

Design Thinking



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What is Design Thinking?

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- Design thinking is an approach that creatively and innovatively frames problems and generates solutions by engaging users and other key participants in the problem solving space.

Roots of Design Thinking?

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- School of Engineering, Stanford University
- Stanford D School
<http://dschool.stanford.edu/>
- IDEO, Palo Alto, CA
<http://www.ideo.com/>

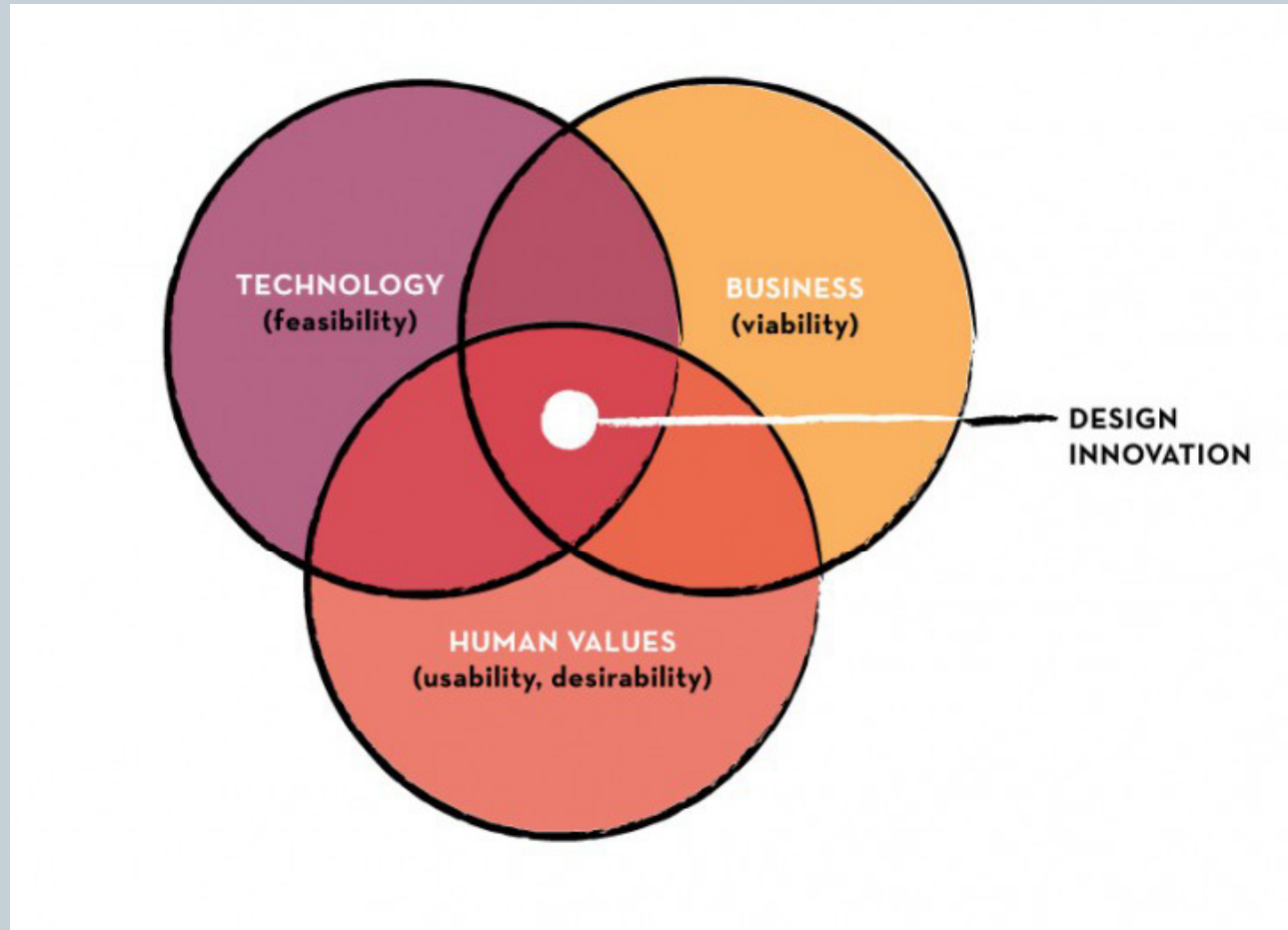
Core Idea of Design Thinking

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- Human-Centered Design:
 - To generate new ideas and innovative solutions that represent the convergence of what is *humanly desirable*, *technologically feasible*, and *economically viable*.

Sweet Spot of Design Thinking

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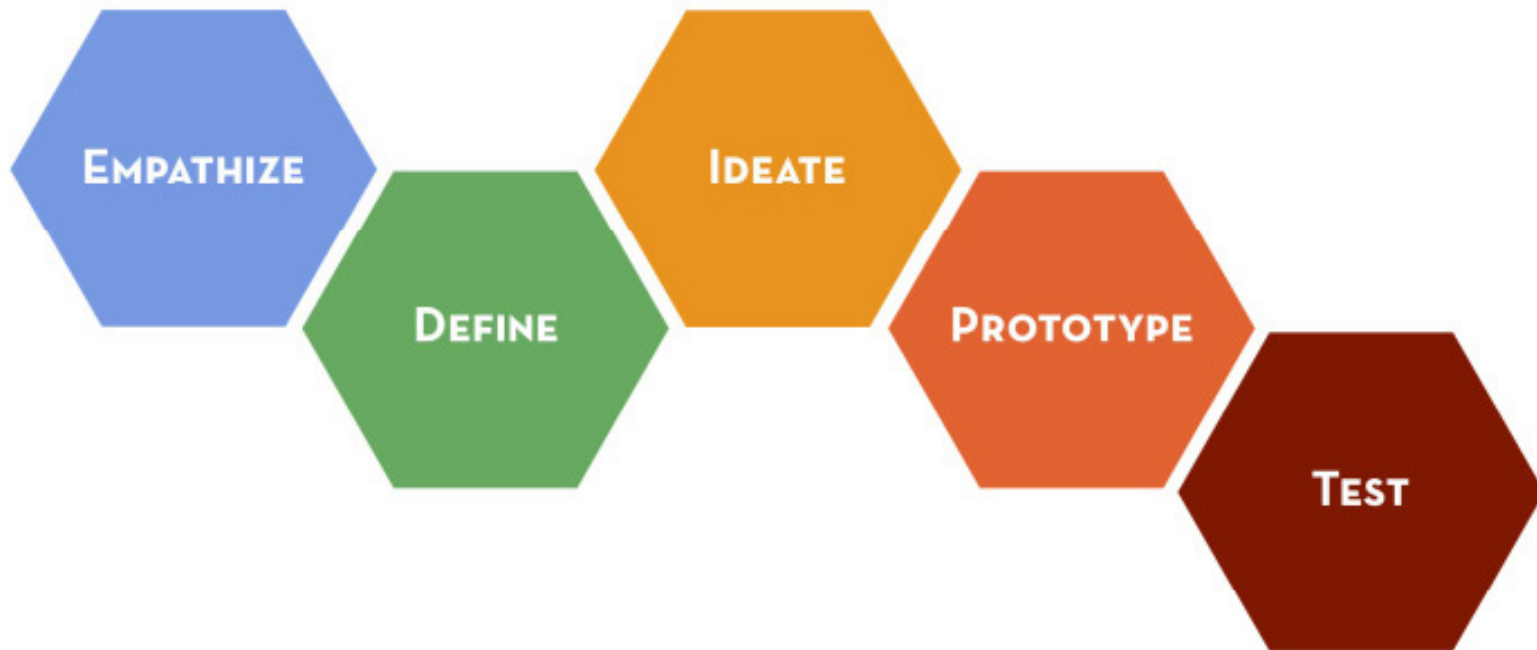
Key Aspect of Design Thinking

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- Collaborative, multidisciplinary teams.
- Depending on the design challenge, design teams can engage anthropologists, engineers, educators, doctors, lawyers, scientists, etc. in the innovative problem solving process.

Design Thinking Process

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NPS Design Thinking Faculty

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- Dr. Nancy Roberts, Graduate School of Operational and Information Sciences, (GSOIS), Department of Defense Analysis
- Dr. John Arquilla, Graduate School of Operational and Information Sciences, (GSOIS), Department of Defense Analysis
- Dr. Cliff Whitcomb, Graduate School of Engineering and Applied Sciences (GSEAS), Systems Engineering Department
- Dr. Frank Barrett, Graduate School of Business and Public Policy (GSBPP), Management Group.
- Dr. Peter Denning, Graduate School of Operational and Information Sciences, Computer Science Department.

Design Thinking at IDEO

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- Interview with David Kelley
 - <http://www.cbsnews.com/videos/how-to-design-breakthrough-inventions-50138327/>

The Design Thinking Process

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- Design Thinking begins with a design challenge:
 - How can we help the Army prepare for 2020?
 - How can we redesign the information flow in submarines?
 - How can we repair hospital incubators so premature babies have a better chance of living?

The Design Thinking Process

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- The example of the “incubator problem.”
- The Stanford multidisciplinary design team goes to Nepal and makes site visits to observe and collect data from users and experts on the design challenge.

The Design Thinking Process

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- Based on the data collected, the design team frames/reframes the design problem.
- You don't have an "incubator problem." You have "a keeping baby warm while traveling to the hospital problem."

Design Thinking Process

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- Having reframed the problem, the design team moves into ideation—what **new ideas** can we generate to address this “keeping baby warm problem”?
- One new idea: Envelop the baby in some material to keep it warm.

Design Thinking Process

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- **Prototyping:**
 - Drawing, sketching what “keeping baby warm” solutions might look like.
 - Creating simple models to anchor the team’s deliberations and explorations of alternative solutions.
 - Building physical objects for testing and feedback.

Embrace

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Advancing maternal and child health
by providing innovative solutions to the
world's most vulnerable populations

Embrace: Fits the Context

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Embrace

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- <http://abcnews.go.com/2020/video/change-tiniest-survivors-12428134?&clipId=12428134&playlistId=12428134>

Unique Features of Design Thinking

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- Unlike the traditional approach to design, design thinking does not start with the technology or a product or a service.
- Design thinking starts with the people who need the product, process, or service and innovates for them.
- Context is critical in the design thinking.

Unique Features of Design Thinking

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- Design specifications and requirements come from a “sponsor” who frames the design challenge.
- But design thinking draws on the creative and analytical talents of the design team to frame/reframe the design problem as needed.

Unique Features of Design Thinking

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- Design thinking involves ***embodied learning***—learning to “think with your hands.”
- Prototypes can be anything from a storyboard, to a role play, to an actual physical object.

Unique Features of Design Thinking

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- *Prototypes* of creative ideas are built as early as possible so the design team can learn just enough to generate useful feedback, determine an idea's strengths and weaknesses, and decide what new directions to pursue with more refined prototypes.

Unique Features of Design Thinking

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- The important point is to *learn by doing* by giving form to an idea, evaluating it against other ideas, and ultimately improving upon it.
- “*Fail early, fail often*” is the motto, so prototyping is “*quick, cheap, and dirty.*”

Unique Features of Design Thinking

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- *Designers need to work in open configurable spaces* with room to display visuals that chart the team's brainstorming, analysis, and problem solving processes.
- These spaces need to be *large enough to accommodate all the research materials, visuals, and prototypes* in order to keep them visible and accessible all of the time, not hidden away in files, drawers, and electronic folders.

Design Space

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- Stanford D School Space
 - <http://dschool.stanford.edu/fellowships/>

Redesign the Shopping Cart

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- <http://www.youtube.com/watch?v=taJOV-YCieI>

NPS Design Thinking Space & Contacts

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- King Hall Design Space –Dr. Nancy Roberts, Coordinator
- Library Design Space—Eleanor Uhlinger, Librarian
- Cebrowski Design Space—Sue Higgins, Coordinator

Goal of NPS Design Thinking Program

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- Make NPS the Center for Innovative Problem Solving for the Military.
- Engage students and faculty in interdisciplinary, creative, collaborative teams that use a design thinking approach to innovative problem solving.

Design Thinking Methods

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- <http://dschool.stanford.edu/use-our-methods/>