# Design Thinking [week-5 theory]

Introduction

- Design thinking is a methodology that designers use to brainstorm and solve complex problems related to designing and design engineering. It is also beneficial for designers to find innovative, desirable and never-thought-before solutions for customers and clients.

- Design thinking is used extensively in the area of healthcare and wellness, agriculture, food security, education, financial services, and environmental sustainability.

- Design thinking has helped in the digital space, contributed to the development of physical products, spurred social innovation projects and much more.

- The iterative design process helps the designers to involve clients and customers in meaningful ways. It is not just a strategy to come up with feasible solutions to a problem, but also a method to think of unimaginable solutions and then trying to make them not just feasible, but also viable.

- Design thinking is a blend of logic, powerful imagination, systematic reasoning and intuition to bring to the table the ideas that promise to solve the problems of the clients with desirable outcomes. It helps to bring creativity with business insights.

- Design thinking is a non-linear, iterative process that can have anywhere from three to seven phases, depending on whom you talk to.
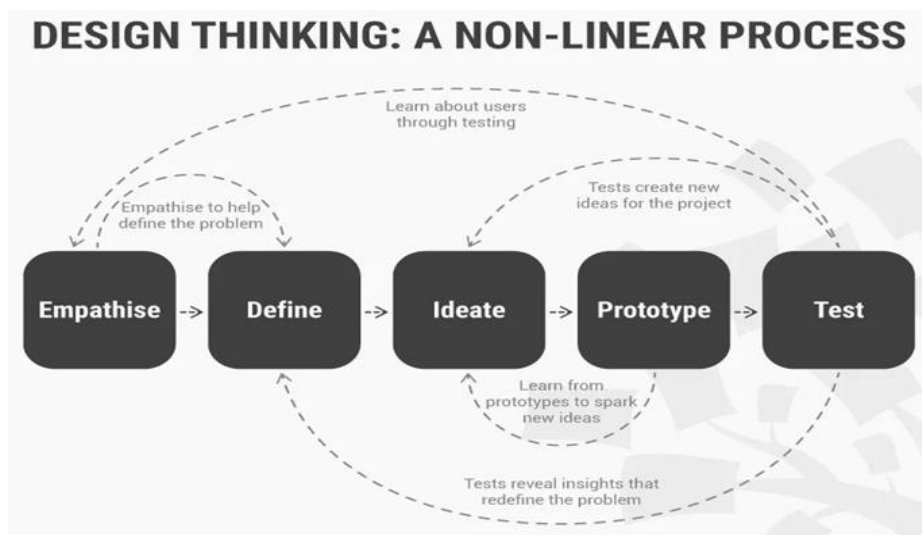
There are five stages of design thinking, they are as follows,

1. **Empathize** - research your users' needs.
2. **Define** - state your users' needs and problems.
3. **Ideate** - challenge assumptions and create ideas.
4. **Prototype** - start to create solutions.
5. **Test** - try your solutions out.

Definition

"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."

"Design thinking is a noteworthy approach to building custom software products. It brings together clients' business goals and end user need and embeds them in a perfectly tailored solution that addresses the problem as effectively as possible."

5 stages of design thinking

Stage 1: Empathize - Research Your Users' Needs

Empathize: the first phase of design thinking, where you aim to gain real insight into users and their needs.

- The first stage of the design thinking process allows you to gain an empathic understanding of the problem you are trying to solve.
- You will consult experts to find out more about the area of concern, and conduct observations to engage and empathize with your users.
- You may also want to immerse yourself in your users' physical environment to gain a deeper, personal understanding of the issues involved-as well as their experiences and motivations.
- Empathy is crucial to a human-centered design process. Depending on time constraints, you will gather a substantial amount of information at this stage to use during the one that follows.
- The main aim of the Empathize stage is to develop the best possible understanding of your users, their needs and the problems that underlie the development of the product or service you want to create.

Stage 2: Define - State Your Users' Needs and Problems

Define

Define: the second phase of design thinking, where you seek to define the problem statement in a human-centered manner.

- In the Define stage, you will accumulate the information you have created and gathered during the Empathize stage.
- You'll analyse your observations and synthesize them to define the core problems you and your team have identified up to this point.
- You should always seek to define the problem statement in a human-centered manner as you do this.
- The Define stage will help the designers in your team gather great ideas to establish features, functions and other elements to solve the problem at hand - or, at the very least, allow users to resolve issues themselves with minimal difficulty.
- In the Define stage, you will start to progress to the third stage, Ideate, where you ask questions to help you look for solutions.

Stage 3: Ideate - Challenge Assumptions and Create Ideas

Ideate

Ideate: the third phase of design thinking, where you identify innovative solutions to the problem statement you've created.

- During the third stage of the design thinking process, designers are ready to generate ideas.
- You've grown to understand your users and their needs in the Empathize stage, and you've analysed and synthesized your observations in the Define stage to create a human-centered problem statement.
- With this solid background, you and your team members can now start to "think outside the box", look for alternative ways to view the problem and identify innovative solutions to the problem statement you've created.
- This allows you to generate as many ideas as possible at the start of ideation.
- You should pick other ideation techniques towards the end of this stage to help you investigate and test your ideas, and choose the best ones to move forward with-either because they seem to solve the problem or provide the elements required to circumvent it.

Stage 4: Prototype - Start to Create Solutions

Prototype

Prototype: the fourth phase of design thinking, where you aim to identify the best possible solution.

- The design team will now produce a number of inexpensive, scaled-down versions of the product (or specific features found within the product) to investigate the key solutions generated in the Ideate stage.
- These prototypes may be shared and tested within the team itself, in other departments or on a small group of people outside the design team.
- This is an experimental phase, and the aim is to identify the best possible solution for each of the problems identified during the first three stages.
- The solutions are implemented within the prototypes and, one by one, they are investigated and then accepted, improved or rejected based on the users' experiences.
- By the end of the Prototype stage, the design team will have a better idea of the constraints inherent to the product and the problems it faces. They'll also have a clearer view of how real users would behave, think and feel when they interact with the end product.

**Stage 5: Test - Try Your Solutions Out**

Test

Test: the fifth (but not necessarily final) phase of design thinking, where you test solutions to derive a deep understanding of the product and its users.

- Designers or evaluators rigorously test the complete product using the best solutions identified in the Prototype stage.
- This is the final stage of the five-stage model; however, in an iterative process such as design thinking, the results generated are often used to redefine one or more further problems.
- This increased level of understanding may serve to help you investigate the conditions of use and how people think, behave and feel towards the product, and even lead you to loop back to a previous stage in the design thinking process.

- You can then proceed with further iterations and make alterations and refinements to rule out alternative solutions.
- The ultimate goal is to derive as deep an understanding of the product and its users as possible.

Understanding the process of design thinking using an example

Let's take the software development process as an example.
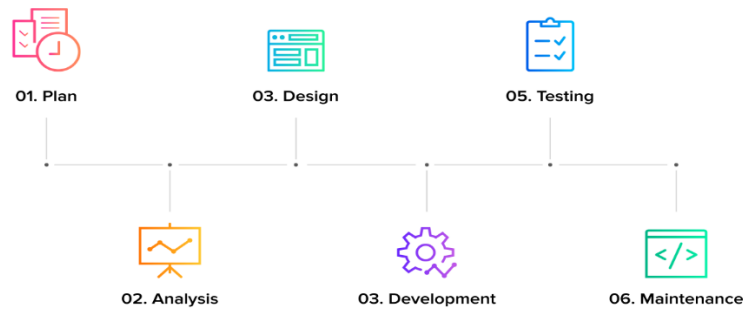
To make it as clear as possible: design thinking can be applied at each stage of software development lifecycle (planning, development, testing, etc.), including design.

Why is design thinking so important in the context of software products design and development?
Let's first take a look at design thinking with respect to design as a stage of software development lifecycle.

Design Thinking at the software design stage: details are everything

Why are IT industry professionals trying very hard to make each detail in product design perfect and think over the colors of buttons, etc.?

The prime example we have mentioned above: **the color of a button**. "But this is a minor detail!" you might say. In practice, this is a significant factor since it to some extent determines whether customers will use your product.

Sometimes users cannot instantly find a button they are looking for and then two scenarios come into play:
1) annoyed, they close your app window;
2) they spend quite a time trying to find the button leading to the functionality they need. Both cases are bad for you. And both of them mean that user problem was not taken into account at the design stage.

Design thinking at this stage allows companies to avoid problems like this. When you have a thorough knowledge of what user problem is (the define step) you can suggest a few solutions to this problem (the ideate step) and finally choose the best one and create the best possible design for all product elements.
As a result, end users do not get confused when utilizing your product and eventually turn into your loyal customers.

On the other hand, design thinking is a powerful tool that through specific design enables companies to make customers do what they want (spoiler: and they do not mind).

All the same button colors may encourage users to take an action you need them to, for example, schedule a webinar or request the trial version of your product.

Or just look at prominent browser notifications: when, for example, a media website you are visiting offers to instantly notify you of important news. Take a look at two buttons you, as a rule, see in such a case.

Yes   No

The first one is the Yes (allow) button, clicking which you agree to receive push notifications. Another one is the No, thanks (block) button.

We are used to the fact that the green color usually implies consent, while its complementary color-red - means the dissent. As red traffic signs say that something is forbidden, a red button says that by clicking it we disagree to receive push notifications from the website.

The trick is that some media put the Yes label on the red button. Also note the order: yes, usually goes the first but not in this case.

No   Yes

Thus, we, who do not want to get bogged down in spam, intuitively click the red button to turn down the offer to receive notifications, but, instead, start to receive them.

These are just a few examples that demonstrate the power of design thinking in software design.

Speaking of buttons, color is not the only parameter that matters. Size, shape, location, order, button labels and beyond are things to keep in mind. As you understand, buttons are just the tip of the iceberg.

Design Thinking at the software development stage

Now let us consider design thinking at another stage of software development lifecycle - development itself.
Take a look at a simple example: **mobile shopping app development.**

In small teams, where there are no UX designers and business analysts, their functions are assumed by business owners or sometimes by software developers. To build a high-grade product, they delve deep into the problems of users and look at each feature with users' eyes.

When it comes to e-commerce shopping, it is much more convenient to utilize a mobile app when on the go, rather than wait for a page to load in a browser. The problem lies in the fact that many storefront apps turn out to be misleading: to find a product they need, customers have to wander endlessly through multiple sections and scroll down long pages.

With the help of design thinking approach, developers pass all stages, from empathy to testing, and strive to provide users with a solution that would make the search across products as fast and convenient as possible. They carefully consider all elements, arrange them logically and do everything to make customer journey as comfortable as possible.

Naandi Foundation's Example

Naandi Foundation

In the city of Hyderabad in India, Naandi Foundation's community water treatment plant provides safe water. However, villagers still use free water which is not safe for consumption and makes people sick. The villagers use unsafe water not because of affordability issues or accessibility issues, but because of the flaws in the overall design of the system.

The problem is that the womenfolk cannot bring the heavy containers of water back to their homes from the plant. Such problems can be solved by design thinking process. Consider it as an exercise to think of ideas how this problem faced by the villagers can be solved by design thinking methodology.

Case Study

1. **Case Study - Venice Family Clinic**

The example of Venice Family Clinic, cited in one of the earlier sections, is the best example to be quoted. The innovators at Venice Family Clinic found that the pit crews at auto races worked in a coordinated manner to save every fraction of a second. They thought if this model could be replicated in the reception area of the clinic. They then came up with the idea of making the reception mobile. The idea was to have someone walk up with an iPad or a tablet to the patient and welcome each of the patients individually.

They collaborated with the Art Centre College of Design in Pasadena and architects from Houston/Tyner in Torrance, and they simulated the entire idea in the area of a future children's clinic. The healthcare providers and operation staff could actually move about easily and play their respective roles.

2. **Case study - Eric Duncan**

A similar experience was observed in the emergency department of Texas Health Presbyterian Hospital, Dallas, where a patient called Eric Duncan reported with a few symptoms like low-grade fever, dizziness, and pain. He was later diagnosed with Ebola. How could the doctors miss the symptoms of Ebola when he was first diagnosed? The Electronic Health Record (EHR) was checked and was found to be flawless too.

The problem was that the EHR system worked only when the patients conformed the way they worked to the way EHR worked. The major flaw, hence, in EHR was that it was engineered. Now stress was put on gaining an understanding of how a system is likely to be used and then create the system in accordance with that understanding.

3. **Case Study - Access to Clean Water**

According to Tim Brown, the CEO of IDEO, design thinking in healthcare is important. In one of TEDMED talks, he asked how can there be better access to clean drinking water for people from rural areas and at the same time, usher in innovation for local

water providers. His team teamed with 11 water providers across India, brainstormed on how to bring innovation in water supply.

A competition was held amongst the providers. Five of these providers were provided seed funding for their ideas and this helped in buying new vehicles, new equipment, etc. In another case, in India, an NGO found that with better water filtration systems and good transport facilities, the subscription to clean water increased fourfold. These examples show how design thinking can help in healthcare.

4. Case study − Embrace Baby Warmer

Design thinking gives a collaborative, human centered approach to solve some of the most pressing issues of the world. The Embrace Baby Warmer is a solution that a team of students from Stanford University came up with to solve the issue of providing a maintained temperature for six hours to a new-born baby. This has helped more than 22,000 low birth weight babies around the world to stay warm. In Nepal, low birth weight babies often developed fatal hypothermia because of the dysfunctional incubators. The areas which lacked electricity were suffering from this problem.

Using design thinking methodology, the students came up with an innovative solution. The sleeping bag which they developed for new-borns is portable and does not need electricity. This way, lives are saved without any dependency on incubators.

Design thinking puts stress on quickly prototyping the solution and tests it so that the designers can take feedback quickly and work on the suggestion at the earliest. There have been many examples of social innovation in the past by the students of Stanford University in countries like Bangladesh, Nepal, India, Pakistan, etc. and many are still ongoing. Design thinking helps people from all disciplines to try and look out for solutions to the pressing situations and problems of the world around.