



A Study on Concepts, Tools, Application and Uses of Design Thinking.

Author : Dr. Rafana Kazi –Nakid. Asst. Prof A.I's Allana Institute of Management Studies, Mumbai.

Co Author : Mr. Shagaf Nakid. I/c CEO, Anjuman-I-Islam, Mumbai.

Abstract: This study is undertaken to gain insight on how design thinking can transform the way to develop products, services, processes, solution and even strategy. To gain knowledge on the notion of design thinking and how it works. Design thinking encourages to solve complex problems through intuition by the creation of future ideal states, as design thinking takes a different approach to identify the hidden needs of what people want and need in their lives and what they like or dislike about a particular product or services how they are made, packaged, marketed, sold and supported. The researcher in their study has made an attempt to learn the four principles of design thinking and also the phases/stages of design thinking and how it helps to transform or develop product or services. The research has tried to gain a clarity on how design thinking has been used as a tool in various business/ industrial sectors.

Keywords: Design thinking, tool, concept transform, process, services, design thinking principles, design thinking phases, applied, used.

Introduction: Design thinking is a user-centric, solutions-based approach to problem-solving. Design thinking is an iterative method in which we seek to understand the users challenge, assumptions and redefine problems in an attempt to identify alternate strategies and solutions that might not be instantly perceived with our initial level of understanding. In a way design thinking provides a solution-based approach to solving problems. It is a mode of thinking and working as well as a collection of hands –on-methods.

Today we can view design thinking as an approach, Nowadays Design thinking has become a business buzzword that's changed how companies approach problem-solving. Countless and some of the world's leading brands such as Apple, Google, Samsung GE Healthcare, Netflix, and UberEats, have embraced the design thinking approach to develop effective solutions to meet challenging task . In the present time the business organizations through their design teams are using Design thinking approach to tackle ill-defined or unknown problems, where in the stages/process of design thinking helps to reframe the problems in human-centric ways and allows designers to focus on what's most important for users. Indeed the design thinking process is gradually becoming popular over the last few decades to many corporate and global organizations because of its ability to generate ground-breaking solutions in a disruptive and innovative way.

Objectives of the Study:

- a. To understand the concept of design thinking.
- b. To learn about the advantages and benefits of design thinking.
- c. To learn about the principles of design thinking
- d. To study the process/phases/stages of design thinking
- e. To Study the application /uses of design thinking in various sectors.

Type of Research: Conceptual study.

Design thinking Concept:

According to Tim Brown CEO and President of IDEO, as defined Design thinking as – ‘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.’

Advantages and Benefits of Design Thinking:

Design thinking can be used as a strategic tool for creative problem solving by prioritizing customers’ requirements above everything else. Design thinking can inspire a person in several opportunities similar to experimenting and creating a prototype model, collecting feedback from customers and redesigning the product using innovative solutions.

The application of design thinking can be applied to various arenas such as architecture, engineering, various business sectors, manufacturing units, operations, etc.

For example if you think like a designer or a design team, it can transform how your organization develops products, services, processes, and strategies. It can help to bring together the *desirability* from the customer’s perspective with concerns to technological *feasibility* and economically *viability*. It aids to provide various opportunities for people who aren’t trained as designers to utilize creative tools so that they can tackle a vast range of problems/challenges.

On the other hand design thinking could as also be used as an approach to find solutions to the problems in contrast to the problem-based approach. Where in the problem-based thinking approach focuses on finding obstacles and limitations on why a problem exists

The key highlights wherein design thinking helps could be it aims to solve the customer’s requirements, it provides Assistancess in tackling ambiguous and challenging problems, it pushes people to create innovative solutions and also comforts an organization’s to run faster with more efficiency.

Design thinking as an approach or as a process has noteworthy benefits:

- **It helps to whelm the creative challenges:** Design Thinking provides you with the freedom to have a look at problems from several perspectives. It involves a lot of brainwork to bring out the best ideas, which helps widen the learner’s knowledge.
- **It helps to efficiently meet the customers’ requirements:** As design thinking involves developing prototypes where you perform testing and implement the customer’s feedback iteratively for quality assurance. Thus the design thinking approach effectually, aids the product to eventually meet the customers’ requirements.

- **It helps widen your knowledge of Design Thinking:** As design thinking allows to perform numerous evaluations in the design thinking process. It tries to improvise the model by implementing the customer's feedback to ensure that the customer is satisfied.

Literature Review:

Design thinking in effect came into view between the 50s and 60s. While there is no specific event that can pinpoint the origins of this concept, both the industrial revolution and World War II pushed the boundaries of the emergence of Design thinking. Engineers, architects, industrial designers, and cognitive scientists, at the time, came together in understanding creative and collective problem solving – which was driven by the significant societal changes then.

John E. Arnold a creative engineer (1959) and L. Bruce Archer in *Systematic Method for Designers* (1965) were the first authors who talked over the idea of design thinking. But Herbert A. Simon was one who mentioned design thinking as a 'way of thinking' and as an approach in his book *The Sciences of the Artificial* in 1969. He also contributed ideas throughout the 70s which are now regarded as principles of design thinking. During the 1970s, design thinking combined human resources, and technological and strategic needs of our times and progressively managed to develop over the decades. Then Buchanan, 1992, viewed design thinking as it could provide solutions to better or worse as opposed to right or wrong and it can take a long time to evaluate solutions, which ramify throughout the system. Where else (Beckman and Barry, 2007) opined that design thinking could facilitate the development of possible solutions to wicked problems, by fostering learning and managing uncertainty. Later (school, n.d.; Brown, 2008; Seidel and Fixson, 2013; Carlgren et al., 2016b; Fleury et al., 2016) stated that, definitions, terminology and the number of process steps described for design thinking vary somewhat in the literature. But (Liedtka 2015), mentioned Design thinking as an philosophy that offers a possible approach to design problems of this complicated nature, (Fleury et al., 2016) suggested that design thinking is suitable for radical and incremental innovation.

Principles and phase / stages of design thinking:

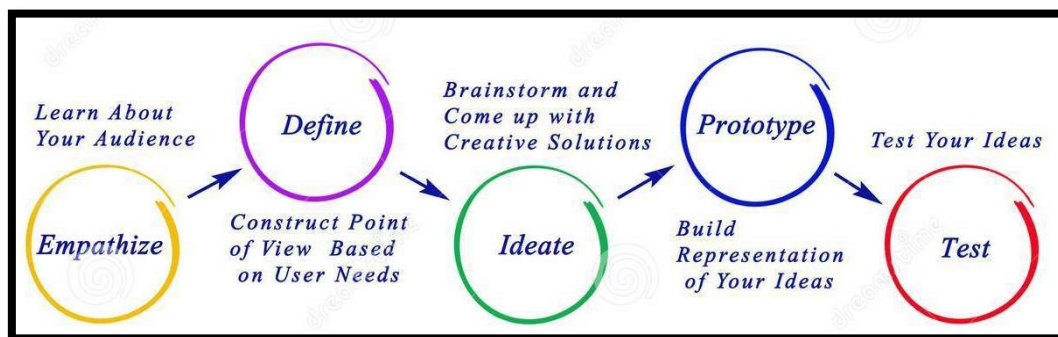
The principles of design thinking are put forth by Christoph Meinel from Hasso-Plattner Institute and Larry Leifer of Stanford University, they are:

1. **The Human Rule:** "All design is social in nature." The problems must be solved by satisfying the human requirements and recognizing the human element in all technologies.
2. **The Ambiguity Rule:** "Ambiguity is inevitable." We perform experiments to the limits based on our knowledge, control events based on our limits, and liberty to see things from different perspectives.
3. **The Redesign Rule:** "All design is redesign." In today's world, technology and social events have been consistently evolving. We must study and analyze how the requirements of humans were met in earlier times.
4. **The Tangibility Rule:** "Making ideas tangible facilitates communication." If we make our ideas tangible for prototypes, it facilitates designers to communicate effectively.



The Five stages of Design Thinking

In the year 1969, Herbert Simon outline one of the first formal models of the design thinking process. The model outlined by Simon consisted of seven major stages, But later a model of design thinking was proposed by Hasson-Plattner Institute of Design at Stanford (d.school) that focuses on the five-stage design thinking stages:



Five-stages Design Thinking Model.

Stage 1: Empathize – Research the Customer’s / User’s needs-

The five-stage Design Thinking model at the stage one/first supports to gain an empathetic understanding of the problem, trying to Solve, typically through customer’s / user’s research. An Empathy is crucial to a human-centred design process like design thinking as it allows to set aside own assumptions about the world and gain real insight into customers/users and their needs.

Stage 2: Define - State the User's Needs and Problems- At this stage mounts up the information generated and gathered during the empathize stage. Annotations are analyzed, to define the core problem. The problem statement has to be defined in a human-centered manner.

Stage 3: Ideate – Challenge assumptions and create ideas – The third stage of design thinking aids to generate ideas. The solid background of knowledge from the first two stages/phases makes the designers to think outside the box, look for alternative ways to view the core problem and identify innovative solutions to the problem statement.

Stage 4: Prototype – Start to create solution – This is an investigational stage/ phase, which aims to identify the best possible solutions for each of the problem identified during the earlier stages/phases. The design teams works on producing a number of inexpensive, scaled-down versions of the products or specific features found within the product to inspect the problem solutions generated in the previous stage.

Stage 5: Test-Try the solutions out: Evaluators or Designers thoroughly test the complete product using the best solutions identified in the prototype stage/phase. At the final stage/ phase – the model prepared are tested. The designers make further iterations, alternations and refinements to rule out alternative solutions.

Applications / uses of Design Thinking as a tool in various sectors:

Design thinking can be used as a tool or in other words applications and use of design thinking could be applied through a various range of professions such as sports, education study and research to business and management. Around the global design thinking is also used widely by many organizations.

Application / Uses of design thinking or using design thinking as a tool in businesses:

The application / uses of design thinking or using design thinking design thinking as a tool is utmost widely used in businesses as it aids to optimize processes particularly with respect to product creation, marketing, and contract renewal . Also in businesses, design thinking advantages design thinkers not only to develop deep empathy for their customers/ users but also tries to create solutions that are tend to specific needs.

Application / Uses of design thinking or using design thinking as a tool in Information Technology industry / sector:

As the information technology (IT) industry/ sector has to continuously keep on upgrading / updating their applications, software's, systems, therefore the IT industry is required to keep testing or requires trials and also proof of concepts of varies products they make. While doing this the IT industry needs to empathize with its customers/users and not just deploy technologies. In the IT industry the developers, analysts, consultants, and managers are required to brainstorm on possible ideas / ways for solving the problems of the clienteles / users. Therein design thinking can be used as a tool.

Application / Uses of design thinking or using design thinking as a tool in Education sector:

Design thinking as a tool can be useful to come up with relevant and creative solutions.

Application / Uses of design thinking or using design thinking as a tool in Healthcare sector:

As the healthcare sector has to deal with providing quality healthcare to people and that too at a lower cost. The use of design thinking in this sector helps to come up with innovative solutions, rules out the inefficiencies in the system and the perennial challenges too. Thus design thinking plays a vital role in the healthcare industry as well.

The application /uses of design thinking or using design thinking as a tool is also used by industries:

Design thinking has turn out to be a pet phrase for many successful businesses today the five most prominent industries that were revolutionized by design thinking are: entertainment, consumables, Banking, Travel and lodging as well as technology and communication.

➤ Inference and Conclusion:

Byword, the design thinking process is an iterative, flexible and focuses on cooperating between designers and users, with an emphasis on bringing ideas to life based on how real users feel, think and behave. Design thinking tackles complex problems. To put it in simpler words Design thinking can be considered as a discipline that uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what viable business strategy can convert into customer value and market opportunity.

Design thinking could also be considered as an approach or as a process wherein it helps us in the process of questioning the assumptions and questioning the implications. Design thinking is extremely useful in tackling problems that are ill-defined or unknown, by re-framing the problem in human-centric ways, creating many ideas in brainstorming sessions and adopting a hands on approach in prototyping, testing, and trying out concepts and ideas.

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