AUTODESK **UNIVERSITY** 2015

CP11709

Bridging the Gap between Concept and Manufacturing

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Learning Objectives

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

Description

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.

Your AU Experts

Designing and drawing has always been Eric Bansen's true career passion, but he has found himself working for a variety of companies generating, developing, and communicating new product and automotive design products, from concept through production. Eric has found that this diversification of design work has challenged him through the learning of new technologies, processes, and problem-solving techniques in the design industry. Currently based in Novi, Michigan, Eric works as a technical CAD consultant for i GET IT Online Training for Engineers from Tata Technologies, focusing on online e-training for engineers and designers alike. Eric has created numerous online training courses for i GET IT in both text and video format.

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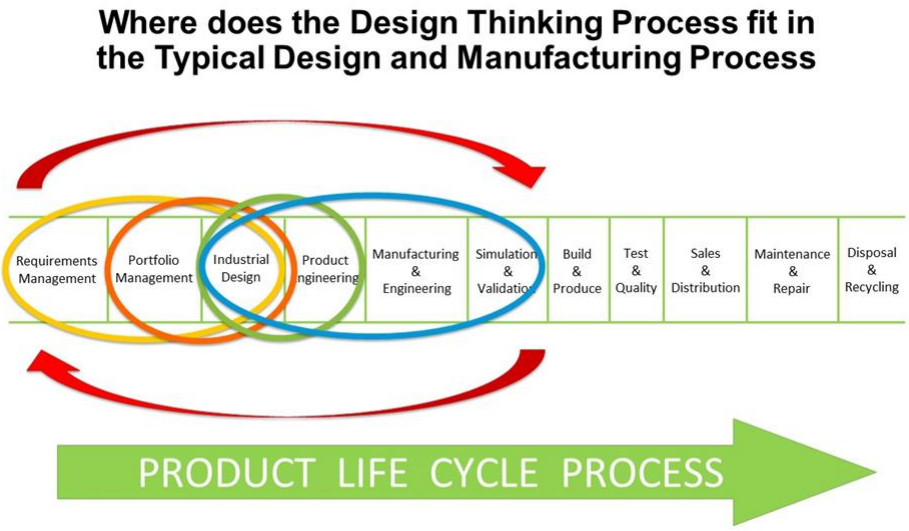
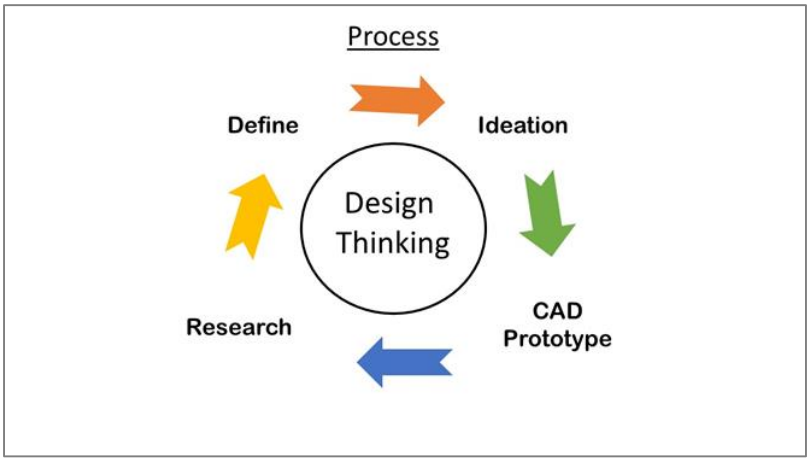
Techniques and design workflows in which the Industrial Designer can use to communicate with engineering and manufacturing

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. Using the Design Thinking process or methodology, empowers people to be innovative and collaborative in solving problems. 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. Four basic phases in the Design Thinking process Research, Define, Ideate and Prototype that I have been a part of, used, integrated in personal projects and experienced throughout my career.





Research

In the Research phase it all starts out in the field, asking questions to the end user and knowing their feelings and thoughts on what they think could fix or improve on a product's problem. Being sure to closely observe the end user using the product and how they work with the product's problem in question. Recording their behavior when they use the product and how it makes them feel. Investigate the scope of other similar products and how they compare to your products problem. See if a solution is addressed in the other products, thus getting you to a quicker solution.

Three important areas of Research:

Field Study

Observations

Investigate

Research Bullet Points:

- Ask questions
- Interview End Users
- Ask about perspectives
- Record Actions and Behavior
- Feelings relating to End User's actions
- Compare similar products
- Feelings relating to End User's actions
- Record all information for later use

Define

In the Define phase you organize and develop a deeper understanding of the information gathered. This phase is where you create a comprehensive presentation of the research that can be used as reference. After going through the research information this phase will allow you the opportunity to ask questions against the research allowing you the opportunity to re-define the problem and re-direct your approach, if needed. With a re-direct, you can go back to explore new ideas that could help you find a solution to your problem faster.

Define Bullet Points:

- Timelines
- Review Researched Information
- Comparing Competitor Parts
- Benchmarking
- Reverse Engineering
- Reference Data
- Re-Define
- Explore New Ideas
- Create New Approach

Ideation

In the Ideation phase there are no bad ideas. Be open to many possibilities to get to the good ones. One technique is to have brainstorm meetings. In these meetings invite a diverse group of people from different departments to help widen the scope of ideas. Organize and record the ideas and then sketch them out. Making the ideas visual in sketch format helps to flush out and clarify the idea to see how feasible it may be. Create another meeting and collaborate over the sketched ideas with another diverse group. Filter through the sketches and narrow the scope to just a few ideas to help bring a solution to your problem.

Three Important Areas of Ideation:

Collaboration

Brainstorming

Sketching

Brainstorming Techniques Bullet Points:

- Facilitator
- Keep On task
- Invite Diverse Group of People
- Structure the Brainstorm
- Prepare the Group to start Thinking Creatively
- Use Note Cards to Write Down / Sketch Ideas
- Share and Explain Ideas on Board or Wall
- Organize Ideas to:
    - Categories
    - Rankings
    - Columns
- Decide to Keep or Remove Ideas
- Record All Data from Brainstorm
- Have Ideas Flushed Out (Sketched, Rendered, Diagramed, etc. . .)
- Follow Up Meeting with Flushed Out Ideas

CAD Prototype

Prototype phase prototype can be many different types. They can be a tangible foam model, an SLA (Stereolithography) 3D printed model or even a paper mockup. Even the 3D CAD model can be a prototype. It can convey volume, show aesthetic appearance in different light with multiple colors as well as show materials with texture and patterns. Here you can use the prototype to prove out any design functions, surface issues, ergonomics with regard to human factors, etc…

CAD Prototype Bullet Points:

- Prototypes can come in many different forms
- 3D CAD Models
    - Aesthetics
    - Volume, Weight, Dimensions
    - Assemblies
    - Analysis Testing
- 3D Printed Models
- SLA (Stereolithography) Model
    - Surfaces Issues
    - Design Functions
    - Ergonomics
    - Human factors

Additional Information

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