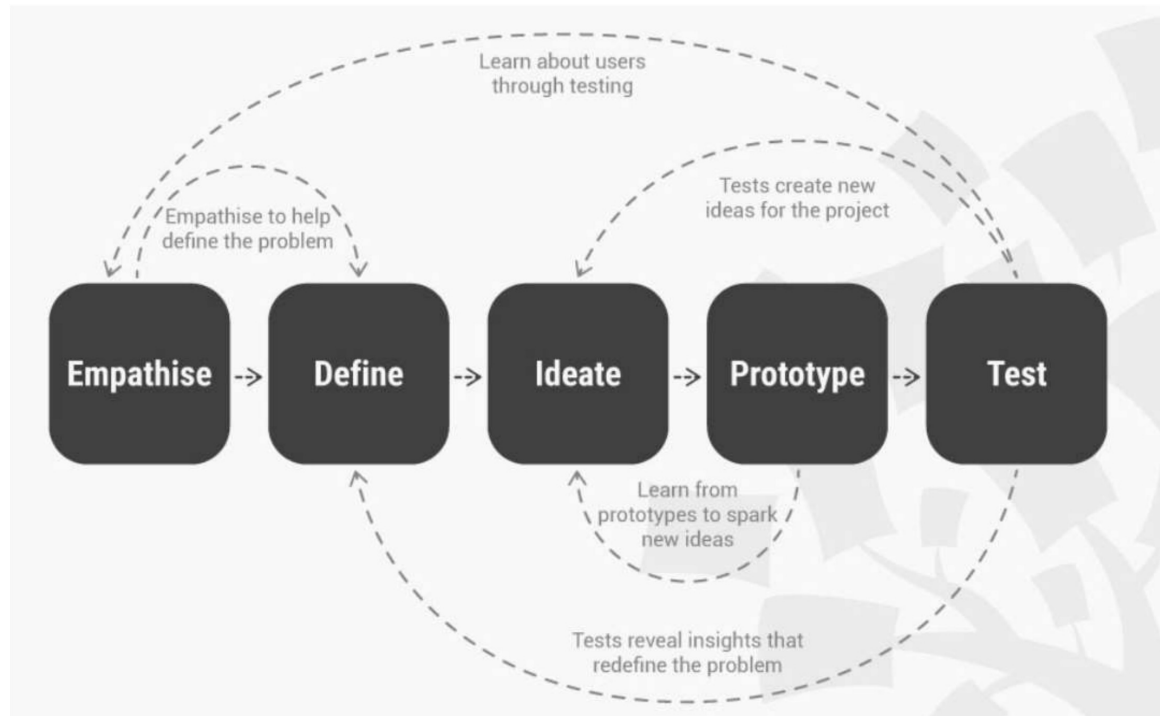
ITERATION



INCLUSION

<https://www.linkedin.com/pulse/diversity-inclusion-design-thinking-vibhavari-nagarhalli/>

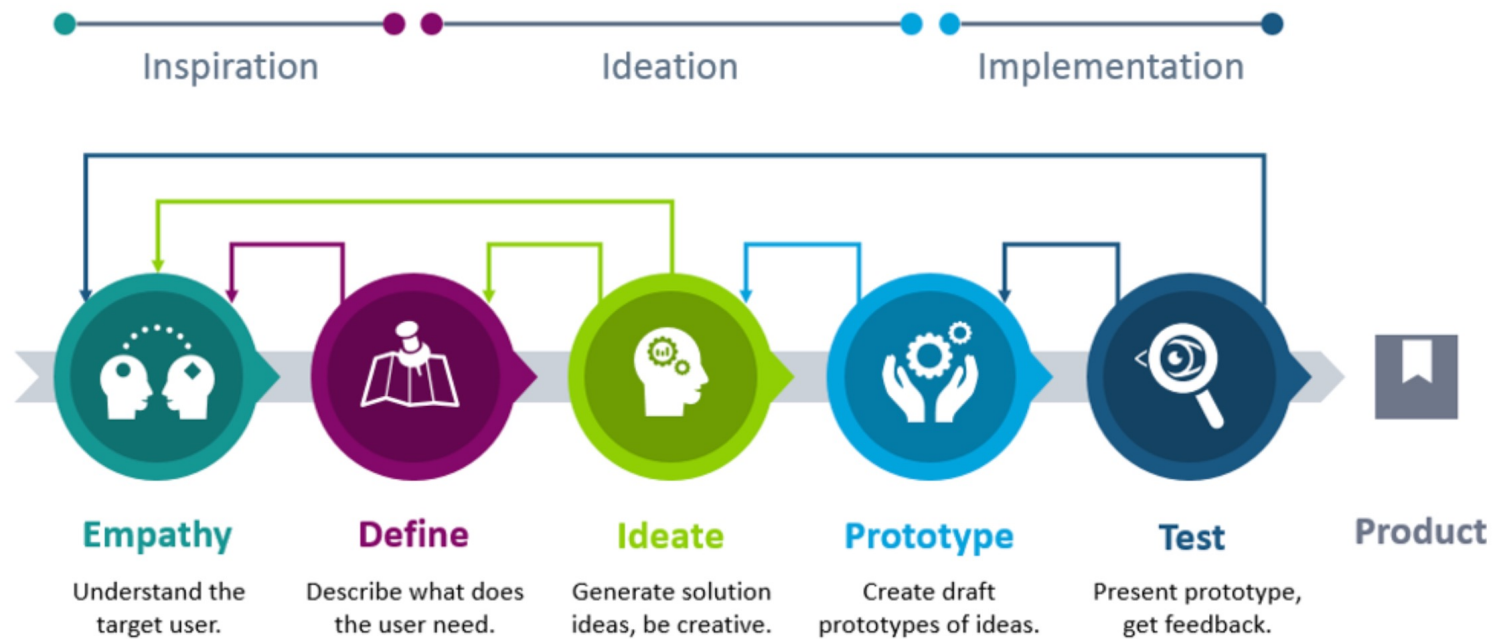
5 Action phases of Design Thinking PROCESS



<https://www.interaction-design.org/literature/article/stage-4-in-the-design-thinking-process-prototype>

5 Action Phases of Design Thinking Process

Empathy, Define, Ideate, Prototype, Test Product



Outline

- Design Thinking ...in context
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- Design Thinking ...in process

Key principles

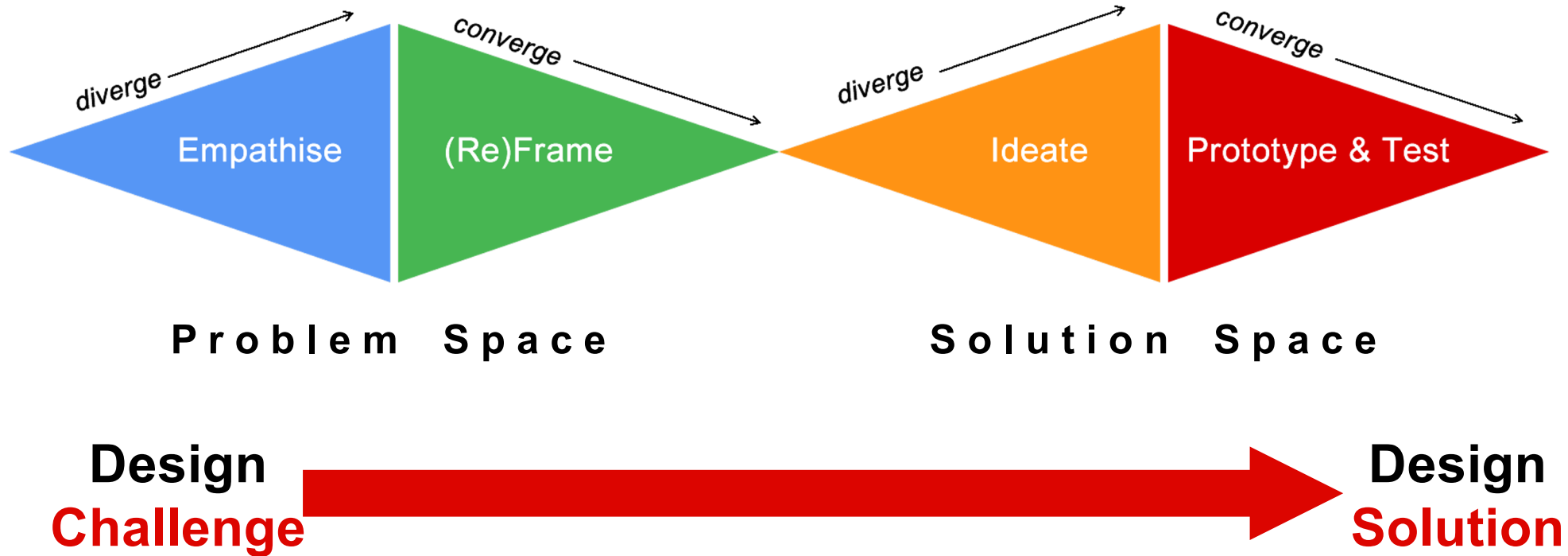
- **Human-centered** and based on deep empathy for the people at the center of the design effort.
- **Collaborative**. It is essential to get key stakeholders involved in the process of design.
- **Exploration and iteration**. Initial problem statements and solutions go through test-and-learn cycles. Prototypes are used to validate assumptions and ensure solutions meet people's needs.



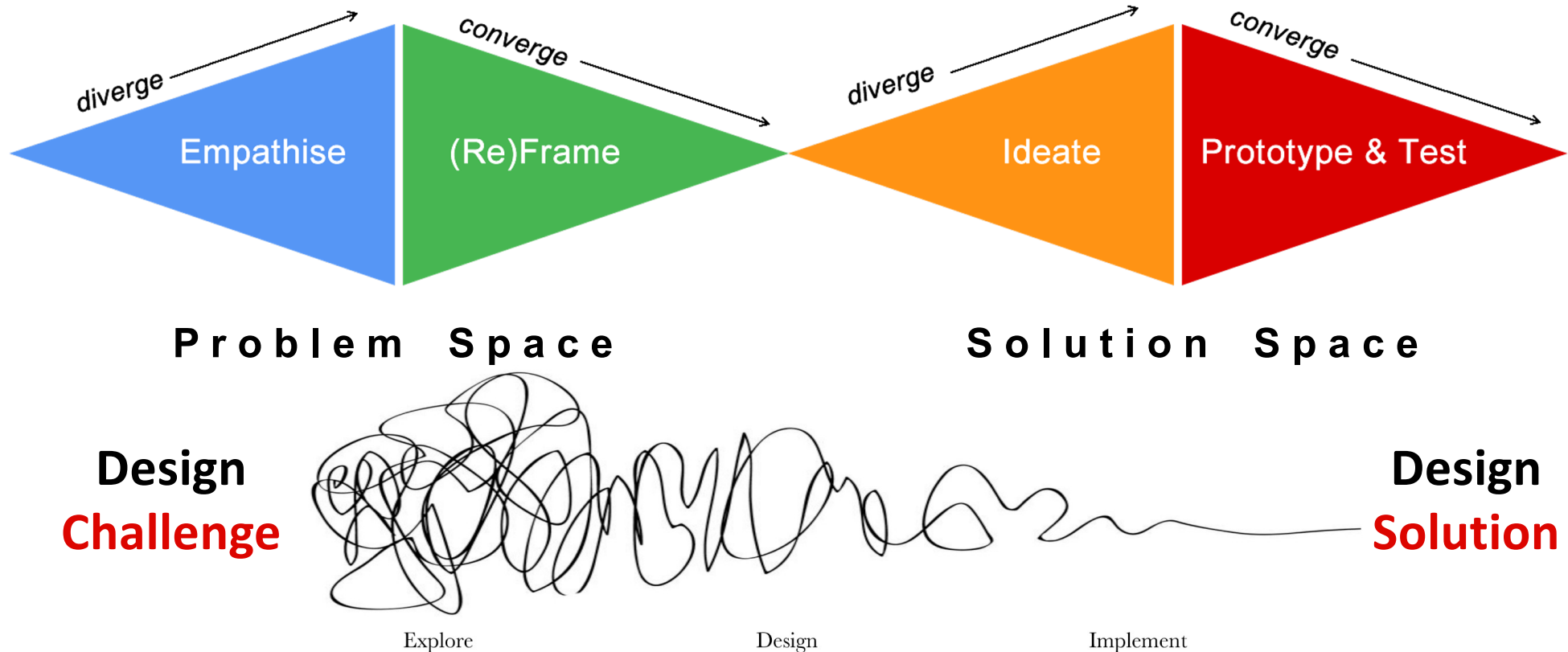
<https://www.designthinkersgroup.us/methodology/>

Computer Science Theories and Technologies – Pro.ssa Romina Eramo

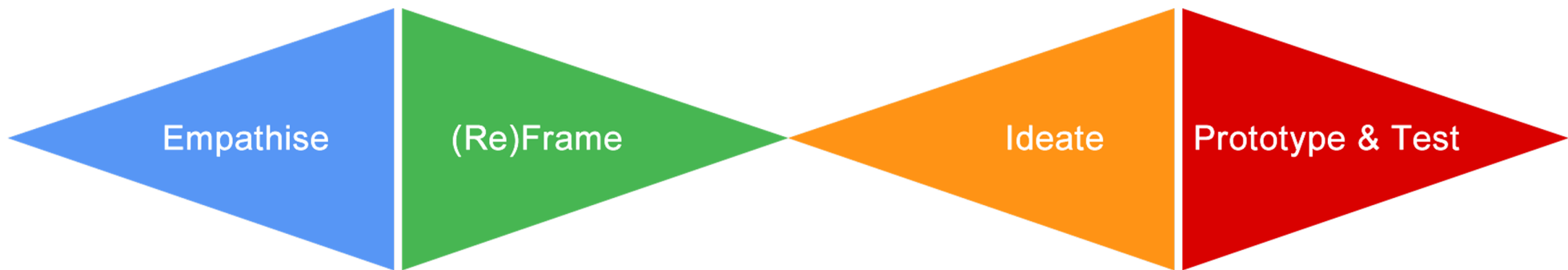
Design Thinking PROCESS



Design Thinking PROCESS

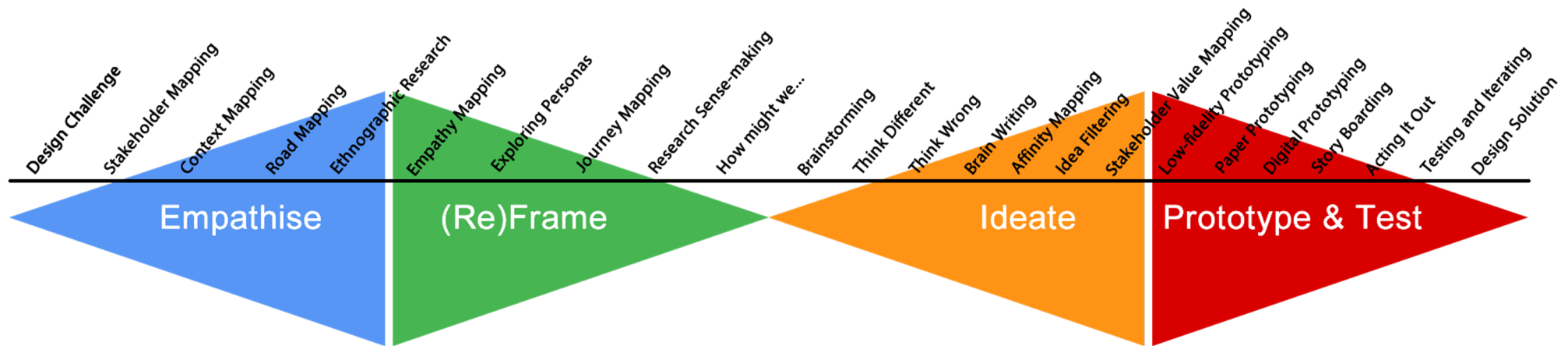


Design Thinking PROCESS by branding



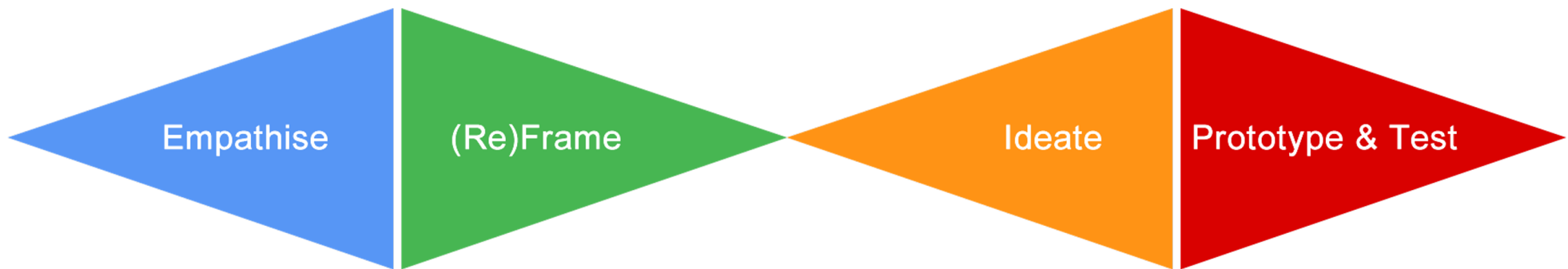
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|------------------------------|--|
| Design Thinkers Group | Empathize (Re)frame Ideate Prototype Test |
| Stanford d.school | Empathize Define Ideate Prototype Test |
| Ideo | Gather Generate Make Share |
| Ideo v2.0 | Inspiration Ideation Implementation |
| Luma Institute | Looking Understanding Making |
| IBM | Observe Reflect Make |
| FSU Innovation Hub | Empathize Ideate Build |

Design Thinking Process ...Methods and Tools

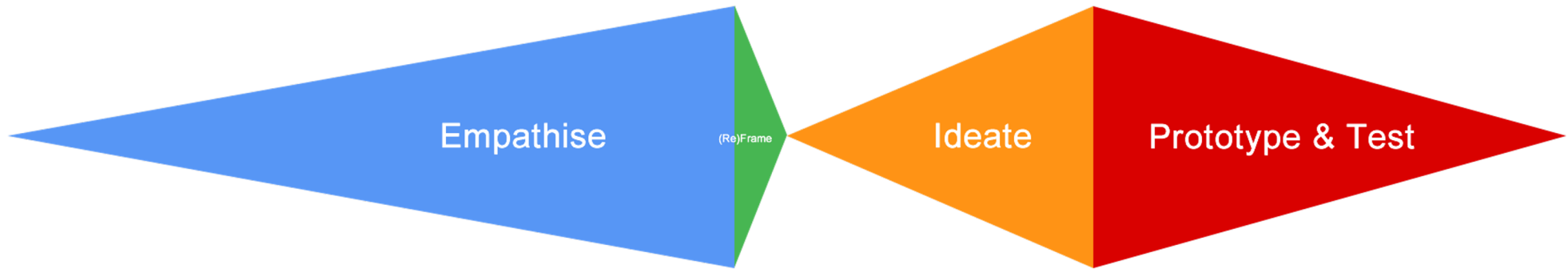


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Design Thinking Process ...in perspective



Design Thinking Process ...in perspective



Design Thinking Examples

- » AT Kingwood Trust UK
- » Burberry
- » Uber
- » Airbnb
- » Bank of America
- » Designing for the Homeless
- » Clean Team
- » Pillpack
- » IBM
- » Stanford Hospital
- » Netflix
- » NIKE

<https://u-next.com/blogs/design-innovation-strategy/design-thinking-examples/>

References

- » IDEO <https://designthinking.ideo.com/>
- » In 2009, IDEO designed and launched the HCD Toolkit. This book lays out how and why human-centred design can impact the social sector.



- » In 2015, Tim Brown (CEO of IDEO, pioneer of Design Thinking) reintroduces design thinking, the collaborative process by which the designer's sensibilities and methods are employed to match people's needs with what is technically feasible and a viable business strategy.

Acknowledge

Prof. Tania Di Mascio (University of L'Aquila)