

# Design

A brief explanation of Design and its application.

Design Thinking

Design

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Thinking

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# Design Thinking

Design Thinking is a term used to describe the approach of understanding customer's or user's needs, wants and expectations to create opportunities & ideas that make the human life easier.

Design Thinking techniques can also be used to creatively solve problems. Since a 'problem' reflects an existing product or system's failure to meet user's needs or expectations, Design Thinking turns problems into opportunities.

Each opportunity needs a suitable idea that can be quickly and accurately conveyed, manufactured and then converted into commercial value as a product or service.

# Design

Design is a creative activity and is continuous, cyclical and iterative. To design is to create something new; a completely new product or a new part of an existing product.

To create a 'design' is a conscious decision to stop creating; often when a product meets the customer's expectations.

Design is not just an attribute. Design is a process. Design applies to the micro and macro levels. Design is the detail and the strategy.

The Design Process starts with understanding our customers or users. It's our customers who we are designing for. Understanding human's thoughts and behaviours when interacting with different environments is the greatest source of opportunity.

A Designer constantly practices design thinking, applying a variety of methodologies to uncover user's behaviours.

A Designer's skill is the ability to quickly consolidate a multitude of factors and then represent them graphically and physically in two or three dimensions.

# Design Knowledge

Design encompasses the following knowledge and skills:

Human Factors - is the application of psychological and physiological principles to the design & engineering of products, processes, and systems. Understanding human factors enables designers to create the most valuable products for customers. Customer & Market Research provides great insights to the cognitive processes driving human behaviour. Human Factors leverages the 5 senses to perform a task and create a response. Below is a list of knowledge and skills designers access.

- Psychology – the science of behaviour and mind. Understanding thoughts by observing human behaviour within an environment, while interacting with physical and virtual products. As such, thoughts are affected by beliefs, experiences, cultures.
- Physiology – the study of the functions and mechanisms which work within a living system.

## Design Knowledge continued...

- **Semantics** – a branch of linguistics and logic concerned with meaning involving writing (visual), speaking (oral) and hearing (aural).
- **Semiotics** – the study of signs and symbols, their interpretation and use (visual).
- **Haptics** – interaction using touch.
- **Audiology** – the study of hearing.
- **Acoustics** – the study of sound.
- **Osmology** – the study of smells and olfactory processes (smell).
- **Ergonomics** – the study of human's efficiency in their environment. Ergonomics encompasses all the above.
- **Sketching & Drawing** – often initially by hand using artistic medium or aided by a computer.
- **Technical Drawing** – the application of geometric dimensioning and tolerancing.
- **Materials** – properties, processing and manufacturing.

Designing is practicing the discipline of Design.

# Design Disciplines

Pure Design disciplines are traditionally considered part of the artistic field, although the design process is applied widely from fine art and reaches into technical fields of architecture, engineering & science.

- **Industrial Design** is product design for mass manufacture. For a product to appeal to a large sector of the human population a deep understanding of the customers is critical. The better a population's needs and expectations are understood, the more successful a product is likely to be.
- **Architecture** creates the buildings and structures in which we live and work.
- **Interior Design** focuses on creating function and feeling within a space humans live and work.
- **Furniture Design** specializes in the creation of movable objects intended to support various human activities.
- **Graphic Design** or Visual Communication is the main technique that enables a designer to translate their thoughts to other people than solely relying on written words or language.
- **Technical Illustration** conveys the construction or function of an product or building and follows a standard geometric language.

# Design Quality

Quality is defined by the customer. If the customer's wants and needs are translated into a good product specification then the customer's expectations are met and they are satisfied. If a product is designed poorly then it does not deliver the intended function resulting in dissatisfied customers, problems and opportunities to improve.

Good Quality is consistently delivering product performance.

Quality is part of the Value Equation.

The Value a customer perceives (V) can be expressed as the ratio of a product's performance (P) and the cost (\$ or time).

$$V = P / \$$$

To increase the value to the customer, designers need to increase the quality and/or reduce the costs.

If the product's function is perceived to be delivered with good quality and the perceived cost is low, then the perceived value is high and customers are very satisfied.

# Thinking

Thinking is the cognitive or psychological process which allows human beings to model and make sense of the world around us.

# Design Doing

Maybe we should revisit the definition of Design Thinking.

“Design Thinking” is the cognitive process of applying human factors knowledge to create a product.

Design Thinking is the beginning of learning about Design.

“Design Doing”  
is applying the science  
and practicing the art of Design.