MODULE-1

Introduction to Design Thinking

Introduction to Design

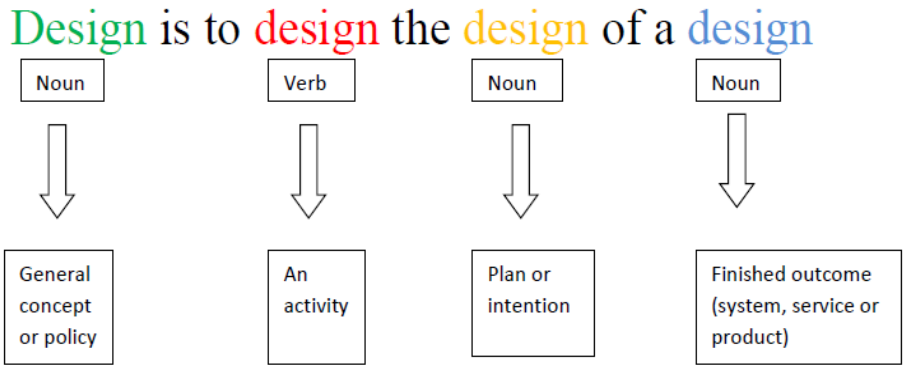
"**Design**" is a process for deliberately creating a product to meet a set of needs. Mobile app development requires both engineering design and product design.

Engineering design focuses on physics, such as speed, mass and other performance measures while product design also considers user and consumers by asking what the user wants in a product. Thus, Design is a realization of a concept or idea into a configuration, drawing or a product.

Design: plan of a system, its implementation and utilization for attaining a goal (change undesired to desired)

Designing: How a design is developed (Both Goal and Plan)

Designs can be for: Technical systems, Educational systems, aesthetic systems (logo design, advertisements), legal systems, social, religious or cultural systems, theories, Models etc.



Difference between Design and Engineering Design

Design	Engineering Design
The specification of an object manifested by an agent, intended to accomplish goals in a particular environment using a set of primitive components , satisfying a set of requirements subjected to constraints	Engineering Design is the process of devising a system, component or process to meet desired needs. It is decision –making process (often iterative) , in which the basic sciences, mathematics and Engineering sciences

	are applied to convert resources optimally to meet the stated objective
Design is often used in two different contexts : Action or understanding (verb) Physical construct of object of plan (noun)	The fundamental elements of the Engineering design process include: the establishment of objectives and criteria, synthesis, analysis, construction, testing and evaluation.
There are many ways to define design and they may depend on a specific context or filed of design	The formal definition of engineering design depend on the specific engineering

Elements of Design

- Key elements include line, dot, shape, form, and color.
- Each element plays a unique role in shaping design outcomes.

Dots

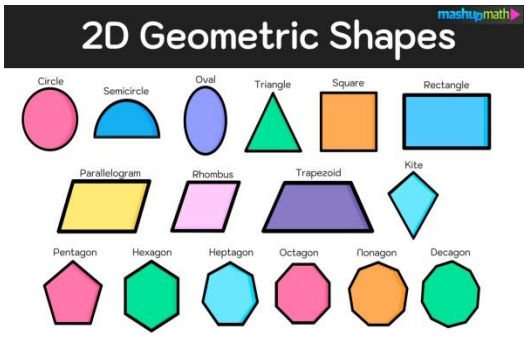
- A dot can mark the beginning and end of a line.
- A dot serves as a basic visual unit that can signify points of interest.
- It can represent a focal point or a starting point for a design.
- Dots can be combined to create patterns or textures in design.

Lines

- A line is a fundamental element that defines space and creates structure.
- Lines can be straight, curved, thick, or thin, influencing the design's character.
- They guide the viewer's eye and can convey emotions or movement.

Shapes

- Shapes are formed by combining lines and dots, creating recognizable forms.
- They can be geometric (like squares and circles) or organic (like free-form shapes).
- Shapes contribute to the overall aesthetic and function of a design.



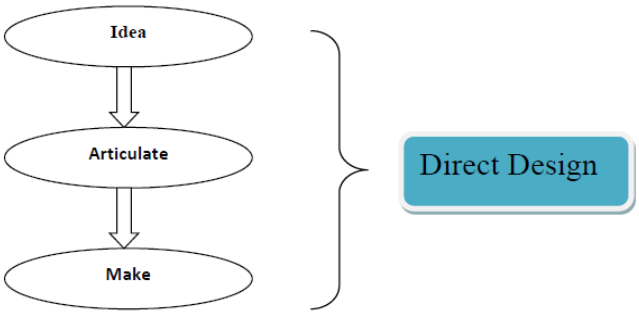
Forms

- Form refers to the three-dimensional aspect of design, adding depth to shapes.
- It can create a sense of physical presence and usability in a design.
- Understanding form is crucial in product design and architectural applications.

Principles of design

- Blue print of something-a plan for change
  Undesirable situation (present) + Implemented plan= Desirable situation (future)
- Whether a situation is undesirable and what aspects are desirable depends on matter of perception.
- Whose perception, where it is perceived, and when it is perceived plays important role.
- Understanding & solving a problem:: termed as Designing
- **Problem understanding:** process or activities for identifying undesirable situations and desirable situations.
- **Problem solving:** Developing a plan with the intent of changing undesirable situations to desirable situations
- Designing involves both problem understanding and problem solving

- Designing becomes easier when problem is understood thoroughly.



Design thinking

- Design thinking is a methodology that designers use to brainstorm and solve complex problems related to Designing and Design engineering.
- Design thinking is a human- centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success.
- A process that results in a plan of action to improve situation.

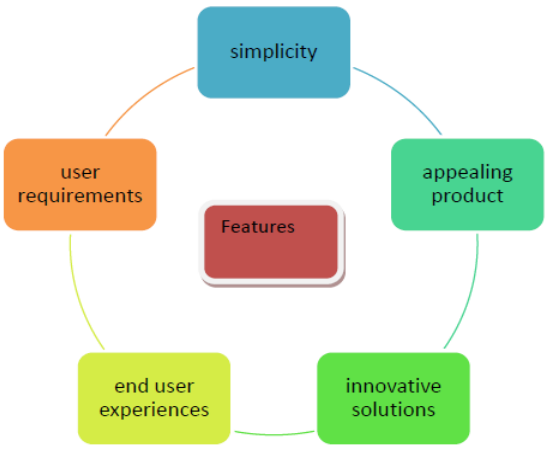
- Design thinking is a **blend of logic**, **powerful imagination**, **systematic reasoning** and intuition to bring to generate the ideas to solve the problems with desirable outcomes .it helps to bring creativity with business insights.
- Design thinking helps to **gain a balance between the problem statement and the solution** developed.

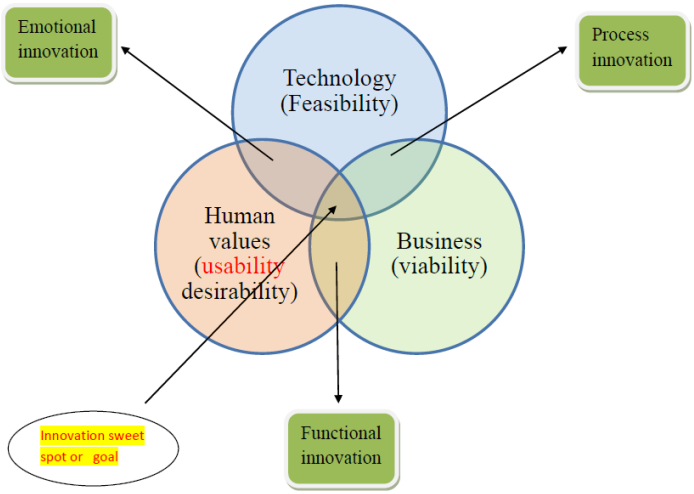
Features of design thinking:

Design thinking provides multi dimensional solutions to the problems.

Features are:

1. Finding simplicity in complexities
2. Having a beautiful and aesthetically appearing products
3. Improving clients and end users quality of experience
4. Creating innovative, feasible and viable solution to real world problems.
5. Addressing the actual requirements of the end users.





Outcome of Design Thinking

1. New products
2. New services
3. New Process
4. Innovative products
5. Innovative Services
6. Innovative process

History of Design Thinking

1. Early Beginnings (Before the 20th Century)

- Design thinking started with people like architects and engineers who created things with a focus on functionality and improving everyday life. Early Origins (19th Century)
- At the end of the 19th century, pioneers like John Dewey and William Morris laid the groundwork for design thinking

2. The Birth of Industrial Design (20th Century)

- The early twentieth century was the cradle of the concept of industrial design
- Raymond Loewy and Henry Dreyfuss emerged as influential proponents of industrial design, shaping the field with their innovative approaches.
- Loewy, the designer of the famous Coca-Cola bottle and Shell logo.

3. The Rise of Human-Centered Design (1960s - 1970s)

- The 1960s and 1970s brought the appearance of human-centered
- Herbert Simon, a well-known personality at the time, regarded decision-making as the very core of problem-solving and suggested to bend the design of systems so as to correspond to people's mental models and abilities.

4.The Stanford d.school and IDEO (1980s - 1990s)

- IDEO, one of the most successful consulting firms, brought design thinking to the forefront through its illustrious way of conceiving the process. IDEO’s approach is multidisciplinary and it encourages the formation of teams complete with a diverse array of skill sets

5.Design Thinking Goes Mainstream (2000s - Present)

- "The Art of Innovation" by Tom Kelley and "Change by Design" by Tim Brown, have contributed to the broader acceptance of design thinking