Principles of Design Thinking

Thinking Like a Designer
From Idea to Business
Design Thinking

An inclusive process that promotes user understanding and collaborative product development process to solve problems.

But, it wasn’t always like this as user feedback and participation was never an aim of the industrial revolution.
Design Thinking

Early 20th Century Household & Office equipment

Many consumer and commercial designs well into the 20th Century displayed **insufficient** consideration for user needs
Design Thinking

Early 20th Century Medical equipment

- Cancer treatment Coagulation machine
- Skull saw
- Phoropter (optical testing device)
Design Thinking

A deeply human process

A system of overlapping focus areas, not a sequence of orderly steps
Design Thinking

A user-centered approach that considers user-understanding & user experience as fundamental components for creating value.
Design Thinking

An integrated approach to problem solving
(All parts of the system equally important)

Rational & Analytical  +  Intuitive & Emotive
Design Thinking Process

**PROBLEM DEFINITION**
The right problem
A problem worth solving
Most important stage
- Design brief
- Problem definition
- Immersion
- Observation
- Suspension of judgment

**CREATION OF MANY OPTIONS**
Multiple perspectives yield richer results

**REFINEMENT SELECTION OF DIRECTIONS**
Idea-mapping and clustering for strategic consideration
- Repetitive process

**PICKING THE “WINNER” & EXECUTING**
Prototyping & Testing
A human-centered approach to innovation that draws from the designer's toolkit to integrate:

- People’s needs
- Technology possibilities
- Business requirements

Tim Brown, IDEO
3 Circle Product Ideation Model

**Innovation opportunities**
ideas related to specific user, market & technologies

- **Viability**
  Will it make money?

- **Feasibility**
  Can it be made?

- **Desirability**
  What are the needs of the user?

**People + Environment**

**Business**

**Market**

**Technology**
Selecting the Right Opportunities

Filters
- User + Environment
- Business + market
- Technology enablers

Ideas

Unfit opportunities (most ideas)

Relevant opportunities (few)

Product Commercialization
User Understanding (Profile)

What **questions** should be asked in the initial research?

- User characteristics/needs
- Environment characteristics
- Target market/business conditions
- Technology possibilities
- Competitive benchmarking

*Review questions on Simone Center website*
User Understanding (Profile)

Typical Questions

• Who is the intended user(s) for my product?
• What physical characteristics or other attributes best describe this person’s life?
• What are the activities this user is mostly involved with?

Methods

• Observations
• Interviews
• Data collection
• Documentation (illustrations, photography)

Goals

• To become familiar with the lifestyle and relevant environments of the intended user
• To identify and understand specific problems
• To identify and understand specific needs (explicit and latent)
Environment Understanding

Typical Questions

• What are the characteristics of the space the product is intended for (interior/exterior, commercial/residential)

Methods

• Personal visit to user’s environment
• Observation of condition and characteristics
• Observation of what users do in this space

• Interviews relating to the usage of the space:
  - Routine or special activities
  - What works well and not
  - Real needs and challenges
  - Wishes and desires

• Documentation (illustrations and photographs)

Goals

• To become familiar with the intended space the product will be operated in
• To identify environmental attributes that should be considered in the design of the product
Target Market/Business Understanding

Typical Questions

- What is the intended market for the product?
- What are the characteristics of this market?
- What other markets might also be interested in this product or its variations?

Methods

- Market research (multiple sources)
- Data collection
- Documentation

Goals

- To become familiar with the cohort and the market you are designing for, including their lifestyle and demographics
- To identify specific challenges associated with this market
- To identify specific needs or wants essential for business success (explicit and latent)
Technology Understanding

Typical Questions
• What are the most important technologies that should be considered to enable the product to function
• What are their most important characteristic, benefits and downsides
• How easy/difficult it would be to acquire the technologies of interest?

Methods
• Research and data collection based on the product’s functional needs

Goals
• To ensure functional specifications and estimated product cost are understood
• To ensure the design can be manufactured to perform as intended
• To identify challenges that might prevent a timely development (such as developing new technologies)
Competitive Benchmarking

Method: Evaluate & Compare

• Select a few consumer products from a similar product category made by different makers

• Analyze your selected products based on specific categories / questions (see previous page)

<table>
<thead>
<tr>
<th>CATEGORIES / QUESTIONS</th>
<th>PRODUCT 1</th>
<th>PRODUCT 2</th>
<th>PRODUCT 3</th>
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<tbody>
<tr>
<td>Target market</td>
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<td>Environment</td>
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Industrial Design/User Experience

Key product functions:

- **Practical**: Product task, what it does
- **Aesthetic**: Environmental fit
- **Emotive**: Communication with the user

*Every product has all of these functions, whether they are intentionally designed or not.*
Industrial design: 
*User-centered* process for mass production

Better user experience + Improved human conditions
Please use the following guidelines for your IdeaLab presentation:
IdeaLab Spring 2017

- Problem area original title
- Problem area new title (if different)
- Problem statement (definition)
- Team members information:
  - Full name
  - College/department
  - Year at RIT
  - Email contact
- Team advisor (RRH client)
  - Name + email contact
- Team coach (RIT faculty)
  - Name + email contact

1st page of presentation should include this information

One image of your final concept design
Follow this simplified Design Thinking process to research, organize and present your concept solution.

Use as many pages as necessary

Content Requirement (each team)

- User characteristics/needs (profile)
- Environment characteristics
- Target market/business conditions
- Technology possibilities
- Competitive benchmarking
- Ideation – new concept development (2D + 3D sketches/models, CAD)
- Experimental models/prototypes (images)
- Documentation/presentation (PowerPoint)