Bridging the Gap Between Concept and Manufacturing

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Industrial Design

Class summary

When the concept itself or the concept designer cannot convey the idea or design to the engineer or manufacturing, it becomes the industrial designer's job to walk the line between concept and engineering in order to convey the challenging concept to engineering and manufacturing. This class will not only explore personal experiences of a professional industrial designer working between concept and manufacturing, but will also identify key workflows or processes of how the industrial designer can communicate design concepts more effectively through communication techniques with engineering and manufacturing. This class is for anyone who would like to learn or have an understanding of the workflow and thought process of the industrial design industry and learn class-explained techniques and workflows to communicate concept and designs to others.

Key learning objectives

At the end of this class, you will be able to:

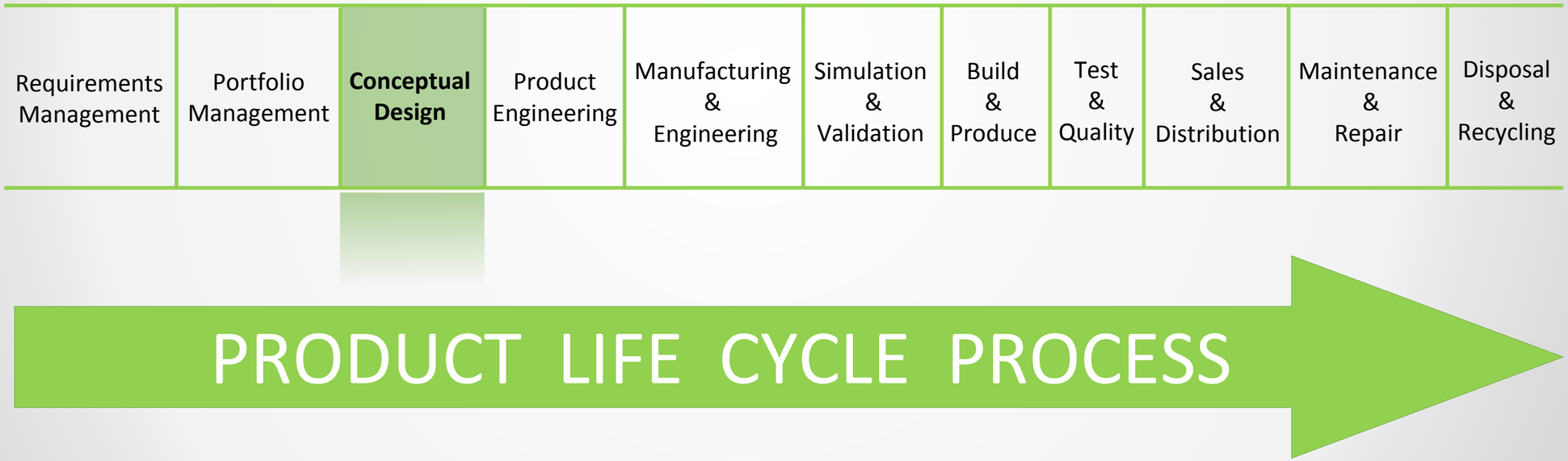
- Discover the industrial designer's deliverables.
- Discover user scenarios and examples for group discussion and comment.
- Learn techniques and workflows which the industrial designer can use to communicate with engineering and manufacturing.
- Learn how current creative and CAD software are integrated within the design processes.

Key learning objectives

Industrial Designer:

- An Industrial Designer is most noted for their creative ideas, sketches, styling and prototype models in their respected industry. Their deliverables contain everything from research data to working prototypes, from sketches to CAD models, help developing processes to reverse engineering. These deliverables all depend on a company's needs or situation to how an Industrial Designer is placed.

Where does the Industrial Designer fit in the Typical Design and Manufacturing Process



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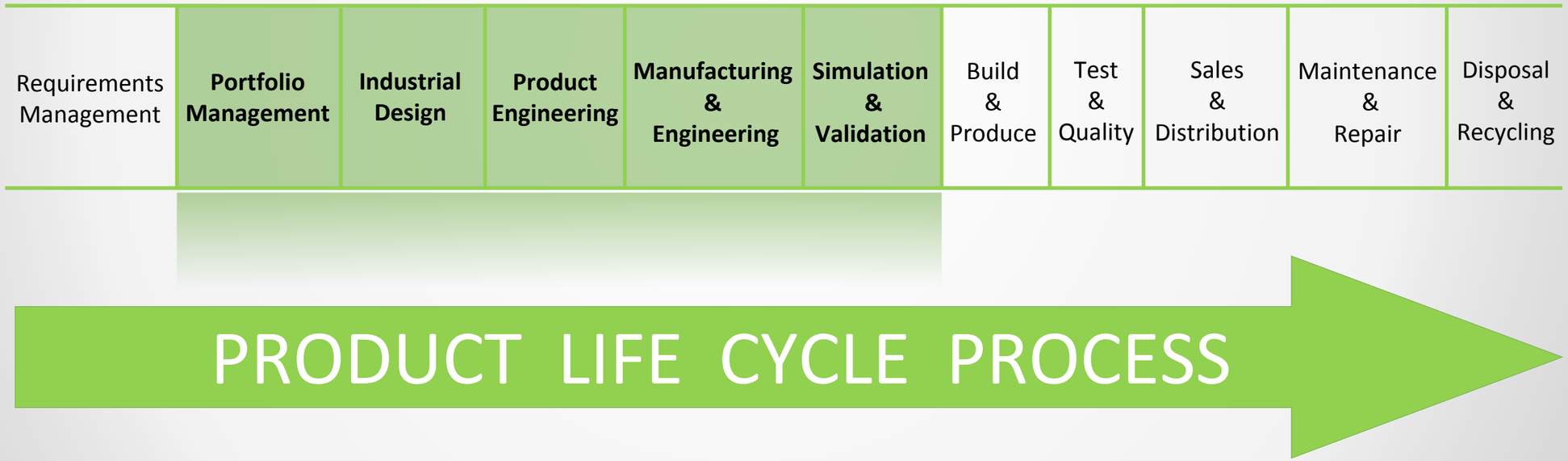
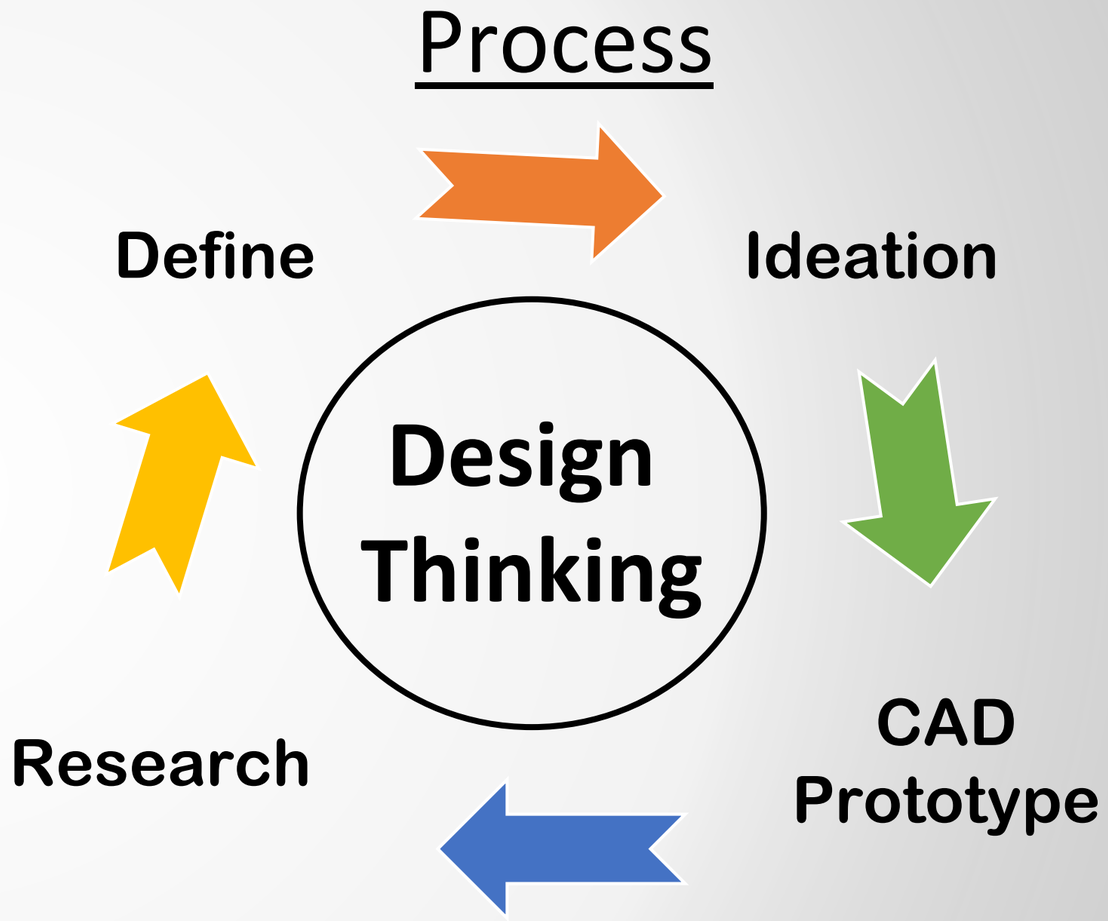


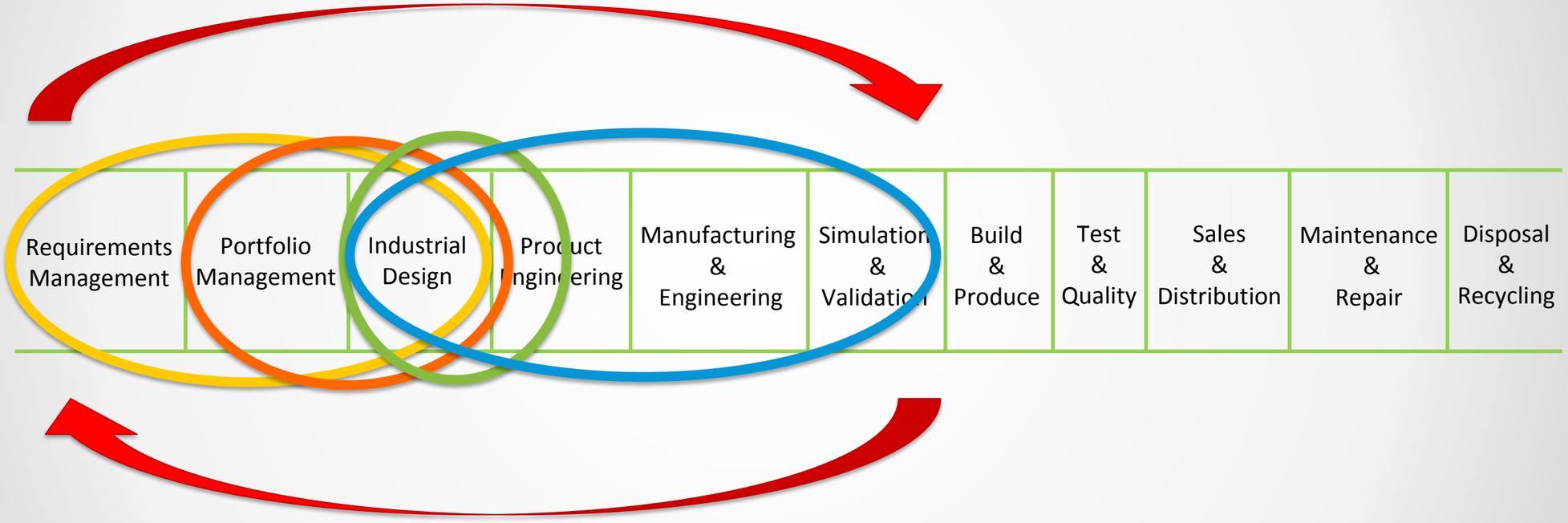
Design Thinking

The Industrial Designer follows a process, not a linear process, more of a circular process, known currently as the Design Thinking process. This process anticipates obstacles which then allows the product to recycle through the process eliminating as many issues possible that might occur in manufacturing, final production and consumer use.

Using the Design Thinking process or methodology, empowers people to be innovative and collaborative in solving problems.

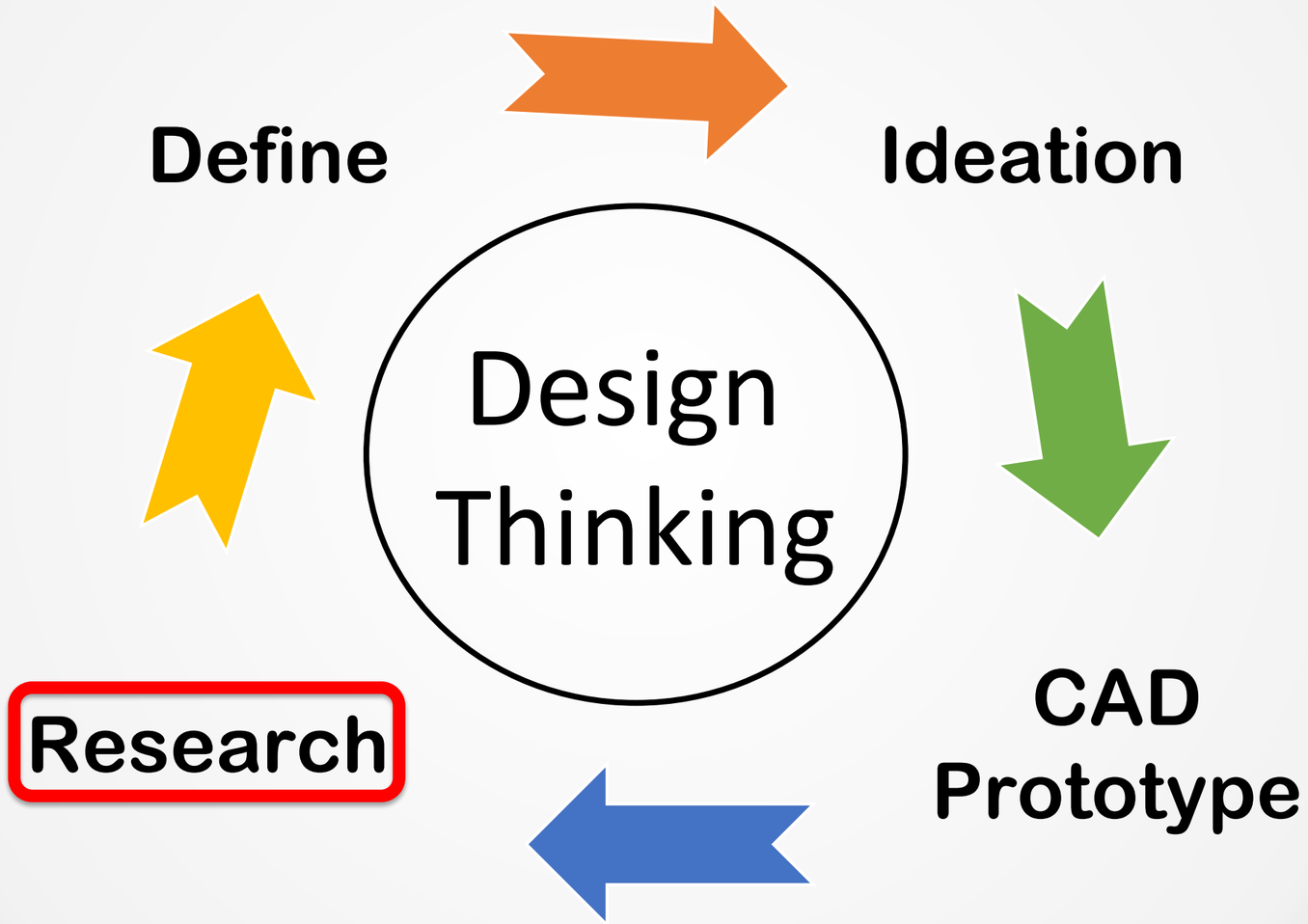


Where does the Design Thinking Process fit in the Typical Design and Manufacturing Process



PRODUCT LIFE CYCLE PROCESS

Process



Research

Field Study

Observations

Investigate

Research

Ask questions

Interview End Users

Ask about perspectives

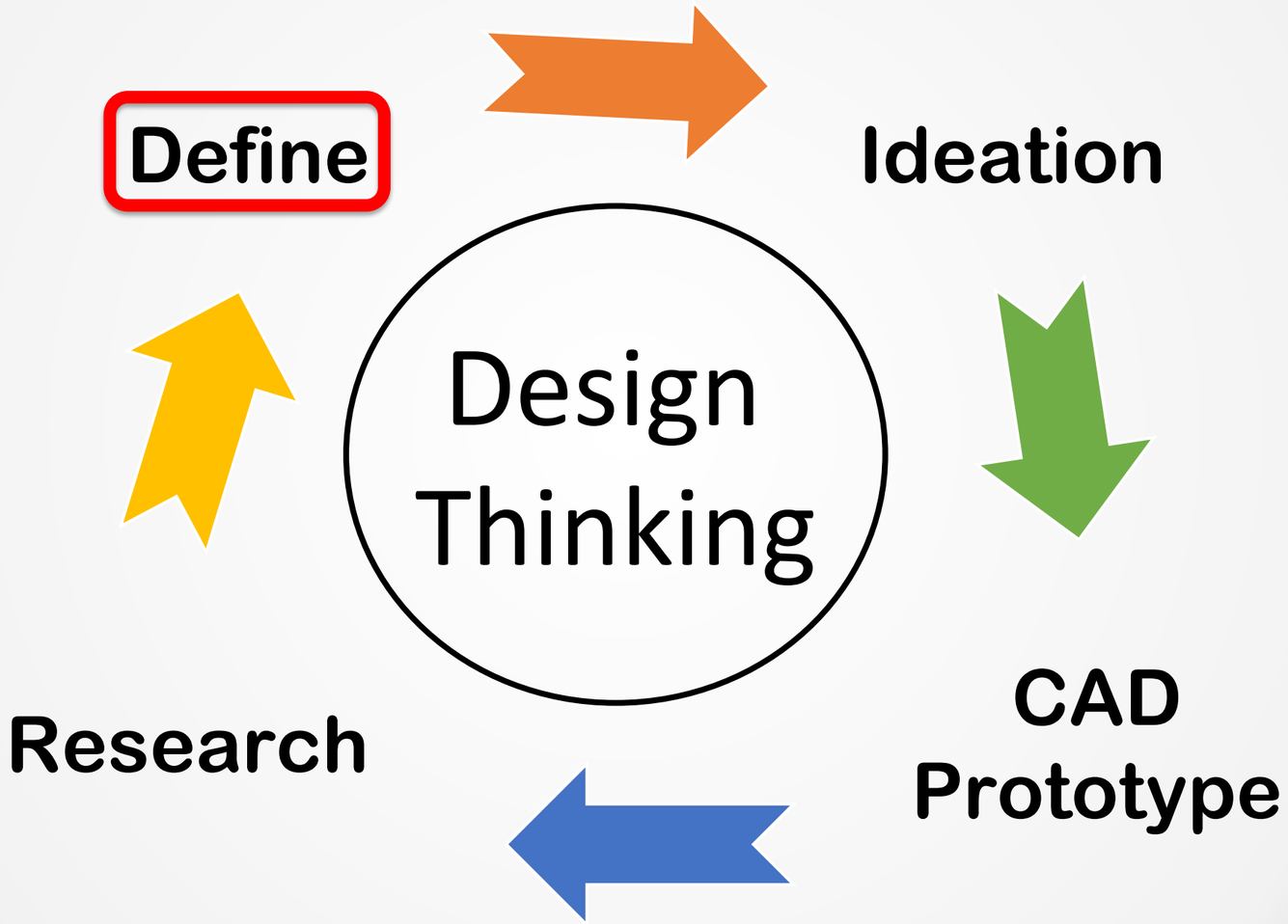
Record Actions and Behavior

Feelings relating to End User’s actions

Record all information for later use

Compare similar products

Process



Define

Timelines

Review Researched Information

Comparing Competitor Parts

Benchmarking

Reverse Engineering

Reference Data

Define

Re-Define

Explore New Ideas

Create New Approach

Data from research can be interpreted as trending data.

Define

Looking at data with a different perspective at this phase, in a 1945 creative experiment by Gestalt psychologist Karl Duncker, called Duncker's Candle Problem, tested participants with the following task: affix and light a candle on a cork board wall so the candle wax won't drip onto a table or floor below. To do so, one may only use the following along with the candle; a book of matches and a box of thumbtacks.

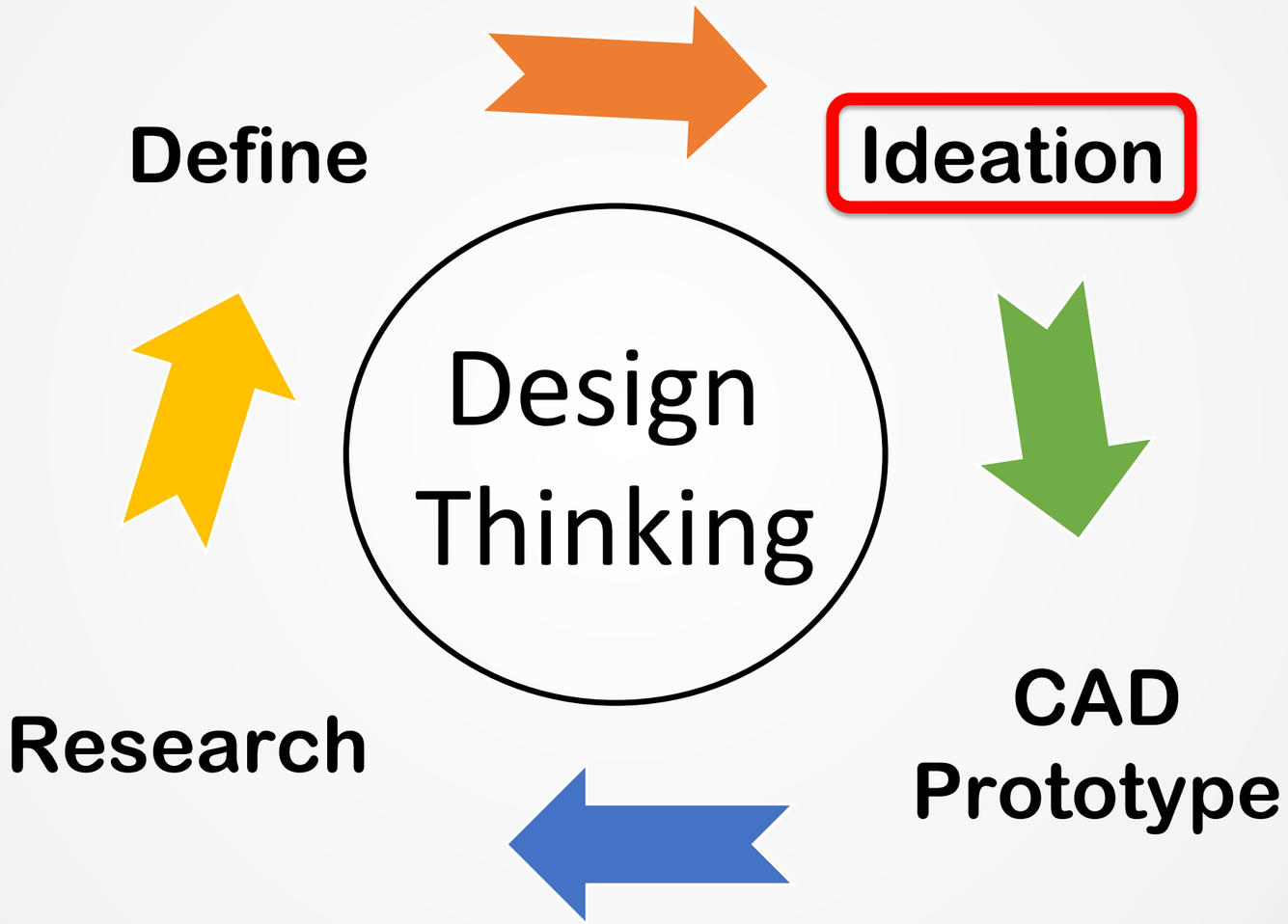
Many of the people who attempted the test explored other creative, but less efficient, methods to achieve the goal. For example, some tried:

Tack the candle to the wall using thumbtacks.

Melt some of the candle's wax and use it as an adhesive to stick the candle to the wall.

Neither method worked. However, if the task is presented with the tacks piled next to the box (rather than inside it), virtually all of the participants were shown to achieve the optimal solution, which is self-defined.

Process



Ideation

Collaboration

Brainstorming

Sketching

Ideation

Brainstorm : Basic Technique

- Facilitator
- Keep On Task
- Invite Diverse Group of People
- Structure the Brainstorm
- Prepare the group to start thinking creatively.

Ideation

Brainstorm : Basic Technique

Use Note Cards to Write Down/Sketch Ideas

Share and Explain Ideas on Board

Organize Ideas to:

- -Categories
- -Rankings
- -Columns

Ideation

Brainstorm : Basic Technique

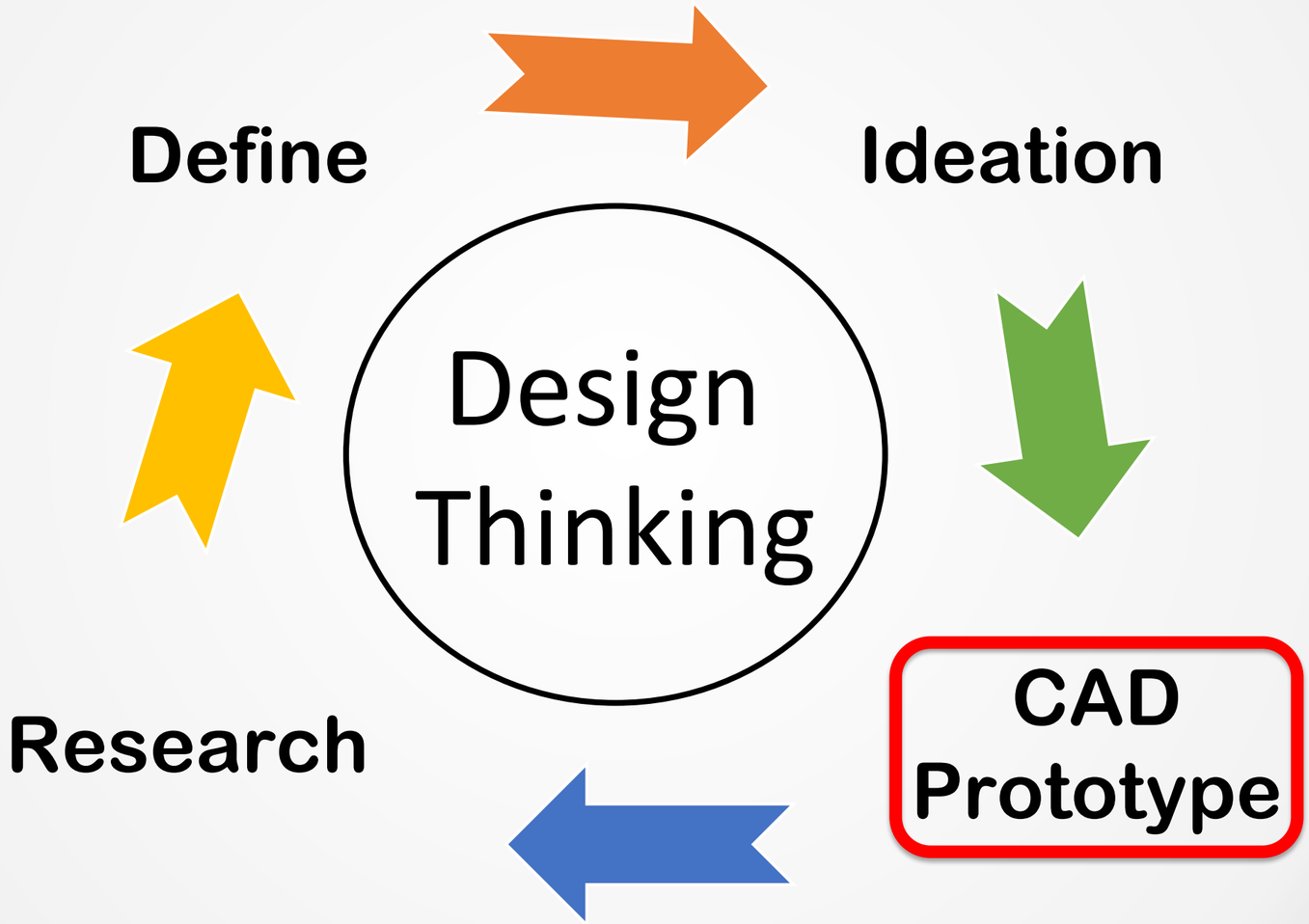
Decide to Keep or Remove Ideas

Record all Data from Brainstorm

Have Ideas Flushed Out

Follow Up Meeting with
Flushed Out Ideas

Process



CAD Prototype

Prototypes can come in many different forms

3D CAD Models

- Aesthetics
- Volume
- Weight
- Dimensions
- Assemblies
- Analysis Testing

CAD Prototype

3D Printed Models

SLA Stereolithography

- Surface Issues
- Design Functions
- Ergonomics
- Human Factors

Questions ?

MY TRAINING. MY SKILLS. MY TIME.

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