



DEPARTMENT OF INFORMATION TECHNOLOGY
LECTURE NOTES

DESIGN THINKING—U20ITT615

Year / Semester: III / VI

Academic Year: 2024 - 2025



VISION, MISSION, AND PROGRAM EDUCATIONAL OBJECTIVES

VISION OF THE INSTITUTION
To be globally recognized for excellence in quality education, innovation and research for the transformation of lives to serve the society.
MISSION OF THE INSTITUTION
M1: Quality Education: To provide comprehensive academic system that amalgamates the cutting edge technologies with best practices.
M2: Research and Innovation: To foster value-based research and innovation in collaboration with industries and institutions globally for creating intellectuals with new avenues.
M3: Employability and Entrepreneurship: To inculcate the employability and entrepreneurial skills through value and skill based training.
M4: Ethical Values: To instil deep sense of human values by blending societal righteousness with academic professionalism for the growth of society.
VISION OF THE DEPARTMENT
To be a pioneer in the field of Information Technology by achieving academic excellence, involving in research & development and promoting technical & professional expertise.
MISSION OF THE DEPARTMENT
Expertise: To impart quality education and create excellent engineers with strong analytical, Programming and Problem solving skills to meet the ever changing demands of IT industry
Eminence: To kindle creative thinking, innovation and foster value-based research in the field of information technology
Complaisant: To enrich the employability skills, inculcate entrepreneurial ideology and promote professional expertise
Exemplar: To instil moral values, ethical responsibilities and empowering graduates to be socially responsible and technically competent
PROGRAM EDUCATIONAL OBJECTIVES
PEO1 Fortify: To prepare the students with fundamental knowledge in programming languages and in developing applications
PEO2 Equip: To develop skill in understanding the complexity in networking, security, data mining, web technology and mobile communication so as to develop innovative applications and projects in these areas for the betterment of society, as well as to enable them to pursue higher education
PEO3 Endow: To enable the students as full-fledged professionals by providing opportunities to enhance their analytical, communication skills and problem solving skills along with organizing abilities

PEO4 Conventional: To familiarize the students with the ethical issues in engineering profession, issues related to the worldwide economy, nurturing of current job related skills and emerging technologies

PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES

List of PSO's

PSO 1: Establishment of Mathematical and computer systems concepts: To use mathematical and system concepts to solve multidisciplinary problems using appropriate mathematical analysis, system and programming concepts on various computing environments.

PSO 2: Establishment of communication and information concepts: To inculcate good breadth of knowledge to apply and enhance informatics and communication technologies

PSO 3: Establishment of Business, Technological concepts: The ability to interpret and respond to business agility with relevant software tools and skills and provide newer ideas and innovations in information technology research

List of Program Outcomes

PO1 Engineering Knowledge: Apply knowledge of mathematics and science, with fundamentals of Engineering and Technology to be able to solve complex engineering problems related to IT.

PO2 Problem Analysis: Identify, Formulate, review research literature and analyze complex engineering problems related to IT and reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences

PO3 Design/Development of solutions: Design solutions for complex engineering problems related to IT and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural societal and environmental considerations

PO4 Conduct Investigations of Complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 Modern Tool Usage: Create, Select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to computer science related complex engineering activities with an understanding of the limitations

PO6 The Engineer and Society: Apply Reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the IT professional engineering practice

PO7 Environment and Sustainability: Understand the impact of the IT professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development

PO8 Ethics: Apply Ethical Principles and commit to professional ethics and responsibilities and norms of the engineering practice

PO9 Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary Settings

PO10 Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large such as able to comprehend and with write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11 Project Management and Finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi-disciplinary environments

PO12 Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning the broadest context of technological changes.

U20ITT615	DESIGN THINKING	L	T	P	C	Hrs
		3	0	0	3	45

Course Objectives

- To make use of practical design thinking methods in every stage of problem with the help of method templates.
- To apply design thinking to a problem in order to generate innovative and user-centric solutions.
- To empathize with end user and initiate a new working culture based on user-centric approach.
- To prototype and run usability tests for unbiased examination of the product in order to identify problem areas.
- To come up with exposure to design thinking for designing innovative products.

Course Outcomes

After completion of the course, the students will be able to

CO1 - Explain the fundamentals of Design Thinking and innovation. (**K2**)

CO2 - Empathize and analyze model action plan. (**K2**)

CO3 - Describe the principles of innovation and idea generation for product design. (**K2**)

CO4 - Apply design thinking techniques for given tasks. (**K3**)

CO5 - Apply the design thinking techniques for solving problems in various sectors. (**K3**)

UNIT I INTRODUCTION TO DESIGN

(9 Hrs)

Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components. Principles of design - Introduction to design thinking - history of Design Thinking - New materials in Industry.

UNIT II DESIGN THINKING

(9 Hrs)

Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brain storming, product development.

UNIT III INNOVATION AND PRODUCT DESIGN

(9 Hrs)

Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations. Creativity to Innovation. Teams for innovation, Measuring the impact and value of creativity. Problem formation, introduction to product design, Product strategies, Product value, Product planning,

Design Thinking– U20ITT615

product specifications.

UNIT IV DESIGN THINKING FOR STRATEGIC INNOVATION

(9 Hrs)

An exercise in design thinking – implementing design thinking for better process. Implement design thinking process in various Industries. Design thinking for Startups.

UNIT V DESIGN THINKING IN VARIOUS SECTORS

(9 Hrs)

Case studies in Information Technology, Finance, Education, Management and Retail sector. Analyze and Prototyping, Usability testing, Organizing and interpreting results.

Text Books

1. Change by design, Tim Brown, Harper Bollins (2009)
2. Design thinking in the Class Room by David Lee, Ulysses press.
3. Product Design and Manufacturing by A.K. Chitale and R.C. Gupta, Prentice Hall

Reference Books

1. Design the Future , by Shrrutin N Shetty , Norton Press
2. Universal principles of design- William lidwell, kritina holden, Jill butter.
3. The era of open innovation – chesbrough.H

Web References

1. https://drive.google.com/file/d/1cplqb1eOWnoNMhFWNP8TyYLF2qHdGY_K/view
2. <https://nptel.ac.in/courses/110/106/110106124/#>

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	1	-	-	2	2	3	2	2	2	2	2	2	3	2
2	2	1	-	-	2	2	3	2	2	2	2	2	2	3	2
3	2	1	-	-	2	2	3	2	2	2	2	2	2	3	2
4	3	2	1	1	3	3	3	3	3	3	3	3	3	3	3
5	3	2	1	1	3	3	3	3	3	3	3	3	3	3	3

Correlation Level: 1-Low, 2-Medium, 3- High

Introduction to elements and principles of design, basics of design- dot, line, shape, form as fundamental design components. Principles of design- Introduction to design thinking-history of design thinking – New materials in industry

Design Thinking

- It is a process of thinking, collecting and working various hands on methods for solving problems
- Design thinking is a process for creative problem solving.
- Design Thinking provides a solution-based approach to solving problems.
- Design Thinking revolves around a deep interest in developing an understanding of the people for whom we're designing the products or services.
- Design Thinking is an iterative process in which we seek to understand the user, challenge assumptions, and redefine problems in an attempt to identify alternative strategies and solutions that might not be instantly apparent with our initial level of understanding.

For Example, When you sit down to create a product for a business need

The first question should always be

1. what's the human need behind it?
2. for whom we're designing the products or services. ?
3. what's desirable from a human point of view with what is **technologically feasible and economically viable**

Design Thinking Uses

- Design Thinking revolves around a deep interest in developing an understanding of the people for whom we're designing the products or services.
- It helps us observe and develop empathy (understand client need) with the target user.
- Design Thinking helps us in the process of questioning: questioning the problem, 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 and testing.
- Design Thinking also involves ongoing experimentation: sketching, prototyping, testing, and trying out concepts and ideas.

Design Thinking Applications:

Design thinking is applicable no matter your role or industry. Whether you work in business, government, education, or nonprofit, design thinking can help you develop innovative solutions based on the needs of your customers.

Design thinking can help your team or organization:

- Better understand the unmet needs of the people you're creating for (customers, clients, students, users, etc....).
- Reduce the risk associated with launching new ideas, products, and services.
- Generate solutions that are revolutionary, not just incremental.
- Learn and iterate faster.

Design Thinking Phases

Empathy

Empathize with people's needs,



Collaboration

Collaborate with others across disciplines, skill sets, and perspectives,



Inclusion

Include every idea in visible form for evaluation



Repeat/Iterate

Repeat, iterating and testing solutions to perfect them, always with human needs at the center



Introduction to Design.

A design is a plan or specification for the construction of a system or for the implementation of an activity or process. The way in which something is planned and made or arranged

EXAMPLE:

To design a car, dress, house, software, video games etc

Elements of Design

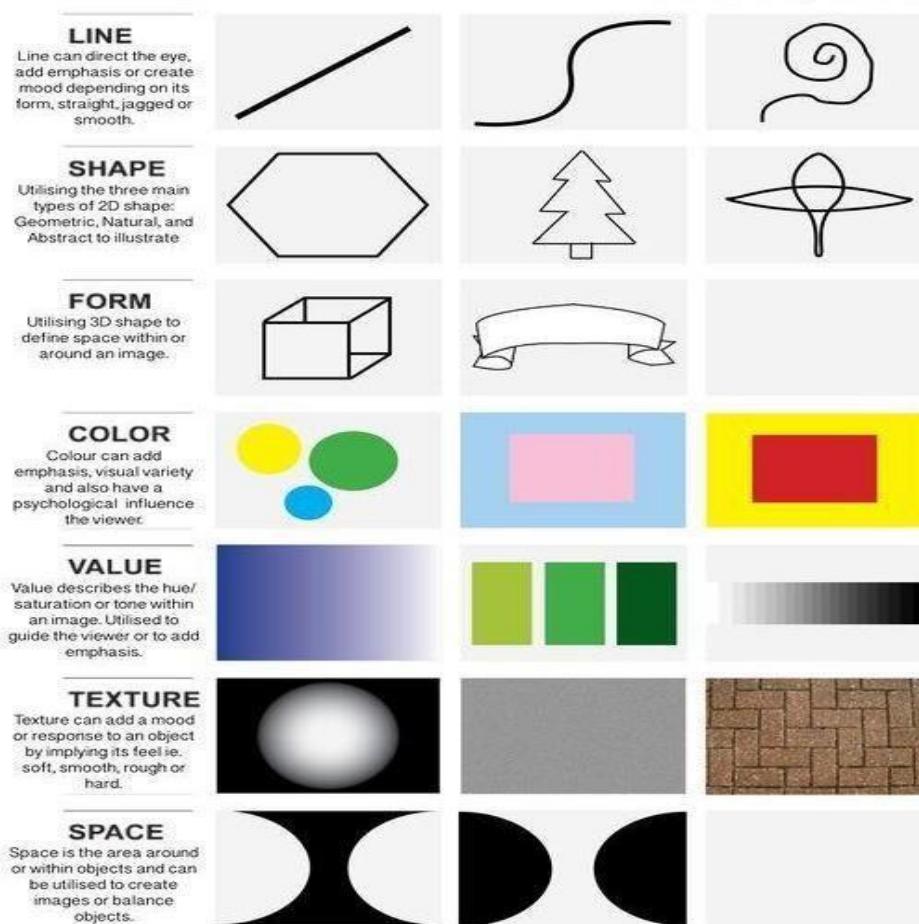
Design Thinking– U20ITT615

The elements of design, are the building blocks used by the designers to create the designs

The elements of design are the fundamental aspects of any visual design which include shape, color, space, form, line, value, and texture.

ELEMENTS OF DESIGN THINKING:

- **Color:** Color helps establish a mood for your composition. Artists and designers use color to depict and describe the subject. Color is used by designers to portray mood, light, depth, and point of view.
- **Line:** Line refers to the way that two points in space are connected. Whether they're horizontal lines, diagonal lines, or vertical lines, lines can help direct the eye toward a certain point in your composition
- **Value** refers to the lightness or darkness of a color. The values of a color are often visualized in a gradient, which displays a series of variations on one hue, arranged from the lightest to the darkest



- **Space:** Making proper use of space can help others view your design as you intended. White space or negative space is the space between or around the focal point of an image. The spacing of your design is important because a layout that's too crowded can overwhelm the viewer's eye.
- **Shape:** In its most basic form, a shape is a two-dimensional area that is surrounded by an outline. There are three types of shapes **organic shapes, geometric shapes** and **abstract shapes**
- **Form:** Utilizing 3D shape to define the space within or around the image designers create the appearance of form on a flat surface by using light, shadow, the appearance of an object's contours, negative space, and the surrounding objects around the subject matter
- **Texture:** Texture is one of the elements of design that is used to represent how an object appears or feels. Tactile texture is a physical sense of touch, whether it's rough, smooth, or ribbed. Visual texture, on the other hand, refers to the imagined feel of the illustrated texture, which can create more visual interest and a heightened sensory experience.

PRINCIPLES OF DESIGN THINKING:

- The principles of design are the rules a designer must follow to create an effective and attractive composition
- The fundamental principles of design are
 - Unity
 - Emphasis
 - Balance and Alignment
 - Hierarchy
 - Contrast
 - Scale
 - Repetition

1. UNITY:

Unity is a force operating within a design that gives it the appearance of oneness or resolution. This ensures no single part is more important than the other.

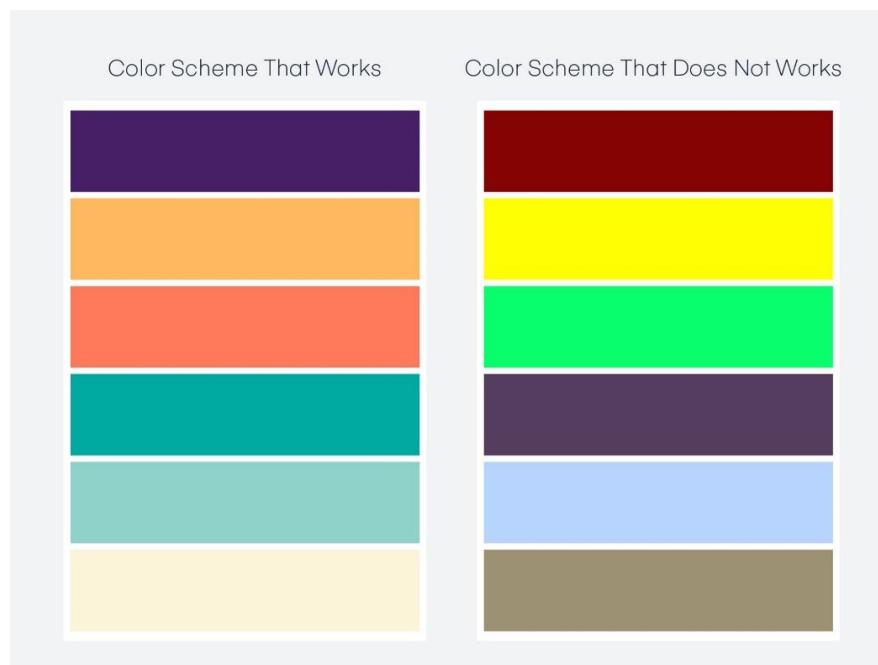


a) Conceptual unity

- In a nutshell, conceptual unity can be described as singleness, or the act of combining things for the user's convenience. It's best achieved by thinking about content and function. For example, if the content or functionality on one screen can be unified with another webpage, screen, or step in the user flow, this reduces the number of interactions required by the user to meet their objective.
- For example, one FAQ entry about saving a file and another about exporting a file could be combined into a single FAQ entry. Though the user may not initially understand the difference between the two, they'll likely end up wanting to read both.
- Or, let's say an action requires the user to be logged in. It would be more convenient to display the login and signup forms side-by-side—as opposed to displaying the login form by default, and having a link to the signup form.
- Conceptual unity requires related actions to be grouped together in a natural, forward-thinking way.

b) Visual unity

- Visual unity is best described as harmony, which is a design principle in its own right. It can apply to colors, using styles that work well together, and in some cases, repeating styles to maintain visual consistency.
- For example, visual unity could be considered when choosing two different colors that need to complement each other well (harmony), or choosing the same color for two different buttons because they're equally important (repetition).



2. BALANCE:

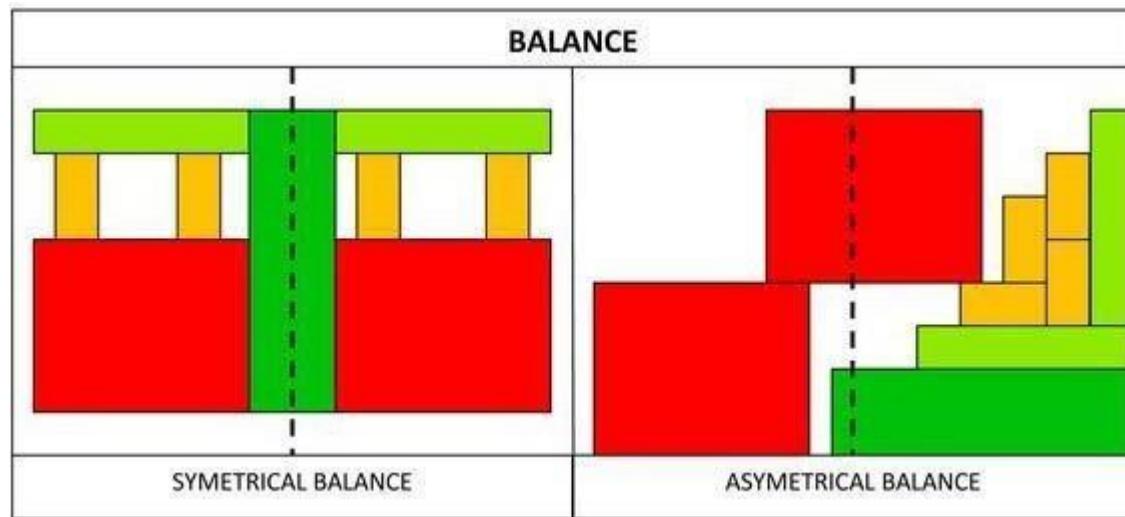
Objects in design carry weight just like in the physical world, but it's called visual weight. The visual weight of a design needs to have balance. It's like putting two objects on a seesaw: If one side is too heavy, the viewer's eye goes directly to the heavy part. If it's weighted with all things equal, the seesaw is perfectly suspended without either side touching the ground.

TYPES:

a) Symmetrical balance

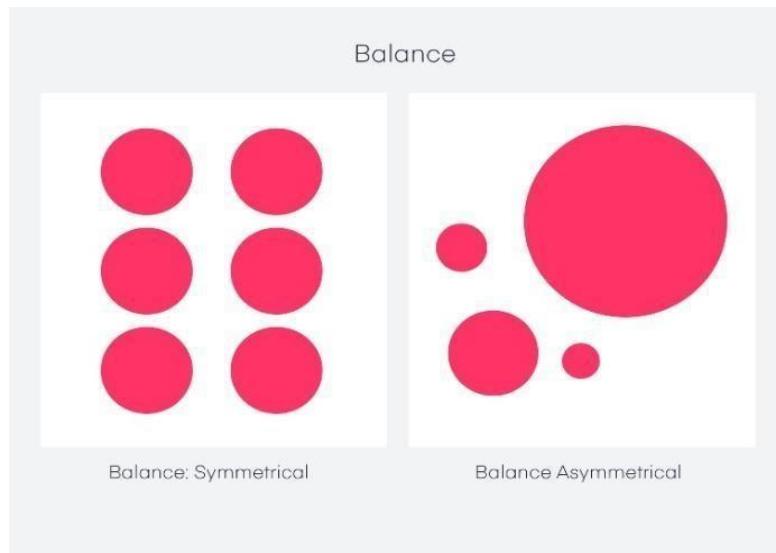
This is perhaps the most common and easily interpreted types of balance where the visual weight of a composition is distributed evenly in every direction. You can draw a vertical or a horizontal line through the design and the visual balance will still be perfectly symmetrical. This type of composition is very well balanced, and gives off the sense of the ‘perfect’ composition. It's worth noting that symmetrical design isn't necessarily the most interesting one.

Although the human eye is drawn to this kind of symmetry, it can be perceived as boring due to lack of a solid focal point. It's also interesting that something as small as changing colors in the composition of asymmetrical balance can throw off the composition making it heavier on one side.



b) Asymmetrical balance

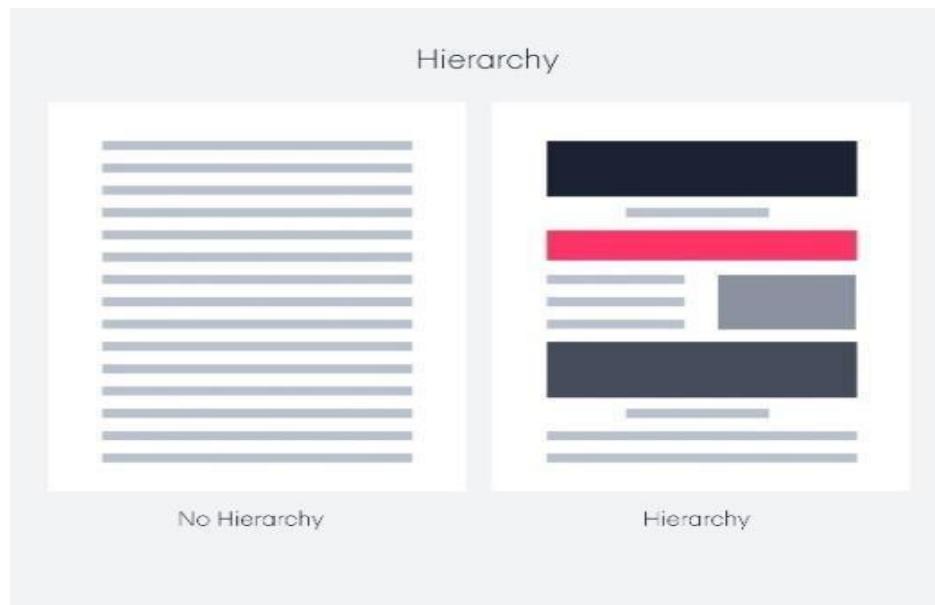
Asymmetrical balance is the intentional gesture to create a sense of tension and movement in a design or photograph. Usually this means that different elements or focal points are not distributed evenly like in a symmetrically balanced composition. With one sight outweighing the other, you still get a sense of balance. This type of balance is best described as one many small objects balancing one big one. It's not balanced, but your eye interprets it as such. This type of composition creates a visual interest that is a bit more appealing because it is unexpected.



3. HIERARCHY

Hierarchy is a visual design principle which designers use to show the importance of each page/screen's contents by manipulating these characteristics: Size – Users notice larger elements more easily. Color – Bright colors typically attract more attention than muted ones.

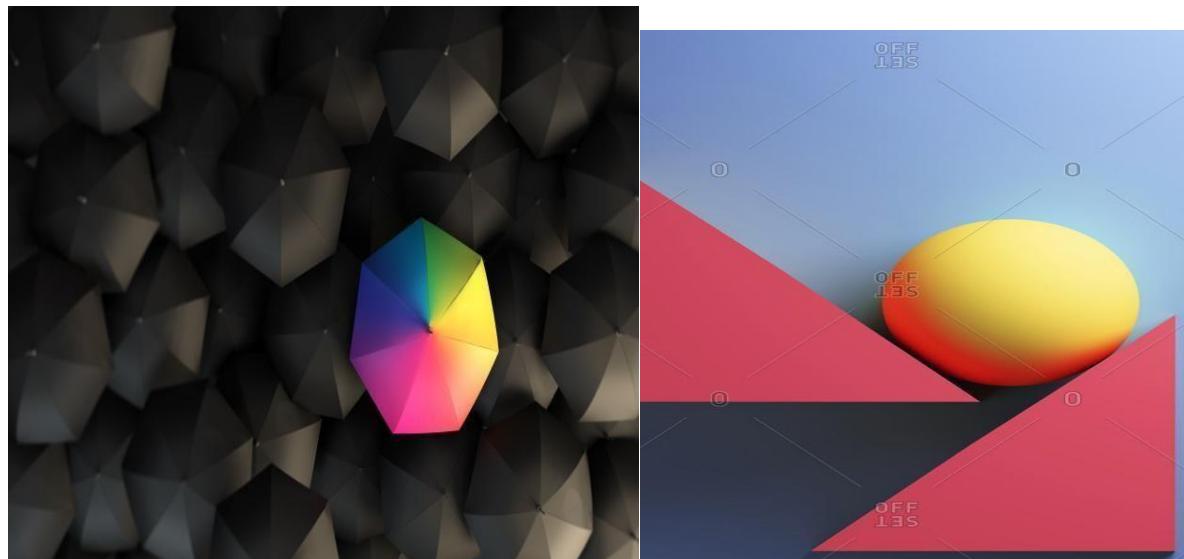
Hierarchy is not based on a design styles, but rather the order of importance. A good design leads the eye through each area in priority order. A good example is a homepage: There's usually a navigation bar and a logo, some sort of large header image, or text with a call to action.



4. CONTRAST

Contrast in graphic design occurs when visual elements placed close together noticeably differ from each other. You might immediately think of color contrast such as red vs. blue or warm vs. cool. While color is an extremely important aspect of contrast, there are contrast of type, alignment and size to consider.

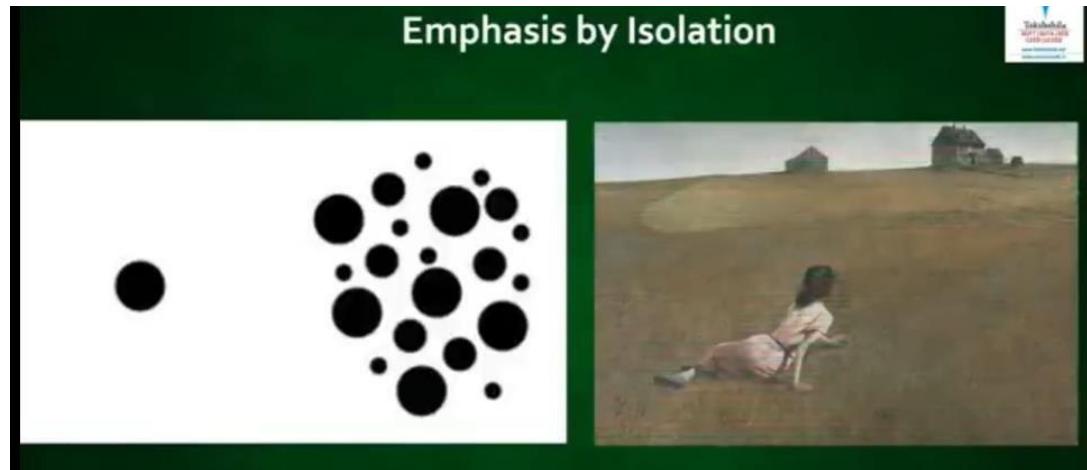
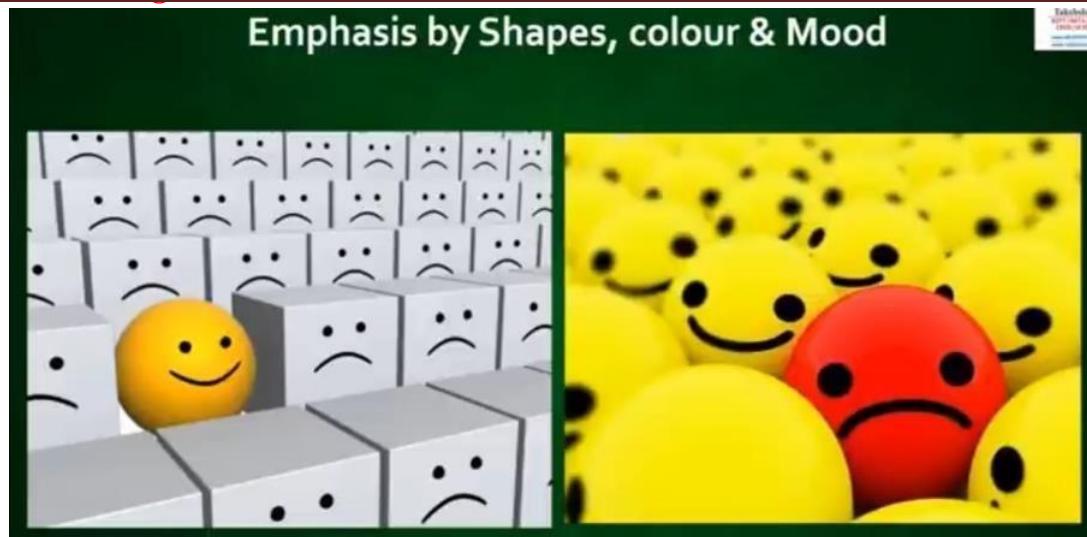
The design principle contrast refers to the use of visually different elements. In addition to capturing attention, contrast can guide the viewer's eye to a focal point, highlight important information and add variety, or even drama, to a design.



5. Emphasis

Emphasis can be created by size, weight, position, color, shape, and style. Sometimes referred to as dominance, emphasis might seem similar to contrast, but it's not quite the same. Contrast deals with the difference between two objects, and emphasis deals with the impact of an object. Design thinking is an iterative, non-linear process which focuses on a collaboration between designers and users.

It brings innovative solutions to life based on how real users think, feel and behave. This human-centered design process consists of five core stages Empathize, Define, Ideate, Prototype and Test



6. SCALE

Scaling design can encompass everything from creating uniformity through systems to spreading design thinking practices throughout the organization—and beyond. Not everyone is on the same page when a company first approaches scaling.

The principle of scale refers to the relative size of one object compared to another, typically the size of the artwork to the viewer's body. Scale can also refer to the size relationships of different visuals within a singular piece of art



7. Repetition/Rhythm

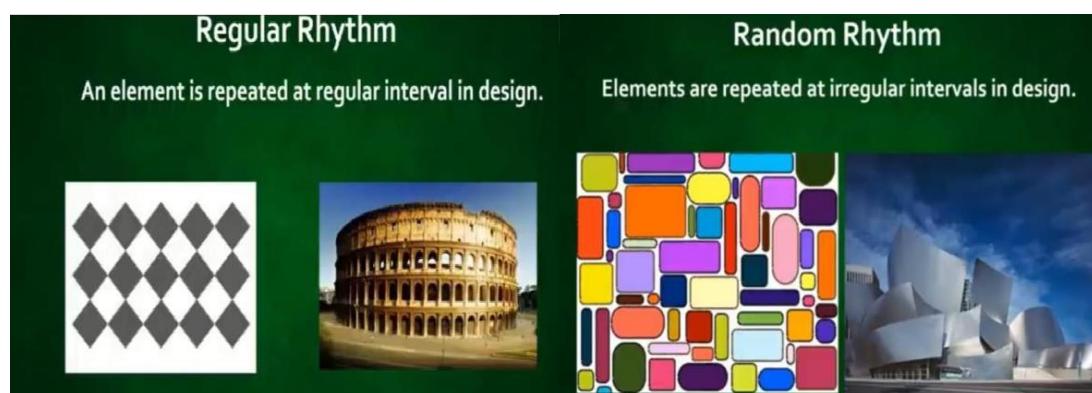
Repetition is the recurrence of a design element, commonly utilized in patterns or textures. Repetitive elements can be used in conjunction with other principles to create a design that leads a user's eye to a focal point, has continuity, or flow.

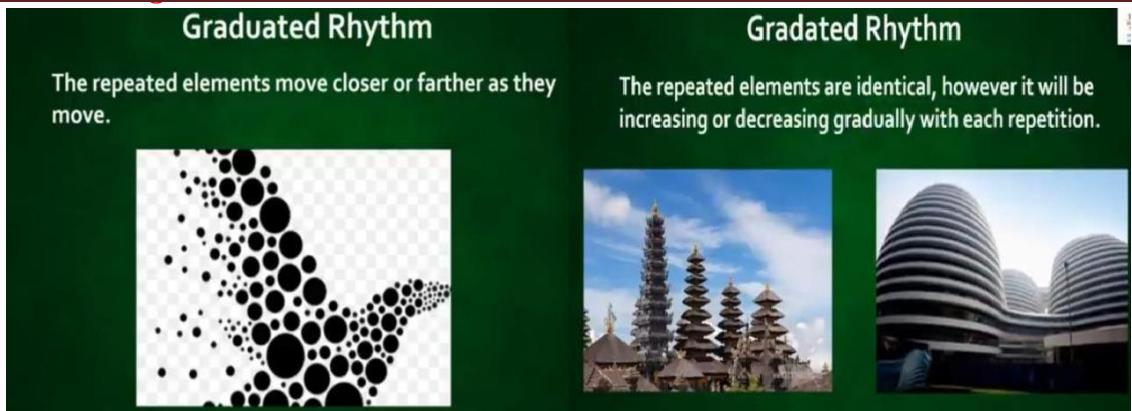
A repetitive element could be repeated lines, shapes, forms, color, or even design elements. Repetition is simply repeating a single element many times in a design.

For example, you could draw a line horizontally and then draw several others next to it. Repetition can be useful in web and app design. For example, you'd expect the logo of a business to be repeated on every page and in the same place

Types of Rhythm:

1. **Random Rhythm.**
2. **Regular Rhythm.**
3. **Gradated Rhythm.**
4. **Graduated Rhythm.**





Why Is Design Thinking so Important?

- In user experience (UX) design, it's crucial to develop and refine skills to understand and address rapid changes in users' environments and behaviors.
- professionals from a variety of fields, including architecture and engineering, subsequently advanced this highly creative process to address human needs in the modern age.
- Twenty-first-century organizations from a wide range of industries find design thinking a valuable means to problem-solve for the users of their products and services.

Introduction to design thinking

- Design thinking is a non-linear, iterative process that teams use to understand users, challenge assumptions, redefine problems and create innovative solutions to prototype and test.
 - **Involving five phases**
- ✓ **Empathize,**
 - ✓ **Define,**
 - ✓ **Ideate,**
 - ✓ **Prototype and**
 - ✓ **Test**

The Five Stages of Design Thinking

Stage 1: Empathize—Research Your Users' Needs.

Stage 2: Define—State Your Users' Needs and Problems.

Stage 3: Ideate—Challenge Assumptions and Create Ideas.

Stage 4: Prototype—Start to Create Solutions.

Stage 5: Test—Try Your Solutions Out.

The Five Stages of Design Thinking

Stage 1: Empathize—Research Your Users' Needs.

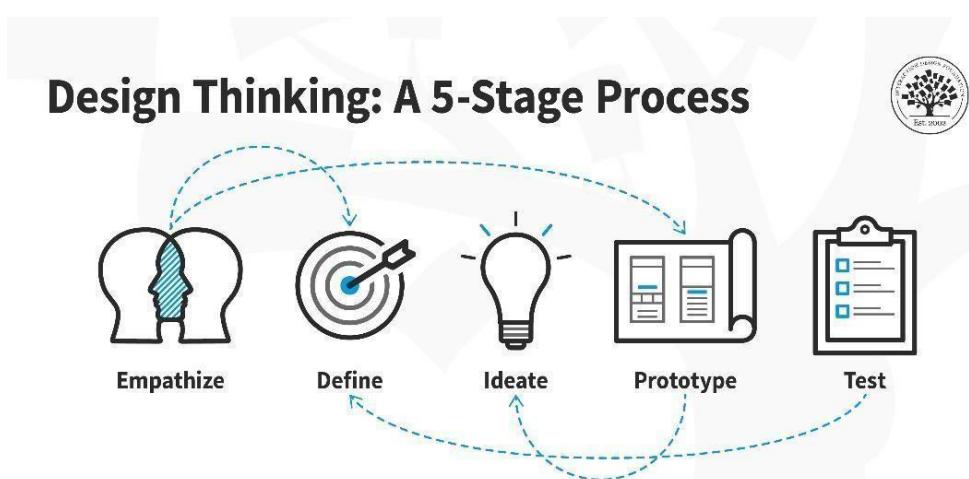
- Here, you should gain an empathetic understanding of the problem you're trying to solve, typically through user research.
- Empathy is crucial to a human-centered design process such as design thinking because it allows you to set aside your own assumptions about the world and gain real insight into users and their needs.

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

- It's time to accumulate the information gathered during the Empathize stage.
- You then analyze your observations and synthesize them to define the core problems you and your team have identified. These definitions are called problem statements.
- You can create personas to help keep your efforts human-centered before proceeding to ideation.

Stage 3: Ideate—Challenge Assumptions and Create Ideas

- Now, you're ready to generate ideas.
- The solid background of knowledge from the first two phases means you can 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.
- Brainstorming is particularly useful here



Stage 4: Prototype—Start to Create Solutions

- This is an experimental phase. The aim is to identify the best possible solution for each problem found.

- Your team should produce some inexpensive, scaled-down versions of the product (or specific features found within the product) to investigate the ideas you've generated. This could involve simply paper prototyping.

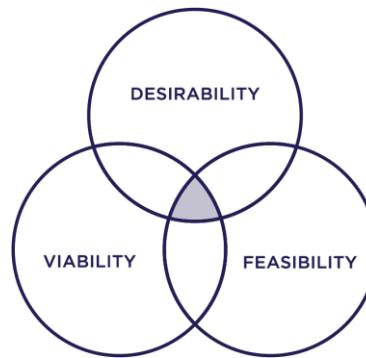
Stage 5: Test—Try Your Solutions Out

- Evaluators rigorously test the prototypes. Although this is the final phase, design thinking is iterative: Teams often use the results to *redefine* one or more further problems.
- So, you can return to previous stages to make further iterations, alterations and refinements – to find or rule out alternative solutions

Design thinking is a human-centered approach to innovation—anchored in understanding customer's needs, rapid prototyping, and generating creative ideas—that will transform the way you develop products, services, processes, and organizations. By using design thinking, you make decisions based on what customers really want instead of relying only on historical data or making risky bets based on instinct instead of evidence.

Design thinking brings together what is desirable from a human point of view with what is technologically feasible and economically viable.

- Desirability: What makes sense to people and for people?
- Feasibility: What is technically possible within the foreseeable future?
- Viability: What is likely to become part of a sustainable business model?



DESIGN PROCESS:

THINKING

Frame a Question

Inspire your team to think about your customers (who you're designing a solution for) and what they actually need.

Gather Inspiration

Go out into the world and seek inspiration by observing and discovering what people really need.

Generate Ideas

Use the inspiration you gather to help push past the obvious to come up with fresh solutions to your problem.

Make Ideas Tangible

Build rough prototypes and find what's working and what's not.

Test to Learn

Test your prototypes, gather feedback, and iterate.

Share the Story

Once you've arrived at the right solution, craft and share the story to introduce it to your colleagues, clients, and customers.

Some of these steps may happen several times, and you may even jump back and forth between them. Moving through the phases of design thinking can take you from a blank slate to a new, innovative solution.

Origin of Design Thinking

- Lack the ability to be creative and on extreme cases, not able to create new products and services that meet unmet needs of their customers
- 20th century education system fostered dominant logic and disregard creativity, people grew up with an overpowered mindset and skill-set of managing value
- Have to Innovate to respond to external change
- To innovate, businesses must have the capacity to design.

History Of Design Thinking

Design Thinking emerged from an exploration of theory and practice, in a range of disciplines and sciences, as a means of addressing the human, the technological and strategic innovation needs of our time.

Design Thinking date back to the 50's and 60's, and struggled to grapple with the rapidly changing environment in those times.

New approaches to solving complex problems had their roots in the thinking applied to World War II, an event that had a profound effect on strategic thinking in the modern world and fundamentally changed the way we apply ourselves to management, production and industrial design.

The 1960's Attempts to Scientise Design

Nigel Cross, Emeritus Professor of Design Studies at The Open University, UK, in the paper *Designerly ways of knowing: design discipline versus design science* (2001)

He given 'design science revolution', based on science, technology and rationalism, to overcome the human and environmental problems that he believed could not be solved by politics and economics

Wicked Problems

Horst Rittel, a Design Theorist known for coining the term "Wicked Problems" (i.e. extremely complex/multi-dimensional problems) in the mid 1960's, wrote and spoke extensively on the subject of problem-solving in design

Wicked problems are at the very heart of Design Thinking, because it is precisely these complex and multi-dimensional problems that require a collaborative methodology that involves gaining a deep understanding of humans.

□ The 1970s - Rapid prototyping

- Cognitive scientist and Nobel Prize laureate for economics, Herbert Simon, has contributed many ideas that are now regarded as tenets of Design Thinking in the 1970s.
- He is noted to have spoken of rapid prototyping and testing through observation, concepts which form the core of many design and entrepreneurial processes right now

□ The 1980s- Cross compared designers

- In 1982, Nigel Cross discussed the nature of designers problem-solving in his seminal paper Designerly ways of knowing. In his 1982 paper, Cross compared designers' problem solving to the non-design related problem solutions we develop in our everyday lives.
- Bryan Lawson, professor at the School of Architecture of the University of Sheffield, United Kingdom, also discussed the insights gathered from a series of tests which looked at the comparative methods used by scientists and architects when attempting to solve the same ambiguous problem.

➤ The 1987- Design Thinking by Peter Rowe

- Peter Rowe, then Director of Urban Design Programs at Harvard, published his book Design Thinking in 1987, which focuses on the way the architectural designer approaches his task through the lens of the inquiry

➤ The 1990s to Present

1991

IDEO (Institut Dominicain d'Etudes Orientales du Caire) was formed and showcased its design process modelled on the work developed at the Stanford Design School.

IDEO is widely accepted as one of the companies that brought Design Thinking to the mainstream; developing their own customer-friendly terminology, steps, and toolkits over the years, they have allowed those not schooled in design methodology to quickly and easily become oriented with the process.

□ The 1990s to Present

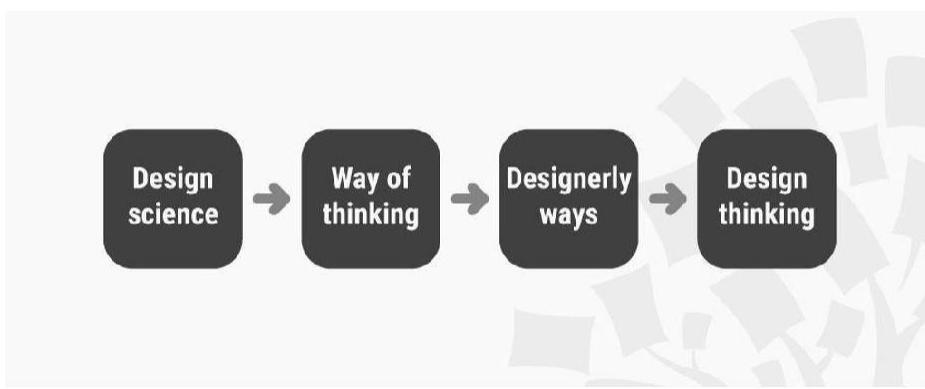
1992

- In 1992, the Head of Design at Carnegie Mellon University, Richard Buchanan, published his article, *Wicked Problems in Design Thinking*, which discussed the origins of Design Thinking.
- In the article, he discussed how the sciences developed over time from the Renaissance and formalised in the specialisations and processes they used, becoming more and more cut off from each other.

□ The 1990s to Present

2005

- Design Thinking is taught at the Stanford School of Design, or the d.school. The d.school, known today as the Hasso Plattner Institute of Design, has made the development, teaching and implementation of Design Thinking one of its own central goals since its inception.
- At present, the Design Thinking movement is gaining ground rapidly, with pioneers like IDEO and d.school formalising a path ahead for others to follow. Other prestigious universities, business schools and forward thinking companies have adopted the methodology to varying degrees, sometimes re-interpreting it to suit their specific context or brand values.



New materials (Tools in Industry)

What is Design Thinking?

Design thinking in layman's language is the best new way of organizing work. Some call it a social technology that has revolutionized how business management systems work.

What tools are used for design thinking?

Since Design Thinking owes its popularity to being customer-centric, the tools used in the process (from creating to delivering products/ services) are also life-sensitive.

1. Visualization

- Visualization is about using images. It's not about drawing; it's about visual thinking.
- It pushes us beyond using words or language alone. It is a way of unlocking a different part of our brains that allows us to think nonverbally and that managers might not normally use.
- When you explain an idea using words, the rest of us will form our own mental pictures, usually informed by our training.
- When you say, “We need a new growth platform,” the IT specialist sees servers and code and the marketing guru sees an advertising campaign. If instead you present your idea to us by drawing a picture of it, you reduce the possibility of unmatched mental models.

2. Journey mapping (or experience mapping)

- Journey mapping (or experience mapping) is an ethnographic research method that focuses on tracing the customer’s “journey” as he or she interacts with an organization while in the process of receiving a service, with special attention to emotional highs and lows.
- Experience mapping is used with the objective of identifying needs that customers are often unable to articulate.
- It’s done by laying out a hypothetical view of what a certain customer group’s journey looks like, even the part that doesn’t include your firm. Then conduct pilot interviews with a small number of customers to be sure you’re accurately capturing the steps.
- Finally, identify essential moments of truth and themes from the interviews and identify a number of dimensions that you believe to be useful in understanding the differences in the data you have gathered. The purpose is to produce a set of hypotheses for testing.

3. Value chain analysis

- Value chain analysis examines how an organization interacts with value chain partners to produce, market, and distribute new offerings.
- Analysis of the value chain offers ways to create better value for customers along the chain and uncovers important clues about partners’ capabilities and intentions.
- Value chain analysis is the business-side equivalent of customer journey mapping. It begins by working backward from value creation for the ultimate end customer and then adding the capabilities and bargaining power of other key suppliers.

4. Mind mapping

- Mind mapping is used to represent how ideas or other items are linked to a central idea and to each other. Mind maps are used to generate, visualize, structure, and classify ideas to look for patterns and insights that provide key design criteria.
- We do this by displaying the data and asking people to cluster them in ways that allow themes and patterns to emerge. To succeed, mind mapping must be a team sport.

- Tap into the power of visualization to communicate the key components of what we have learned and display them as clearly and simply as possible. Create posters that capture key themes and trends in the data, then invite a group of thoughtful people to tour the visual data and note any learnings that they believe should inform new ideas, then cluster those learnings into themes.
- Look for connections between clusters and insights. Pose the question, “Based on what we have learned, if anything were possible, what attributes would our design have?”

5. Rapid concept development

- Rapid concept development assists us in generating hypotheses about potential new business opportunities.
- In the first stage, we take the design criteria, the customer personas and their pain points and the value chain insights we have unearthed in our research and use all of it to generate new ideas — lots of them. In the second stage, we assemble the ideas into a manageable number of interesting concepts.
- Finally, in stage three, we elaborate on the business design behind that handful of concepts. We want to generate ideas quickly and get them out to customers to have a look at them as soon as possible.

6. Assumption testing

- Assumption testing focuses on identifying assumptions underlying the attractiveness of a new business idea and using available data to assess the likelihood that these assumptions will turn out to be true.
- These assumptions are then tested through thought experiments, followed by field experiments.
- Once you have determined which assumptions are most critical to the potential attractiveness of your new concept, identify the data that allows you to conclusively test key assumptions. Here, we are identifying the information we need and then figuring out how to get it.
- Sort the data you need into one of the following three categories: what you know, what you don't know and can't know, and what you don't know but could. The third category is pay dirt for the creation of thought experiments.
- Identify what it would take to get the data quickly, then design your thought experiment, paying special attention to the data that could prove you wrong.

7. Prototyping techniques

- It allow us to make abstract new ideas tangible to potential partners and customers. These include storyboarding, user scenarios, experience journeys, and business concept illustrations — all of which encourage deep involvement by important stakeholders to provide feedback.
- Prototyping is all about minimizing the “I” in ROI. The cost of a simple 2-D prototype could be as low as a pen and some paper.

- Business concept prototypes generally take visual and narrative forms: images and stories. They can even include role-playing and skits. Play with your prototype; don't defend it. Let others validate it — not the people who created it.

8. Customer co-creation

- incorporates techniques that allow managers to engage a customer while in the process of generating and developing new business ideas of mutual interest. They are among the most value-enhancing, risk-reducing approaches to growth and innovation.
- In our Six Sigma world, which values perfection and polish, we tend to get anxious about showing customers unfinished, unpolished “stuff.” Get over it.
- Innovation is about the learning, and customers have the most to teach us. The sooner we get something in front of them that they can react to, the faster we will get to a differentiated value-added solution.
- Engage a diverse and candid group of customers one at a time. Provide them with visual stimulus, but nothing fancy at this stage. Leaving parts of the concept incomplete is a great way to elicit the customers' creativity and competence. Offer two or three options and begin exploring one they are drawn to.

9. Learning launches

- They are designed to test the key underlying value-generating assumptions of a potential new-growth initiative in the marketplace. In contrast to a full new-product rollout, a learning launch is a learning experiment conducted quickly and inexpensively to gather market-driven data.
- We call them launches, rather than experiments, because they are meant to feel real to both launchers and customers. Only then can they yield reliable data. They are an extension of the co-creation process, but at this stage, we are asking customers to put their money where their mouths are. People who say they will buy remain only potential customers.
- The only true test of the value of an idea for customers is their willingness to part with cold hard cash. (For more on learning launches, please see “The Learning Launch: How to Grow Your Business With the Scientific Method.”)

10. Storytelling

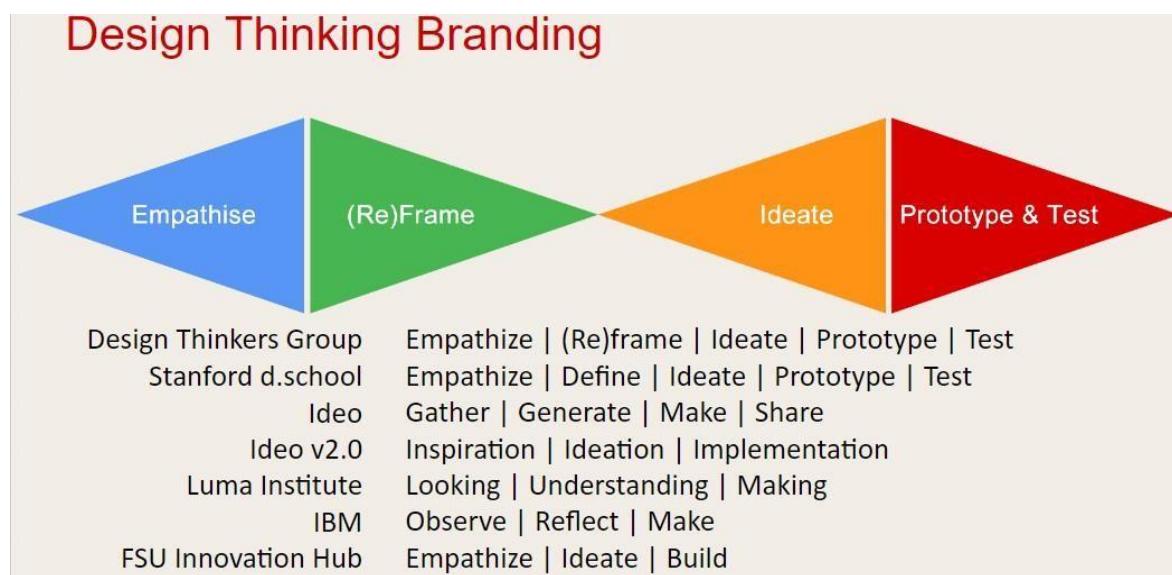
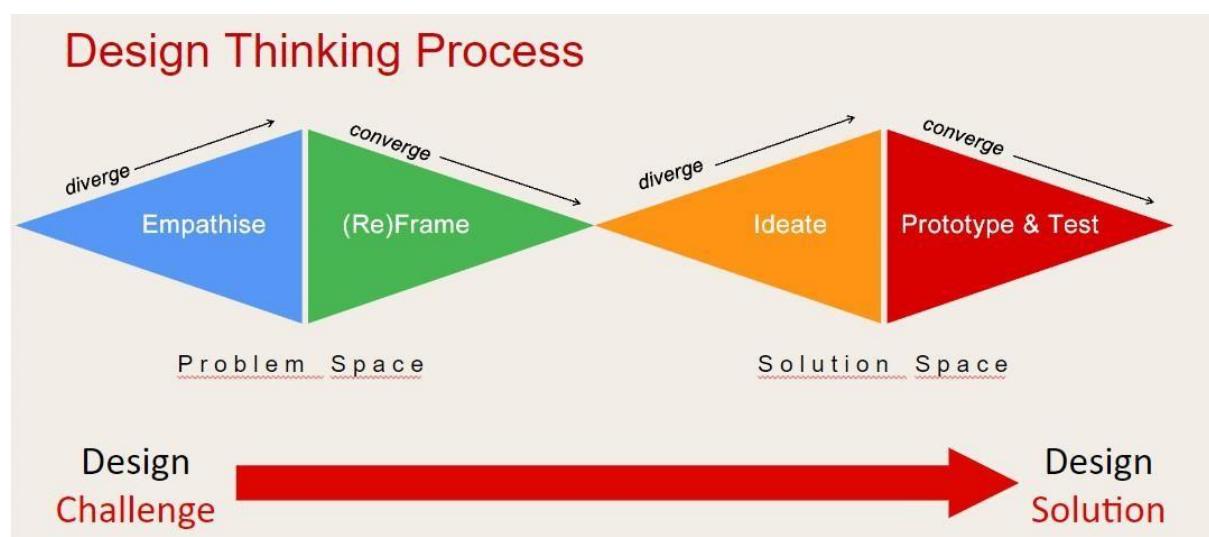
- It is exactly how it sounds: weaving together a story rather than just making a series of points. It is a close relative of visualization—another way to make new ideas feel real and compelling. Visual storytelling is actually the most compelling type of story. All good presentations—whether analytical or design-oriented — tell a persuasive story.
- Like images, stories allow us to access emotions and emphasize experiences. They add the richness of context and allow us to “sell” a problem as well as its solution. With any luck, they keep their audiences awake.
- Good stories follow some basic principles: Be sure to identify your audience. It is critical to create a storyboard; it allows us to pay careful attention to flow and logic.

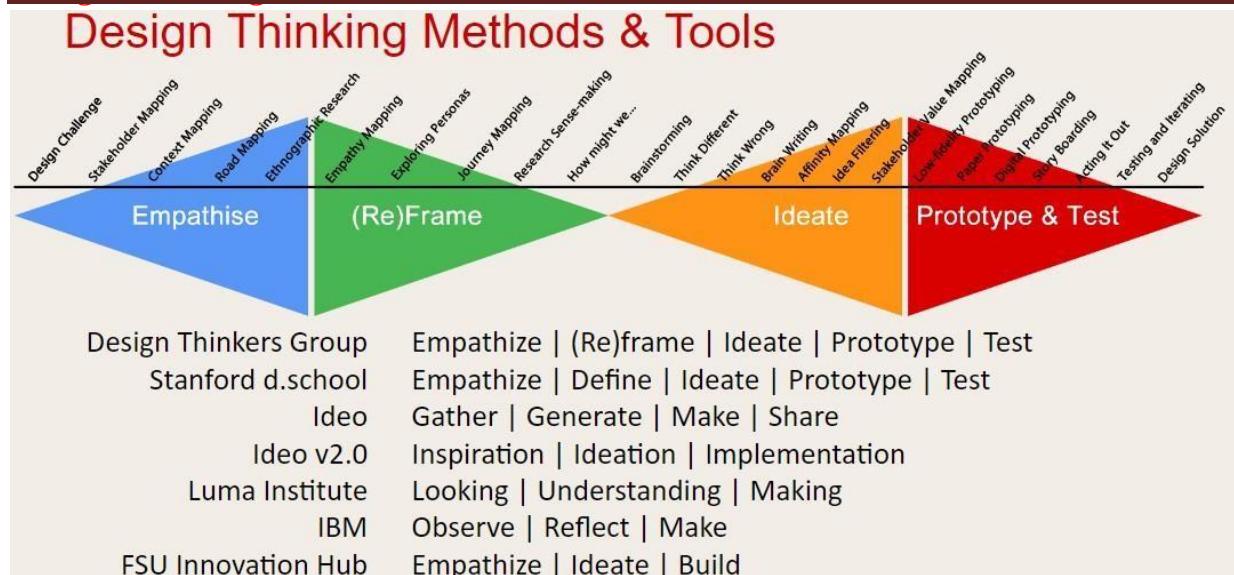
Design Thinking – U20ITT615

- Set the scene to sell the problem, make your cast of characters feel real and work the plot; all good stories unfold with some tension, and maybe some surprises develop — here is where you think about how to combine data and pictures to drive home your points.

11. Personas

- They are fictional characters, which you create based upon your research in order to represent the different user types that might use your service, product, site, or brand in a similar way.
- Creating personas helps the designer to understand users' needs, experiences, behaviors and goals. If you live on this round piece of land called Earth, you're probably tired of hearing that personas are fictional and general representations of a target audience with similar attitudes, objectives, needs, and behaviors.

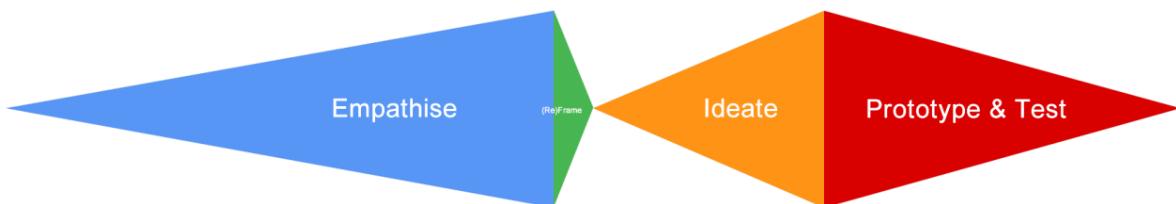




Design Thinking Steps in Perspective



Design Thinking Steps in Perspective



UNIT – II DESIGN THINKING

Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brain storming, product development.

DESIGN THINKING PROCESS:

Design thinking is a methodology which provides a solution-based approach to solving problems. It's extremely useful when used to tackle complex problems that are ill-defined or unknown—because it serves to understand the human needs involved, reframe the problem in human-centric ways, create numerous ideas in brainstorming sessions and adopt a hands-on approach to prototyping and testing. Learning about the five stages of design thinking will empower you and allow you to apply the methodology to your work and solve complex problems that occur in our companies, our countries, and across the world.

Design thinking is a non-linear, iterative process that can have anywhere from three to seven phases, depending on whom you talk to. We focus on the five-stage design thinking model proposed by the Hasso Plattner Institute of Design at Stanford (the d.school) because they are world-renowned for the way they teach and apply design thinking.

The five stages of design thinking, are:

Empathize: research your users' needs.

Define: state your users' needs and problems.

Ideate: challenge assumptions and create ideas.

Prototype: start to create solutions.

Test: try your solutions out.

Let's dive into each stage of the design thinking process.

What are the 5 Stages of the Design Thinking Process

Stage 1: Empathize—Research Your Users' Needs

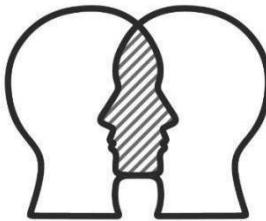
Empathize: the first phase of design thinking, where you gain real insight into users and their needs.

- The first stage of the design thinking process focuses on user-centric research. You want to gain an empathic understanding of the problem you are trying to solve. 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 problem solving and a human-centered [design process](#) as it allows design thinkers to set aside their own [assumptions](#) about the world and gain real insight into users and their needs.

Empathize



- Depending on time constraints, you will gather a substantial amount of information to use during the next stage. 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: the second phase of design thinking, where you define the problem statement in a human-centered manner.

- In the Define stage, you will organize the information you have gathered during the Empathize stage. You'll analyze your observations to define the core problems you and your team have identified up to this point. [Defining the problem](#) and problem statement must be done in a human-centered manner.
- For example, you should not define the problem as your own wish or need of the company: “We need to increase our food-product market share among young teenage girls by 5%.”
- You should pitch the problem statement from your [perception](#) of the users’ needs: “Teenage girls need to eat nutritious food in order to thrive, be healthy and grow.”
- The Define stage will help the design team collect great ideas to establish features, functions and other elements to solve the problem at hand—or, at the very least, allow real users to resolve issues themselves with minimal difficulty.
- In this stage, you will start to progress to the third stage, the [ideation](#) phase, where you ask questions to help you look for solutions: “[How might we](#) encourage teenage girls to perform an action that benefits them and also involves your company’s food-related product or service?” for instance.

Stage 3: Ideate—Challenge Assumptions and Create Ideas

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 analyzed your observations in the Define stage to create a user centric problem statement. With this solid background, you and your team members can start to look at the problem from different perspectives and ideate innovative solutions to your problem statement.
- There are hundreds of ideation techniques you can use—such as Brainstorm, Brainwrite, [Worst Possible Idea](#) and [SCAMPER](#). Brainstorm and Worst Possible Idea techniques are typically used at the start of the ideation stage to stimulate free thinking and expand the problem space.
- 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: the fourth phase of design thinking, where you 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 ideation phase. These prototypes can 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 product's limitations 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: the fifth and final phase of the design thinking process, where you test solutions to derive a deep understanding of the product and its users.

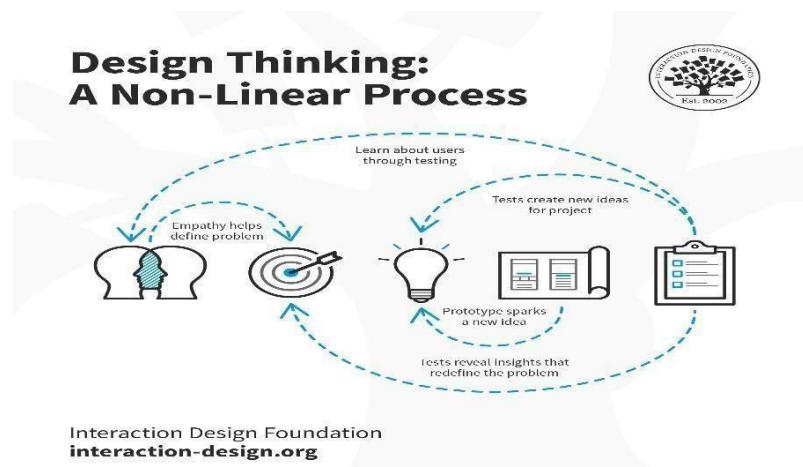
- Designers or evaluators rigorously test the complete product using the best solutions identified in the Prototype stage. This is the final stage of the five-stage model; however, in an iterative process such as design thinking, the results generated are often used to redefine one or more further problems.
- This increased level of understanding may 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 get as deep an understanding of the product and its users as possible.

Did You Know Design Thinking is a Non-Linear Process?

We've outlined a direct and linear design thinking process here, in which one stage seemingly leads to the next with a logical conclusion at [user testing](#). However, in practice, the process is carried out in a more flexible and non-linear fashion.

For example, different groups within the design team may conduct more than one stage concurrently, or designers may collect information and prototype throughout each stage of the project to bring their ideas to life and visualize the problem solutions as they go. What's more, results from the Test stage may reveal new insights about users which lead to another brainstorming session (Ideate) or the development of new prototypes (Prototype).

It is important to note the five stages of design thinking are not always sequential. They do not have to follow a specific order, and they can often occur in parallel or be repeated iteratively. The stages should be understood as different modes which contribute to the entire design project, rather than sequential steps.



The design thinking process should not be seen as a concrete and inflexible approach to design; the component stages identified should serve as a guide to the activities you carry out. The stages might be switched, conducted concurrently or repeated several times to gain the most informative insights about your users, expand the solution space and hone in on innovative solutions.

This is one of the main benefits of the five-stage model. Knowledge acquired in the latter stages of the process can inform repeats of earlier stages. Information is continually used to inform the understanding of the problem and solution spaces, and to redefine the problem itself. This creates a perpetual loop, in which the designers continue to gain new insights, develop new ways to view the product (or service) and its possible uses and develop a far more profound understanding of their real users and the problems they face.

The Take Away

Design thinking is an iterative, non-linear process which focuses on a [collaboration](#) between designers and users. It brings innovative solutions to life based on how real users think, feel and behave.

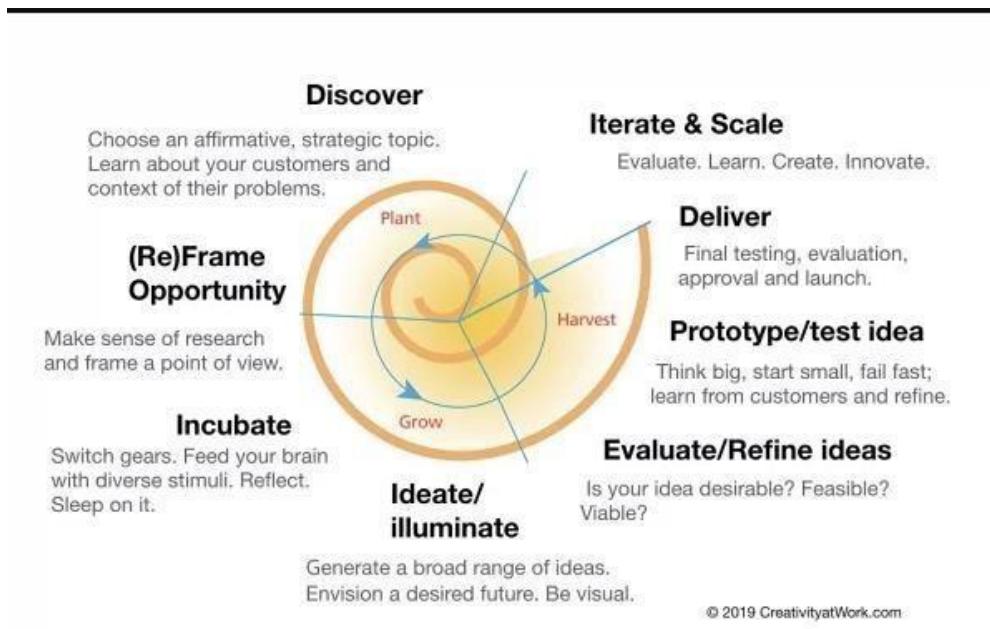
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This [human-centered design](#) process consists of five core stages Empathize, Define, Ideate, Prototype and Test.

It's important to note that these stages are a guide. The iterative, non-linear nature of design thinking means you and your design team can carry these stages out simultaneously, repeat them and even circle back to previous stages at any point in the design thinking process.

IMPLEMENTING THE PROCESS IN DRIVING INNOVATIONS

- The biggest driving force is the accelerated rate of change in business and society caused by advances in technology.
- As companies become more software-driven, and the rate of change increases, so does complexity.
- Most companies are optimised to execute and solve a stated problem. Creativity is about finding the problem worth solving.
- An absence of a scalable creative framework encourages incremental innovation in lieu of disruptive innovation. As companies strive for disruptive innovation, they must find ways to inject and scale creativity across their organizations.
- Design thinking is our best tool for sense-making, meaning making, simplifying processes, and improving customer experiences. Additionally, design thinking minimises risk, reduces costs, improves speed, and energises employees.



Four critical factors when implementing design thinking

Leadership: Link design thinking initiatives to your strategic goals. Provide direction, resources, and commitment.

People: Enable champions to lead the change through successful lighthouse projects. Build up an internal design thinking community where best practices are shared.

Process: Use the generic design thinking framework, but evolve the method and tools so they support your company's objectives.

Environment: Develop and create collaborative workspaces for your workforce. Use to co-innovate with your customers and partners.

Design thinking works because it is a collaborative co-creative process grounded in engagement, dialogue, and learning. When you involve customers and/or stakeholders in the process of defining the problem and in developing solutions, you have a much better chance of gaining commitment for change, and getting buy-in for your innovation.

FOUR STEPS TO HIGHLIGHT THE BENEFITS OF THE DESIGN THINKING TOOLS IN YOUR COMPANY

1. Focus on the problem

- Companies often fail at effectively solving problems or meeting goals because they don't correctly identify the user or problem initially. Here are a few tips for identifying your problem:
 - Listen. Put yourself in users' shoes and think through their lenses.
 - Ask questions. Who encounters this problem and why? Why did past attempts fail to solve the problem at hand?
 - Have collaborative conversations. Engage with everyone, not just those on your team.
 - Stay unbiased. Don't assume you immediately understand the problem, nor the solution. By being open-minded you might find something else you weren't expecting.

2. Develop design thinking skills on your team

- Traditionally, the ideation phase of the design thinking process was saved for project managers or engineers, but that doesn't mean it can only be used by that department or function.
 - Since design thinking is the mindset of asking questions, understanding, and testing, everyone can and should participate in this practice. Here are a few tips for developing your team's design thinking skills:
 - Practice the mindset. Start implementing the process in your role whenever you can. For example, if you oversee onboarding, think about ways you can test a new approach or

understand the new employee mentality by gathering feedback through a survey. Remain open to new outcomes.

- Foster interests in design thinking. If you have team members who want to take initiative and expand their skill sets, make sure to nurture that interest, whether it is encouraging experimentation or reimbursing costs for design thinking classes.

3. Have (or start having) more debriefs

- Design thinking is a continuous process. It's a process of iterating on previous experiments so that the product or outcome can improve and become better. However, learnings can't be implemented if there's no feedback process. Here are a few tips for creating a learning culture through gathering feedback:
- Be open about what went wrong. Set an example by demonstrating that failure is an expected part of design thinking. Openly discuss what tests failed and why.
- View failure as learning. Trying and failing a new approach serves the crucial function of narrowing down the list of possible processes. This gets you and your team closer to the approach that will work best. Encourage failure!

4. Embrace the feedback loop

- The goal of design thinking isn't perfection, but the best answer possible. And the best answer likely won't be the first answer. Thus, a constant feedback loop is essential. Here are some tips for implementing a feedback loop:
- Test and iterate as much as possible. Find new ways and angles to test your assumptions, you might come across something you would've never thought of otherwise.
- Have feedback sessions often. When you embrace feedback, not only does it create a safe space to innovate but it also prevents the same mistakes from happening again.
- The process is like a muscle that you need to build and use. With a design thinking mindset, you can spend time effectively solving the right problems and building processes that will impact your organization's success.

Design Thinking results and solutions

Design thinking is both an ideology and a process that seeks to solve complex problems in a user-centric way. It focuses on achieving practical results and solutions that are:

Technically feasible: They can be developed into functional products or processes;

Economically viable: The business can afford to implement them;

Desirable for the user: They meet a real human need.

Design Thinking - Social Innovation

- Social innovation refers to the design and implementation of new solutions that imply conceptual, process, product, or organisational change, which ultimately aim to improve the welfare and wellbeing of individuals and communities.
- Social issues are always complex problems, which have too many strands attached to them. There are too many aspects of a problem, that many a times get ignored by the social innovators.
- However, solving a social problem requires taking into consideration all the facts and figures, and then working on them.
- This is the reason why design thinking is being widely used for social innovation. As a result, non-profits have begun to use design thinking extensively these days.

IDEO Example

- In 2008, Bill and Melinda Gates Foundation asked IDEO to codify the process of design thinking. The foundation wanted the code to be used by grassroots level NGOs to solve problems for small farmers in the developing nations.
- A team from IDEO worked for months in association with the International Center for Research on Women, Heifer International, and International Development Enterprise to get insights into the process of designing new products. These products, processes, and services were to be integrated with IDEO's new process.
- As a result of this partnership program, the Human Centered Design Toolkit was developed. This methodology allowed organizations to use design thinking process themselves.

Naandi Foundation’s Example

- 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.

Design thinking in PepsiCo



PEPSICO



But why did PepsiCo choose design thinking, and what are the changes it experienced?



PepsiCo's sales rate increased when the company started addressing consumer needs

Case study - UberEATS

Problem statement: Uber wanted to find customized and affordable food delivery at the tap of a button



Prototype - Design Thinking Steps

The image shows a chalkboard with a green background and a brown border. In the top left corner, there is a blue box labeled "Example". To its right, text reads: "First version of the Apple Watch was launched in the market, i.e., in April 2015". Below this, two boxes are shown: "Smaller version" containing an icon of a watch, and "Full sized iPhone" containing an icon of a smartphone. A large orange arrow points from the watch icon to the smartphone icon. In the bottom right corner of the chalkboard, there is a small box with the text "Source: other digitals".

Design Thinking at Work

- Jerry Sternin, founder of the Positive Deviance Initiative and an associate professor at Tufts University until he died last year, was skilled at identifying what and critical of what he called outsider solutions to local problems.
- Sternin's preferred approach to social innovation is an example of design thinking in action.¹ In 1990, Sternin and his wife, Monique, were invited by the government of Vietnam to develop a model to decrease in a sustainable manner high levels of malnutrition among children in 10,000 villages.
- At the time, 65 percent of Vietnamese children under age 5 suffered from malnutrition, and most solutions relied on government and UN agencies donations of nutritional supplements. But the supplements—the outsider solution—never delivered the hoped-for results.² As an alternative, the Sternins used an approach called positive deviance, which

looks for existing solutions (hence sustainable) among individuals and families in the community who are already doing well.

- The Sternins and colleagues from Save the Children surveyed four local Quong Xuong communities in the province of Than Hoa and asked for examples of “very, very poor” families whose children were healthy. They then observed the food preparation, cooking, and serving behaviors of these six families, called “positive deviants,” and found a few consistent yet rare behaviors.
- Parents of well-nourished children collected tiny shrimps, crabs, and snails from rice paddies and added them to the food, along with the greens from sweet potatoes. Although these foods were readily available, they were typically not eaten because they were considered unsafe for children. The positive deviants also fed their children multiple smaller meals, which allowed small stomachs to hold and digest more food each day.
- The Sternins and the rest of their group worked with the positive deviants to offer cooking classes to the families of children suffering from malnutrition. By the end of the program’s first year, 80 percent of the 1,000 children enrolled in the program were adequately nourished. In addition, the effort had been replicated within 14 villages across Vietnam.⁴
- The Sternins’ work is a good example of how positive deviance and design thinking relies on local expertise to uncover local solutions. Design thinkers look for work-arounds and improvise solutions—like the shrimps, crabs, and snails—and they find ways to incorporate those into the offerings they create. They consider what we call the edges, the places where “extreme” people live differently, think differently, and consume differently.
- As Monique Sternin, now director of the Positive Deviance Initiative, explains: “Both positive deviance and design thinking are human-centered approaches. Their solutions are relevant to a unique cultural context and will not necessarily work outside that specific situation.”
- One program that might have benefited from design thinking is mosquito net distribution in Africa. The nets are well designed and when used are effective at reducing the incidence of malaria.⁵ The World Health Organization praised the nets, crediting them with significant drops in malaria deaths in children under age 5: a 51 percent decline in Ethiopia, 34 percent decline in Ghana, and 66 percent decline in Rwanda.⁶ The way that the mosquito nets have been distributed, however, has had unintended consequences. In northern Ghana, for instance, nets are provided free to pregnant women and mothers with children under age 5.
- These women can readily pick up free nets from local public hospitals. For everyone else, however, the nets are difficult to obtain. When we asked a well-educated Ghanaian named Albert, who had recently contracted malaria, whether he slept under a mosquito net, he told us no—there was no place in the city of Tamale to purchase one. Because so many people can obtain free nets, it is not profitable for shop owners to sell them. But hospitals are not equipped to sell additional nets, either.
- As Albert’s experience shows, it’s critical that the people designing a program consider not only form and function, but distribution channels as well. One could say that the free nets were never intended for people like Albert—that he was simply out of the scope of the project. But that would be missing a huge opportunity. Without considering the whole system, the nets cannot be widely distributed, which makes the eradication of malaria impossible.

The Origin of Design Thinking

- IDEO was formed in 1991 as a merger between David Kelley Design, which created Apple Computer's first mouse in 1982, and ID Two, which designed the first laptop computer, also in 1982. Initially, IDEO focused on traditional design work for business, designing products like the Palm V personal digital assistant, Oral-B toothbrushes, and Steelcase chairs. These are the types of objects that are displayed in lifestyle magazines or on pedestals in modern art museums.
- By 2001, IDEO was increasingly being asked to tackle problems that seemed far afield from traditional design. A healthcare foundation asked us to help restructure its organization, a century-old manufacturing company wanted to better understand its clients, and a university hoped to create alternative learning environments to traditional classrooms. This type of work took IDEO from designing consumer products to designing consumer experiences.
- To distinguish this new type of design work, we began referring to it as “design with a small d.” But this phrase never seemed fully satisfactory. David Kelley, also the founder of Stanford University’s Hasso Plattner Institute of Design (aka the “d.school”), remarked that every time someone asked him about design, he found himself inserting the word “thinking” to explain what it was that designers do. Eventually, the term design thinking stuck.
- As an approach, design thinking taps into capacities we all have but that are overlooked by more conventional problem-solving practices. Not only does it focus on creating products and services that are human centered, but the process itself is also deeply human. Design thinking relies on our ability to be intuitive, to recognize patterns, to construct ideas that have emotional meaning as well as being functional, and to express ourselves in media other than words or symbols. Nobody wants to run an organization on feeling, intuition, and inspiration, but an over-reliance on the rational and the analytical can be just as risky. Design thinking, the integrated approach at the core of the design process, provides a third way.
- The design thinking process is best thought of as a system of overlapping spaces rather than a sequence of orderly steps. There are three spaces to keep in mind: inspiration, ideation, and implementation. Think of inspiration as the problem or opportunity that motivates the search for solutions; ideation as the process of generating, developing, and testing ideas; and implementation as the path that leads from the project stage into people’s lives.
- The reason to call these spaces, rather than steps, is that they are not always undertaken sequentially. Projects may loop back through inspiration, ideation, and implementation more than once as the team refines its ideas and explores new directions. Not surprisingly, design thinking can feel chaotic to those doing it for the first time. But over the life of a project, participants come to see that the process makes sense and achieves results, even though its form differs from the linear, milestone-based processes that organizations typically undertake.

Inspiration

- Although it is true that designers do not always proceed through each of the three spaces in linear fashion, it is generally the case that the design process begins with the inspiration space—the problem or opportunity that motivates people to search for solutions. And the

classic starting point for the inspiration phase is the brief. The brief is a set of mental constraints that gives the project team a framework from which to begin, benchmarks by which they can measure progress, and a set of objectives to be realized—such as price point, available technology, and market segment.

- But just as a hypothesis is not the same as an algorithm, the brief is not a set of instructions or an attempt to answer the question before it has been posed. Rather, a well-constructed brief allows for serendipity, unpredictability, and the capricious whims of fate—the creative realm from which breakthrough ideas emerge. Too abstract and the brief risks leaving the project team wandering; too narrow a set of constraints almost guarantees that the outcome will be incremental and, likely, mediocre.
- Once the brief has been constructed, it is time for the design team to discover what people’s needs are. Traditional ways of doing this, such as focus groups and surveys, rarely yield important insights. In most cases, these techniques simply ask people what they want. Conventional research can be useful in pointing toward incremental improvements, but those don’t usually lead to the type of breakthroughs that leave us scratching our heads and wondering why nobody ever thought of that before.
- Henry Ford understood this when he said, “If I’d asked my customers what they wanted, they’d have said ‘a faster horse.’”⁸ Although people often can’t tell us what their needs are, their actual behaviors can provide us with invaluable clues about their range of unmet needs.
- A better starting point is for designers to go out into the world and observe the actual experiences of smallholder farmers, schoolchildren, and community health workers as they improvise their way through their daily lives. Working with local partners who serve as interpreters and cultural guides is also important, as well as having partners make introductions to communities, helping build credibility quickly and ensuring understanding. Through “homestays” and shadowing locals at their jobs and in their homes, design thinkers become embedded in the lives of the people they are designing for.
- Earlier this year, Kara Pecknold, a student at Emily Carr University of Art and Design in Vancouver, British Columbia, took an internship with a women’s cooperative in Rwanda. Her task was to develop a Web site to connect rural Rwandan weavers with the world. Pecknold soon discovered that the weavers had little or no access to computers and the Internet. Rather than ask them to maintain a Web site, she reframed the brief, broadening it to ask what services could be provided to the community to help them improve their livelihoods. Pecknold used various design thinking techniques, drawing partly from her training and partly from ideo’s Human Centered Design toolkit, to understand the women’s aspirations.
- Because Pecknold didn’t speak the women’s language, she asked them to document their lives and aspirations with a camera and draw pictures that expressed what success looked like in their community. Through these activities, the women were able to see for themselves what was important and valuable, rather than having an outsider make those assumptions for them. During the project, Pecknold also provided each participant with the equivalent of a day’s wages (500 francs, or roughly \$1) to see what each person did with the money. Doing this gave her further insight into the people’s lives and aspirations. Meanwhile, the women found that a mere 500 francs a day could be a significant, life-changing sum. This visualization process helped both Pecknold and the women prioritize their planning for the community.

Ideation

- The second space of the design thinking process is ideation. After spending time in the field observing and doing design research, a team goes through a process of synthesis in which they distill what they saw and heard into insights that can lead to solutions or opportunities for change. This approach helps multiply options to create choices and different insights about human behavior. These might be alternative visions of new product offerings, or choices among various ways of creating interactive experiences. By testing competing ideas against one another, the likelihood that the outcome will be bolder and more compelling increases.
- As Linus Pauling, scientist and two-time Nobel Prize winner, put it, “To have a good idea you must first have lots of ideas.” 10 Truly innovative ideas challenge the status quo and stand out from the crowd—they’re creatively disruptive. They provide a wholly new solution to a problem many people didn’t know they had.
- The natural tendency of most organizations is to restrict choices in favor of the obvious and the incremental. Although this tendency may be more efficient in the short run, it tends to make an organization conservative and inflexible in the long run. Divergent thinking is the route, not the obstacle, to innovation.
- To achieve divergent thinking, it is important to have a diverse group of people involved in the process. Multidisciplinary people—architects who have studied psychology, artists with MBAs, or engineers with marketing experience—often demonstrate this quality. They’re people with the capacity and the disposition for collaboration across disciplines.
- To operate within an interdisciplinary environment, an individual needs to have strengths in two dimensions—the “T-shaped” person. On the vertical axis, every member of the team needs to possess a depth of skill that allows him or her to make tangible contributions to the outcome. The top of the “T” is where the design thinker is made. It’s about empathy for people and for disciplines beyond one’s own. It tends to be expressed as openness, curiosity, optimism, a tendency toward learning through doing, and experimentation. (These are the same traits that we seek in our new hires at IDEO.)
- Interdisciplinary teams typically move into a structured brainstorming process. Taking one provocative question at a time, the group may generate hundreds of ideas ranging from the absurd to the obvious. Each idea can be written on a Post-it note and shared with the team. Visual representations of concepts are encouraged, as this generally helps others understand complex ideas.
- One rule during the brainstorming process is to defer judgment. It is important to discourage anyone taking on the often obstructive, non-generative role of devil’s advocate, as Tom Kelley explains in his book *The Ten Faces of Innovation*.¹¹ Instead, participants are encouraged to come up with as many ideas as possible. This lets the group move into a process of grouping and sorting ideas. Good ideas naturally rise to the top, whereas the bad ones drop off early on. InnoCentive provides a good example of how design thinking can result in hundreds of ideas. InnoCentive has created a Web site that allows people to post solutions to challenges that are defined by InnoCentive members, a mix of nonprofits and companies. More than 175,000 people—including scientists, engineers, and designers from around the world—have posted solutions.
- The Rockefeller Foundation has supported 10 social innovation challenges through InnoCentive and reports an 80 percent success rate in delivering effective solutions to the nonprofits posting challenges. The open innovation approach is effective in producing lots of new ideas. The responsibility for filtering through the ideas, field-testing them, iterating, and taking them to market ultimately falls to the implementer.

- An InnoCentive partnership with the Global Alliance for TB Drug Development sought a theoretical solution to simplify the current TB treatment regimen. “The process is a prime example of design thinking contributing to social innovation,” explained Dwayne Spradlin, InnoCentive’s CEO. “With the TB drug development, the winning solver was a scientist by profession, but submitted to the challenge because his mother—the sole income provider for the family—developed TB when he was 14. She had to stop working, and he took on the responsibility of working and going to school to provide for the family.” Spradlin finds that projects within the InnoCentive community often benefit from such deep and motivating connections.

Implementation

- The third space of the design thinking process is implementation, when the best ideas generated during ideation are turned into a concrete, fully conceived action plan. At the core of the implementation process is prototyping, turning ideas into actual products and services that are then tested, iterated, and refined.
- Through prototyping, the design thinking process seeks to uncover unforeseen implementation challenges and unintended consequences in order to have more reliable long-term success. Prototyping is particularly important for products and services destined for the developing world, where the lack of infrastructure, retail chains, communication networks, literacy, and other essential pieces of the system often make it difficult to design new products and services.
- Prototyping can validate a component of a device, the graphics on a screen, or a detail in the interaction between a blood donor and a Red Cross volunteer. The prototypes at this point may be expensive, complex, and even indistinguishable from the real thing. As the project nears completion and heads toward real-world implementation, prototypes will likely become more complete.
- After the prototyping process is finished and the ultimate product or service has been created, the design team helps create a communication strategy. Storytelling, particularly through multimedia, helps communicate the solution to a diverse set of stakeholders inside and outside of the organization, particularly across language and cultural barriers.
- **VisionSpring, a low-cost eye care provider in India**, provides a good example of how prototyping can be a critical step in implementation. VisionSpring, which had been selling reading glasses to adults, wanted to begin providing comprehensive eye care to children. VisionSpring’s design effort included everything other than the design of the glasses, from marketing “eye camps” through self-help groups to training teachers about the importance of eye care and transporting kids to the local eye care center.
- Working with VisionSpring, IDEO designers prototyped the eyescreening process with a group of 15 children between the ages of 8 and 12. The designers first tried to screen a young girl’s vision through traditional tests. Immediately, though, she burst into tears—the pressure of the experience was too great and the risk of failure too high. In hopes of diffusing this stressful situation, the designers asked the children’s teacher to screen the next student. Again, the child started to cry. The designers then asked the girl to screen her teacher. She took the task very seriously, while her classmates looked on enviously. Finally, the designers had the children screen each other and talk about the process. They loved playing doctor and both respected and complied with the process.
- By prototyping and creating an implementation plan to pilot and scale the project, IDEO was able to design a system for the eye screenings that worked for VisionSpring’s practitioners,

teachers, and children. As of September 2009, VisionSpring had conducted in India 10 eye camps for children, screened 3,000 children, transported 202 children to the local eye hospital, and provided glasses for the 69 children who needed them.

- “Screening and providing glasses to kids presents many unique problems, so we turned to design thinking to provide us with an appropriate structure to develop the most appropriate marketing and distribution strategy,” explained Peter Eliassen, vice president of sales and operations at VisionSpring. Eliassen added that prototyping let VisionSpring focus on the approaches that put children at ease during the screening process. “Now that we have become a design thinking organization, we continue to use prototypes to assess the feedback and viability of new market approaches .

Systemic Problems Need Systemic Solutions

- Many social enterprises already intuitively use some aspects of design thinking, but most stop short of embracing the approach as a way to move beyond today’s conventional problem solving. Certainly, there are impediments to adopting design thinking in an organization. Perhaps the approach isn’t embraced by the entire organization. Or maybe the organization resists taking a human-centered approach and fails to balance the perspectives of users, technology, and organizations.
- One of the biggest impediments to adopting design thinking is simply fear of failure. The notion that there is nothing wrong with experimentation or failure, as long as they happen early and act as a source of learning, can be difficult to accept. But a vibrant design thinking culture will encourage prototyping—quick, cheap, and dirty—as part of the creative process and not just as a way of validating finished ideas.
- As Yasmina Zaidman, director of knowledge and communications at Acumen Fund, put it, “The businesses we invest in require constant creativity and problem solving, so design thinking is a real success factor for serving the base of the economic pyramid.” Design thinking can lead to hundreds of ideas and, ultimately, real-world solutions that create better outcomes for organizations and the people they serve.

TOOLS OF DESIGN THINKING :

What is Design Thinking?

Design thinking in layman’s language is the best new way of organizing work. Some call it a social technology that has revolutionized how business management systems work.

What tools are used for design thinking?

Since Design Thinking owes its popularity to being customer-centric, the tools used in the process (from creating to delivering products/ services) are also life-sensitive.

1. Visualization

- Visualization is about using images. It’s not about drawing; it’s about visual thinking.
- It pushes us beyond using words or language alone. It is a way of unlocking a different part of our brains that allows us to think nonverbally and that managers might not normally use.

- When you explain an idea using words, the rest of us will form our own mental pictures, usually informed by our training.
- When you say, “We need a new growth platform,” the IT specialist sees servers and code and the marketing guru sees an advertising campaign. If instead you present your idea to us by drawing a picture of it, you reduce the possibility of unmatched mental models.

2. Journey mapping (or experience mapping)

- Journey mapping (or experience mapping) is an ethnographic research method that focuses on tracing the customer’s “journey” as he or she interacts with an organization while in the process of receiving a service, with special attention to emotional highs and lows.
- Experience mapping is used with the objective of identifying needs that customers are often unable to articulate.
- It’s done by laying out a hypothetical view of what a certain customer group’s journey looks like, even the part that doesn’t include your firm. Then conduct pilot interviews with a small number of customers to be sure you’re accurately capturing the steps.
- Finally, identify essential moments of truth and themes from the interviews and identify a number of dimensions that you believe to be useful in understanding the differences in the data you have gathered. The purpose is to produce a set of hypotheses for testing.

3. Value chain analysis

- Value chain analysis examines how an organization interacts with value chain partners to produce, market, and distribute new offerings.
- Analysis of the value chain offers ways to create better value for customers along the chain and uncovers important clues about partners’ capabilities and intentions.
- Value chain analysis is the business-side equivalent of customer journey mapping. It begins by working backward from value creation for the ultimate end customer and then adding the capabilities and bargaining power of other key suppliers.

4. Mind mapping

- Mind mapping is used to represent how ideas or other items are linked to a central idea and to each other. Mind maps are used to generate, visualize, structure, and classify ideas to look for patterns and insights that provide key design criteria.
- We do this by displaying the data and asking people to cluster them in ways that allow themes and patterns to emerge. To succeed, mind mapping must be a team sport.
- Tap into the power of visualization to communicate the key components of what we have learned and display them as clearly and simply as possible. Create posters that capture key themes and trends in the data, then invite a group of thoughtful people to tour the visual data and note any learnings that they believe should inform new ideas, then cluster those learnings into themes.

- Look for connections between clusters and insights. Pose the question, “Based on what we have learned, if anything were possible, what attributes would our design have?”

5. Rapid concept development

- Rapid concept development assists us in generating hypotheses about potential new business opportunities.
- In the first stage, we take the design criteria, the customer personas and their pain points and the value chain insights we have unearthed in our research and use all of it to generate new ideas — lots of them. In the second stage, we assemble the ideas into a manageable number of interesting concepts.
- Finally, in stage three, we elaborate on the business design behind that handful of concepts. We want to generate ideas quickly and get them out to customers to have a look at them as soon as possible.

6. Assumption testing

- Assumption testing focuses on identifying assumptions underlying the attractiveness of a new business idea and using available data to assess the likelihood that these assumptions will turn out to be true.
- These assumptions are then tested through thought experiments, followed by field experiments.
- Once you have determined which assumptions are most critical to the potential attractiveness of your new concept, identify the data that allows you to conclusively test key assumptions. Here, we are identifying the information we need and then figuring out how to get it.
- Sort the data you need into one of the following three categories: what you know, what you don't know and can't know, and what you don't know but could. The third category is pay dirt for the creation of thought experiments.
- Identify what it would take to get the data quickly, then design your thought experiment, paying special attention to the data that could prove you wrong.

7. Prototyping techniques

- It allows us to make abstract new ideas tangible to potential partners and customers. These include storyboarding, user scenarios, experience journeys, and business concept illustrations — all of which encourage deep involvement by important stakeholders to provide feedback.
- Prototyping is all about minimizing the “I” in ROI. The cost of a simple 2-D prototype could be as low as a pen and some paper.
- Business concept prototypes generally take visual and narrative forms: images and stories. They can even include role-playing and skits. Play with your prototype; don't defend it. Let others validate it — not the people who created it.

8. Customer co-creation

- incorporates techniques that allow managers to engage a customer while in the process of generating and developing new business ideas of mutual interest. They are among the most value-enhancing, risk-reducing approaches to growth and innovation.
- In our Six Sigma world, which values perfection and polish, we tend to get anxious about showing customers unfinished, unpolished “stuff.” Get over it.
- Innovation is about the learning, and customers have the most to teach us. The sooner we get something in front of them that they can react to, the faster we will get to a differentiated value-added solution.
- Engage a diverse and candid group of customers one at a time. Provide them with visual stimulus, but nothing fancy at this stage. Leaving parts of the concept incomplete is a great way to elicit the customers’ creativity and competence. Offer two or three options and begin exploring one they are drawn to.

9. Learning launches

- They are designed to test the key underlying value-generating assumptions of a potential new-growth initiative in the marketplace. In contrast to a full new-product rollout, a learning launch is a learning experiment conducted quickly and inexpensively to gather market-driven data.
- We call them launches, rather than experiments, because they are meant to feel real to both launchers and customers. Only then can they yield reliable data. They are an extension of the co-creation process, but at this stage, we are asking customers to put their money where their mouths are. People who say they will buy remain only potential customers.
- The only true test of the value of an idea for customers is their willingness to part with cold hard cash. (For more on learning launches, please see “The Learning Launch: How to Grow Your Business With the Scientific Method.”)

10. Storytelling

- It is exactly how it sounds: weaving together a story rather than just making a series of points. It is a close relative of visualization—another way to make new ideas feel real and compelling. Visual storytelling is actually the most compelling type of story. All good presentations—whether analytical or design-oriented — tell a persuasive story.
- Like images, stories allow us to access emotions and emphasize experiences. They add the richness of context and allow us to “sell” a problem as well as its solution. With any luck, they keep their audiences awake.
- Good stories follow some basic principles: Be sure to identify your audience. It is critical to create a storyboard; it allows us to pay careful attention to flow and logic.
- Set the scene to sell the problem, make your cast of characters feel real and work the plot; all good stories unfold with some tension, and maybe some surprises develop — here is where you think about how to combine data and pictures to drive home your points. For the climax, unveil your resolution to the problem. Make it compelling. And don’t forget the use of metaphors and analogies to bring your story to life!

11. **Personas** are fictional characters, which you create based upon your research in order to represent the different user types that might use your service, product, site, or brand in a similar way. Creating personas helps the designer to understand users' needs, experiences, behaviors and goals. If you live on this round piece of land called Earth, you're probably tired of hearing that personas are fictional and general representations of a target audience with similar attitudes, objectives, needs, and behaviors.

WHAT IS THE DESIGN THINKING PROCESS GOOD FOR?

- Design Thinking is not just the preserve of tech organizations – any company that has customers or users can benefit from using a design thinking process to approach business challenges.
- The Design Thinking process is great for solving complex problems and delivering solutions that directly target the way your users interact with your product or company.
- Simply put – Design Thinking is especially effective in enabling a company to truly understand its users and create solutions based on the needs and challenges of those people.
- The success of any organization is largely predicated on those people using the product or service it provides. By developing solutions with those people in mind, your team can create targeted solutions that can have a massive effect on user activation, retention, and growth.
- The out of the box mindset that the Design Thinking process enables is also good for helping figure out new solutions to recurring problems where other attempts have failed.

HOW TO APPLY DESIGN THINKING AT WORK?

There are four steps you can take to apply design thinking at your company or with your team.

Put on your journalist hats. A good journalist knows how to effectively listen, ask the right questions, and stay unbiased. With this mindset, have conversations with everyone, not just those on your team or direct reports. In this way, you can discover the true problem or question that needs to be solved.

Encourage education and practice. Implement small tasks throughout the day that incorporate design thinking skills. Sign your team members up for design thinking courses. Regularly ask your team if they notice a project or process where they want to try out design thinking.

Set expectations for feedback loops. Your team should know that you will be testing and iterating as much as possible. Feedback is an important part of this process that should be expected and embraced.

Be honest and open about mistakes. During your many feedback sessions, you'll inevitably need to be honest about what went wrong. Encourage and celebrate failures. Emphasize that failure leads to learning which leads to better solutions.

Design thinking is responsible for improving or developing new businesses, products, and services. Great design thinkers have a bias toward action. When you apply these four actionable steps to your team, design thinking works to change people's lives for the better.

BENEFITS OF DESIGN THINKING VS. TRADITIONAL PROBLEM-SOLVING

Design thinking is a mindset you and your team can adopt during brainstorming sessions. According to IDEO, the more frequently that teams brainstorm, the more likely they are to achieve their objectives. When you implement design thinking, it helps you take something ambiguous (like a complex problem) and provide a clear and simple process to get to a solution.

WHAT ARE THE 5 CORE DESIGN PRINCIPLES?

However, depending on your project, it can be helpful to know some design principles for when you are in the ideate and prototype phases. They are as follows:

- **Balance:** Makes the design visually appealing. The visual weight of a design needs symmetrical, asymmetrical, or radical balance.
- **Alignment:** Gives a sense of order and direction for the viewer or user to navigate the page, product, or design.
- **Proximity:** Communicates a message about the elements in view. A close proximity suggests relatedness or connection, while a far one does the opposite.
- **Repetition:** Produces a feeling of organization and consistency that the viewer or user can depend on.
- **Contrast:** Makes the image, element, or product “pop” by setting it apart from the rest of the design, which keeps things interesting and draws attention to the right place.

UNIT – III INNOVATION AND PRODUCT DESIGN

Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations. Creativity to Innovation. Teams for innovation, Measuring the impact and value of creativity. Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications

INNOVATION

Innovation - Doing new things,



Innovation is about creating value and increasing efficiency, and therefore growing your business. “Without innovation, new products, new services, and new ways of doing business would never emerge, and most organizations would be forever stuck doing the same old things the same old way.”



10 Things To Learn From Guy Kawasaki

- Make meaning, not money
- Make a mantra, not mission
- Jump to the next curve
- Roll the dice
- Don't worry, be crappy
- Let 100 flowers bloom
- Polarize people
- Churn baby, churn
- Niche Thyself
- Don't let the bozos grind you down

Make Meaning, Not Money

- Innovation is about offering value and changing the world.
- If you innovate to bring a difference in people's lives, the money will follow eventually. But money shouldn't be your first agenda.
- When I shared this modified version in our next zoom meeting, everybody said 'yes, this is what all our clients would want.'

Make A Mantra, Not Mission

- Because according to Guy, your meaning leads to a mantra. And the mantra is the crux of the difference you want to make.
- Chuck your 50-word mission statement. Stick to a 2-3 word mantra that represents your aim of the innovation.
- I realized that if we can narrow down our vision to 2-3 words, this can make our path more clear. Guy gave an example where he says to learn from FedEx: '**Peace of mind**' whenever and wherever you go because FedEx is at your service

Jump To The Next Curve

- Don't stick to achieving 10% better from your current innovation.
- Create something new instead of continuously working on the existing product.
- Don't limit yourself and stick to the same curve. Move to the next one.

Roll The DICEE

- **Deep** – The features and functionalities of great innovation are deep.
- **Intelligent** – At the same time, great innovation is intelligent. Ford's MyKey can control the top speed of the car through the key. Quite smart!

- **Complete** – You can differentiate great products from mediocre by their totality, their completeness.
- **Empowering** – Innovations that enhance your life and way of working are empowering products. They have the capability to change your life.
- **Elegance** – An innovation offers a great design and user experience.

Don't Worry, Be Crappy

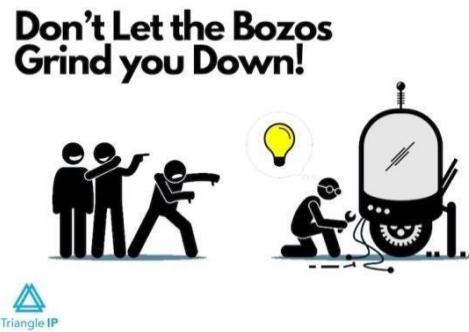
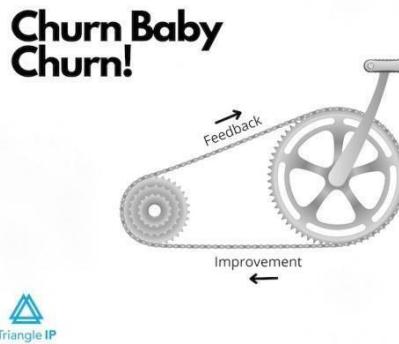
- Don't wait for perfection when you innovate. A valuable innovation can have elements of crappiness, Guy suggests.
- So, don't worry about the flaws. Instead, ship your innovation with revolutionary outcomes. If it's on the next curve, elements of crappiness don't matter.
- Guy shares an excellent example where he tells a story of John Logie Baird who introduced the first TV set in 1926, it wasn't a flat-screen, and rightfully so. The set was a mechanical version to transmit pictures without a film. The images were of low quality, but the invention paved the way for electronic TV.
- Had Braid worried too much about the existing flaws, he wouldn't have been voted the second most famous Scottish scientist.

Let 100 Flowers Blossom

- Your product may solve a particular problem. And you may have a specific audience in mind. Later, your product could be used & perceived in a new way by people you had never thought of.
- When Apple launched Macintosh, they aimed it as offering database, word processing, and spreadsheet. But Macintosh became synonymous with desktop publishing.
- The positioning of your innovation ultimately comes down to what consumers decide. But don't worry about that. Allow a hundred flowers to bloom from one seed and cherish a garden.

Polarize People

- Be ready to polarize people with your innovations. **Who says a great innovation doesn't have critics?** Your innovation might make only a small segment of people happy.
- Apple is a typical example. Those who don't use an iPhone criticize it for its cost and niche features. But only an apple user has the heart to shell out what they pay for.
- So, don't worry if your innovation draws negative attention. **Worry if people are indifferent about it.**



Churn Baby, Churn

- When you ship your product with a bit of crappiness, you have a scope to improve. Make new versions of your innovation, and then create another better version. Keep evolving to make a great product.
- “**Innovation is not an event; it’s a process,**” quotes Kawasaki.
- Facebook didn’t become the most loved social media platform on its first day. With time it evolved and became what it is today. After all, Rome was not built in a day.

Don’t Let The Bozos Grind You Down

- Naysayers will interrupt and criticize. Don’t let bozos bog down your spirits.
- Bozos are either the losers themselves or the rich and famous people you might perceive as correct in negating your meaning and mantra. **They are still stuck in their curves and don’t appreciate the next curve you are standing at.**
- And here is your bonus tip Guy Kawasaki advises every innovator.

Perfect your Pitch

- After your innovation, the challenge of pitching your product looms around. Guy suggests following the **10-20-30** rule of pitching.
- Have 10 slides to proposition your product. Explain these slides in 20 minutes and use 30 points fonts. With these fonts and 10 slides, you are bound to explain your innovation **succinctly**—need of the time.

CREATIVITY

- Creativity is the act of turning new and imaginative ideas into reality.
- **Creativity** is defined as the tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems

IMPORTANCE OF CREATIVITY

Creativity helps you see the big picture

- Being able to see the big picture is important in many areas of life. Whether it’s your personal life or a work project, it’s easy to get bogged down and lost in the details.

- Being creative and letting your mind meander a bit is like taking a walk in the forest. Rather than stopping to focus on one piece of moss, keep wandering down the path and open up the forest. You're able to see past the trees, in a way.

Creativity helps with problem-solving

- When you're trying to find the solution to a problem, thinking creatively opens up the possibilities. You look at the situation from different angles.
- Oftentimes, people get stuck on solutions that they've always used in the past. While it might still get the job done, it could be done better if it was more creative. That's how we get unique ideas and how innovators set themselves apart.



Creativity can make you more productive

- Creative people have open, active minds. They're usually buzzing with ideas and soaking up inspiration from the world around them. This often makes them more productive because they're bringing more to the table than someone who doesn't open their mind to what's around them.
- Creative people are always looking for new ways to solve problems, as well, which sparks innovation and increased efficiency. It's a valued skill in any field.

Creativity boosts your confidence

- Being creative helps you see the big picture, stay motivated, and solve problems. What could be more confidence-boosting than that?
- When you think creatively and overcome all kinds of challenges, you're proving to yourself that you're a capable person. Very few good things in life come without some effort. On the way, creativity makes that process more engaging as well as rewarding.

Creativity helps clarify your thoughts and feelings

- The mind can be a chaotic place. It can feel like you're chasing one thought or feeling after another like a dog chasing every car he sees. Traditional ways of outlining your thoughts and feelings are often too linear and don't encompass what's going on.

- More creative ways like journaling, mind-mapping, and even drawing let you release the contents of your mind without restrictions. When you don't judge yourself and let your thoughts and feelings run free, you'll get more clarity on them. The process of putting them out in a creative way makes them more real and solid.

Creativity brings people together

- Being creative can be a solitary, personal experience, but it can also be community-driven.
- [Art](#) classes, craft groups, bands, and so on are all collectives of creative people coming together to do what they love. These connections are incredibly valuable for a person's mental health.



Creativity relieves stress

- [Research](#) shows that being creative relieves stress. This is important because stress is like poison to humans.
- Stress can cause a wide variety of health problems, some of them serious, and significantly affect our [happiness](#). Being creative is like a smoothing balm. It can increase positive thoughts and feelings of peace.

Creativity can help you live longer

- Did you know being creative can extend your life? In a study published by Scientific American Magazine, researchers showed that creativity exercises a handful of neural networks in the brain.
- By keeping your mind active, you're essentially working out the brain muscle. Like all exercise, this keeps you healthier, so you live longer than someone who doesn't use these networks.
- The fact that creativity also relieves stress most likely plays a role in extending a person's life.

Basic Element of The Creative Process:

The process of creating new venture is inherently to be dynamic and versatile. There are some aspects to be taken and the stages of creative approach.

Below show some insight of explanation on the creative process:

Step 1: Preparation Preparation is a basic step need to be taking care off. It is a process to prepare your mind to be in creative thinking. The basic starts is identify a problem and look out for related information.

Get your mind ready by study and research more on the field of expertise. Take more time to involve in professional or trade association to gain more experience and knowledge.

Step 2: Thinking the unthinkable In this step required entrepreneur to go beyond the comfort zone. The phrase thinking outside the box often be used to create the creative problem solution and expression that has been used in psychology, business and marketing.

Step 3: Creativity Isn't Magic Creativity is the ability to generate, reapplying, changing or combining between new and existing ideas. The simplest way to obtain new idea is by combining the ideas and existing elements.

Step 4: Incubation In this stage involve a lot of works in order to achieve the main goal that is to find a solution. By evaluating the existing project can help to generate potential idea.

Step 5: Illumination In this stage, ideas that generate from incubation stage need to be clarified. Now the creativity process leads to the knowledge of some practical ideas that can be put to work.

Step 6: Verification This stage is to validate the idea accurate and useful. The idea will be determine either it is potential to solve a problem or not. The idea may be rejected, accepted, modified with minor or major changes. If the idea is rejected, the whole processes need to start again.

Roles of Creativity and Innovation in Entrepreneurship Creativity and innovation in entrepreneurship link by which creativity is the intellectual activity to create new ideas while innovation is the action taken to transform the new ideas into a result.

Why is creativity important in business?

- Creativity and innovation within a well-run companies have always been recognized as a sure path to success. Stimulating creativity and exploring completely new and unknown before territories lead as result to increasing the productivity of the organisation. Encouraging the employees to think outside of the box and giving them time and resources to explore new areas for innovative ideas is the key to cost-effective business solutions.
- Creativity improves the process of solving problems. It doesn't matter if we're talking about developing a new strategy or an innovative way to stay ahead of the competition. Creative problem solving gives that competitive edge that any business is striving to achieve.
- Creative ideas and innovative approaches can come from almost anywhere- from your partners, customers, target groups, employees. They can bring you fresh perspectives and ideas, so show them that you're listening and open to their feedback. That's why it is important an open exchange of ideas to be supported and encouraged by the company.

I. Creativity boosts business reputation.

In competitive market nowadays, entrepreneurs with same feature of product selling need to find the different and appealing to attract customers. The product and services for certain business should be able to distinguish. Creative entrepreneurs must be able to value add the speciality in their product and services. The specialities could attract customer and remarkable. However, to keep the reputation run for long time creativity need to innovate from time to time without losing its touch and originality.

II Creativity source of business survival

Competitive market nowadays required entrepreneur to be creative for not left behind. It is essential for business environment to compete in an increasingly challenging world at the moment. The values of creativity is vital for competitors who constantly producing innovative products or services accordance with the current development. As people nowadays are demand for changing, the pattern of customers to some extent slightly changes. Take for example, grocery shopping. Some of the enterprise has made it easy and creative for the customer to do their grocery shopping. One of the ways is through online shopping and the groceries will deliver right to their home. This kind of creativity lead the entrepreneur to be known and stay survive in tough competitive.

III. Creativity spurs to entrepreneurial quality

The advantage by taking creativity as priority leads the entrepreneurial towards better quality. Creativity required one's to solve the problem occur and need to come with relevant and reliable solution. Entrepreneur need to think out of box to enhance the entrepreneurial qualities.

IV. Creating new ideas for competitive advantages

The whole process of entrepreneurship itself rooted in creation and exploration of creating and explores new ideas. Creative entrepreneur creates new products for existing services and product.

V. Thinking of novel ways to develop your product and improve the business

There is always an opportunity for improvement in the deliverables of an enterprise. Creativity and innovation helps develop new ways of improving an existing product or service to optimize the business. This also allows entrepreneurs to think outside the box and beyond the traditional solutions. Through this opportunity new, interesting, potential yet versatile idea come up.

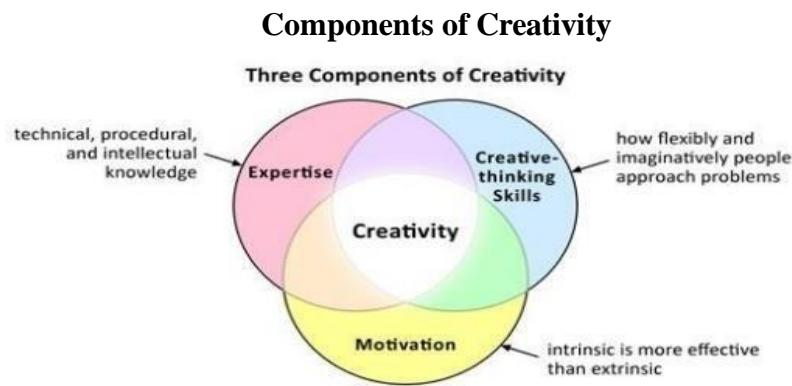
VI. Finding similar patterns in different areas

Creative people would sometime able to connect dissimilar and unrelated subject and make successful entrepreneurial ideas. Interesting ideas could come from colliding different fields. VII. Creativity is problem solving In developing new strategies to keep the business running competitively, creative problem solving provides a competitive advantage that every business wants to achieve. The need for creative problem solving arises because more management needs critical insight to find a suitable and viable solution whenever it happens.

Creativity

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Creativity is a key ingredient in every innovation process. Many companies tend to confuse creative processes with the implementation of disorganized techniques to generate group ideas and that is why they tend to fail.



- Divergent and convergent thinking are the most common ways to foster more creative thought.
- Divergent thinking is like a traditional brainstorming session, where you come up with as many possible solutions as your imagination will allow.
- Meanwhile, convergent thinking takes a more logical approach, encouraging you to gather facts and discover the most common solution to a problem. These strategies are frequently used together to conjure new creative solutions.
- inspirational thinking focuses on imagining the best-case scenarios to find a new way to solve a problem, while lateral thinking involves letting ideas flow in a step-by-step format.
- Aesthetic thinking focuses on reframing the problem to see its inherent beauty and

What is Innovation

- Innovation generally refers to changing processes or creating more effective processes,
products and ideas.

- Being innovative does not only mean inventing. Innovation can mean changing your business model and adapting to changes in your environment to deliver better products or services.
- Successful innovation should be an in-built part of your business strategy, where you create a culture of innovation and lead the way in innovative thinking and creative problem solving.
- Innovation can increase the likelihood of your business succeeding. Businesses that innovate create more efficient work processes and have better productivity and performance.

Process of Innovation

- Idea Generation (Making)
- Idea Screening (test)
- Feasibility (Practically)
- Implementation (Completion)

Over time, an innovation may be improved. This improvement is called an innovation. Because of innovations, technological devices used today are smaller, cheaper, and more powerful than the first models developed by inventors. We spend less time than our ancestors did on tasks such as cleaning and cooking. The innovations of technology have changed our daily lives dramatically. Technology has become much more portable.

Types of Innovation:

- (i) Technical,
- (ii) Process and
- (iii) Administrative.

Technical Innovation

- Technical Innovation involves creation of new goods and services.
- Many technical innovations occur through research and development efforts intended to satisfy demanding customers who are always seeking, new,better, faster and/or cheaper products.
- Through this innovation, its leads to increases in effective demand which encourages increases in investment and employment.

Process Innovation

- Process Innovation involves creating a new way of producing, selling or distributing an existing good or service.
- which includes change and improvement to methods. These contribute to increase in activity and by which lower cost and help to increase demand.

Administrative innovation

- Administrative innovation occurs when creation of a new organisation design better supports the creation, production and delivery of goods and services.
- This innovation require the organization take part equally and joining to generate viable and potential idea to become more competitive.

Need of Innovation

- For economic growth
- For the progression of human well-being
- For competitive advantage
- Because cost-cutting is not enough anymore
- Desire for higher business revenues
- To improve disappointing performance
- To take advantage of opportunity
- For a more constant flow of innovation
- For better returns
- For business survival

Difference between invention, innovation and creativity

S.no	creativity	invention	innovation
1	creativity is novel ideas that are communicated, useful, and appealing.	Creating something new ⁴	Making the invention into a product form
2	creativity is a fuzzy idea and can't be clarified until it is made into a prototype ²	A new to the world discovered or created	innovation is about changing a pattern ² for doing something.
3	Ideas	Cash → ideas ⁵	Ideas → cash
4	Based on thinking up new things ⁷	Based on primary scientific skills	Based on broad set of strategic, marketing and technical skills. ⁶

The Importance of creativity in Innovation



Role of Innovation and Creativity Industry and Organizations

Innovation is the process of creating and implementing a new idea. It is the process of taking useful ideas and converting them into useful products; services or processes or methods of operation.

Creativity in the ability to combine ideas in a unique way or to make useful association among ideas. Creativity provides new ideas for quality improvement in organizations and innovation puts these ideas into action.

Strategic Importance of Innovation:

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- For both established organisations as well as new organisations, innovation and change become important in a dynamic, changing environment. When a company fails to innovate and change as needed, its customers, employees and the community at large can all suffer. The ability to manage innovation and change is an essential part of a manager's competencies.
- Creative ideas and innovative approaches can come from almost anywhere- from your partners, customers, target groups, employees. They can bring you fresh perspectives and ideas, so show them that you're listening and open to their feedback. That's why it is important an open exchange of ideas to be supported and encouraged by the company.

Create a Creative Workplace

- Creative thinking can also lead to innovation that will grow your business through increased productivity. When you "focus on what things you can streamline and what things you need to cut out" while keeping the systems that perform well, you'll build a simpler, more efficient workplace. Creative thinking lets you come up with ideas that will excite and motivate your team.

Reach New Heights

- Creativity and innovation can be the pathways for your business to reach new heights of product value, process improvement, productivity, marketing success, and internal harmony. The creative process can lead to novel ideas and concepts.
- This is especially true when the divergent thinking it requires is complemented by conventional convergent thought. When a diverse, cross-functional team looks to innovate through implementation of creative ideas, they'll work more effectively, flexibly, and with a greater sense of unity.
- From product designs that are miles ahead of the competition to minor office changes, any new improvement to your business is an innovation. This process doesn't happen just once, either.

Creativity importance

Creativity goes hand in hand with innovation. And there is no innovation without creativity. While creativity is the ability to produce new and unique ideas, innovation is the implementation of that creativity - that's the introduction of a new idea, solution, process, or product.

Creativity is the driving force behind innovation and the incorporation of looking at things from a different perspective and freedom of restrictions by rules and written or unwritten norms.

From Creativity to Innovation

Design thinking provides the **methodology and tools** to move from creative ideation to innovative outcomes. Here's how the transition happens:

1. Empathy Phase: Setting the Foundation for Creativity

- Creativity begins with understanding user needs, emotions, and experiences through tools like:
 - User interviews.
 - Observation and empathy mapping.
- Creativity manifests as team members identify hidden or unarticulated needs.

2. Define Phase: Shaping Creative Insights into a Problem Statement

- Creative synthesis of data into actionable problem definitions (e.g., **How Might We** questions).
- Example: Turning feedback like “I hate waiting in queues” into the challenge: *“How might we reduce wait times for customers?”*

3. Ideation Phase: The Creative Core

- Focus entirely on generating as many ideas as possible to solve the defined problem.
- Techniques used in this phase include:
 - Brainstorming.
 - Mind mapping.
 - SCAMPER (Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, Reverse).
- Creativity is unconstrained, encouraging innovative and even unconventional suggestions.

4. Prototype Phase: Applying Innovation

- Creativity transitions into innovation as the best ideas are developed into **tangible models** or **prototypes**.
- Prototypes are simple, cost-effective representations of ideas that can be tested and improved.
- Example: A team brainstorming a new app might create paper sketches or low-fidelity wireframes to visualize the concept.

5. Testing Phase: Innovating for Practical Use

- Innovation takes center stage during testing, as prototypes are evaluated by real users.
- User feedback ensures solutions are functional, practical, and aligned with their needs.
- Iterative improvement is critical, ensuring the creative idea evolves into a market-ready innovation.

TEAM FOR INNOVATION:

How to build an innovative team

Few steps and considerations to make when building that team:

Step 1: Define Your Innovation Strategy

Step 2: Recruitment

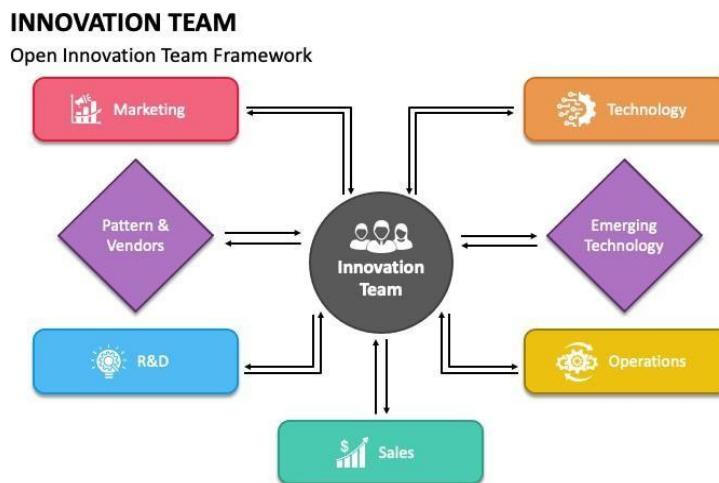
Step 3: Setting the Mission

Step 4: Encourage Education

Step 5: Establish Key Performance Indicators

Managing Innovative Teams

- Shield your team from as much administrative work as possible
- Train your team in creative problem-solving techniques
- Allow time for new ideas to emerge
- Avoid micro-managing your team
- Stress open communication
- Issue escalation is a powerful tool
- Promote interdisciplinary collaboration
- Challenge your team
- Tolerate risk-taking & failure



The best innovation teams tend to have the same traits:

1. Technical skill and the ability to think creatively and critically.
2. Diversity of thought and background.

3. The ability to really focus on the innovation project.

4. The freedom to fail.

5. Ample funding.

6. Their own physical space.

7. A mix of internal and external people.

8. Freedom to challenge the status quo.

9. They have clear, reasonable milestones and timelines.

1. Technical skill and the ability to think creatively and critically.

- The mindsets and perspectives of the people you insert into an innovation team are equally if not more important than their technical abilities. In other words, it's not just about what someone can do, but how they think.
- Creative, outside-the-box thinkers are a vital component of every great innovation team. After all, innovation is a creative process, first and foremost.

2. Diversity of thought and background.

- The best innovation teams have people with various skillsets and backgrounds who think and approach things differently. This is often referred to as cross-functionality.
- A cross-functional team features someone from marketing, someone from product, someone from finance, someone from operations, etc. That way, the team can create a holistic picture of how to bring an idea to fruition.

3. The ability to really focus on the innovation project.

- When innovation teams are distracted by other responsibilities, innovation suffocates.
- We once worked with a client whose innovation team members were still expected to work 40 hours a week in their primary roles. The innovation project was entirely separate. Of course, they just couldn't invest the necessary time. And they seemed frazzled and unable to clearly think through ideas because they were burnt out by the time they got to us.
- Innovation teams can't be tied to the existing organization in a way that keeps them from being able to think outside the box.

4. The freedom to fail.

- Innovation teams shouldn't be expected to play it safe.
- Expectations—and with them, compensation and incentives—should be set up to allow for failure.
- Innovation is an imperfect, no-guarantees endeavor. Innovation teams must be able to test out different ideas and go right back to the drawing board unfazed and without the fear of losing their job when something doesn't work out. That's all part of the process.

5. Ample funding.

- The later stages of the process, when you actually execute on ideas, are costly. But remember this, too: Innovation is a gamble.
- While you need to invest a healthy budget, you also need to be willing to see it produce nothing but a learning experience if things don't pan out.

6. Their own physical space.

- Something interesting happens when you put people in a new space: They think differently. And thinking differently is great for innovation.
- Ideally, an innovation team should be placed in a brand-new environment—this provides a new lens. It shakes up the Etch-A-Sketch. I've found that if an innovation team is sent to work in the conference room or at the same desks they sit at every day, they struggle.

7. A mix of internal and external people.

- People from inside an organization have valuable knowledge about the organization's existing capabilities.
- Folks from the outside bring fresh perspectives and creative thinking. It takes both to develop new ideas, optimize processes, and execute.

8. Freedom to challenge the status quo.

- An innovation team needs to be able to challenge existing products and processes—and even potentially cannibalize the existing business—with the fear of backlash.

9. They have clear, reasonable milestones and timelines.

- An innovation team should always have a clear beginning, middle, and end in mind when starting a project.

Measuring the impact and value of creativity

Four different ways to assess creativity, each designed for different settings:

1. Measuring How Creative a Person Is
2. Measuring How Creative a Work Is
3. Measuring Creative Work Against a Program - The Requirements Model
4. Measuring the Social Value of Creative Work - Csikszentmihalyi's Model

1.measuring a person's creativity

Each of the measures can be practiced and improved, and each focuses on creative output in the context of a prompt (any prompt) that asks for a quantity of responses. Here's an overview of the measures:

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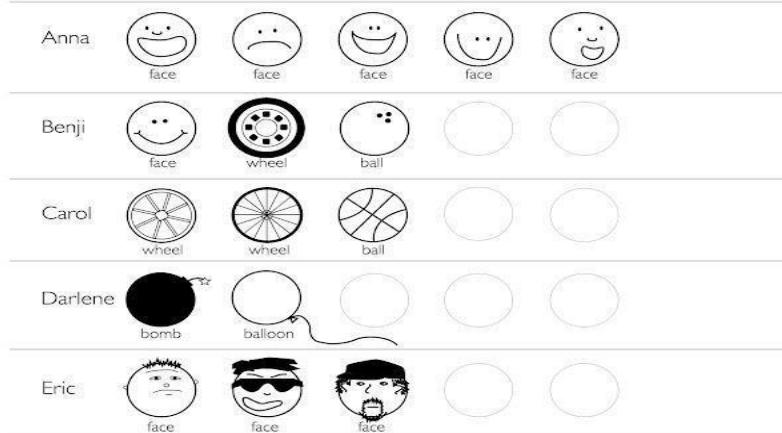
- **Fluency:** how many responses
- **Flexibility:** how many types of responses
- **Originality:** the unusualness of the responses
- **Elaboration:** the detail of the responses

So, if I were to ask five people to take two minutes to use circles as a starting point for drawings, might receive the following responses:

These responses might be evaluated in the following way:

- Anna drew the most drawings, even though her drawings were all faces.
She has the highest fluency.
- Benji drew the most types of responses, even though he has fewer total responses than Anna.
He has the highest flexibility.
- Carol drew two wheels and a ball--nice geometry!
No prize, alas.
- Darlene drew only two responses, but no one else drew a balloon or a bomb.
She has the highest originality.
- Edward drew only three faces, but with more detail than the others.
He has the highest elaboration.

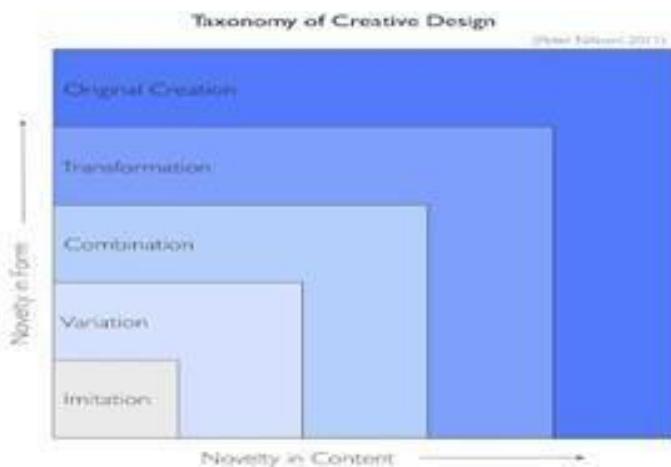
Use the circles as a prompt for drawing. Draw for two minutes.



2. The Taxonomy of Creative Design: measuring how creative a work is

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The [Taxonomy of Creative Design](#) refers to changes in form and content, and it can be used to analyze or assess the novelty or the derivation of a creative work. It looks at a creative work as a product. It classifies creative work as an imitation of another work, a variation on a single work, a combination of two or more works, a transformation of a work into a completely new form, or a creation that is previously unrecognizable. It takes the scientific approach of reduction to a creative work in order to understand its component parts.



Let's imagine, for example, that a group is tasked with solving a water transportation challenge: how can people in a remote village transport water by foot from a town well to their homes several miles away? Using the Taxonomy of Creative Design, their responses can be assessed for their creativity:

- Alex proposes they use five-gallon water jugs like the ones in water coolers; people can carry the jugs in their arms. This solution, however, really doesn't offer anything new. It is an **imitation** of something that Alex has seen before.
- Beatrice, however, suggests designing a five-gallon water jug that has a handle on it. This is a **variation** on the kind of cooler that Alex suggested. It takes a core idea and tweaks it a little bit, which adds some novelty to it, but it very much remains of the category of the original object.
- Carl, however, has kids who have backpacks that they pull behind them on wheels, and he imagines a five-gallon water jug like those backpacks: with wheels and with an extendable handle. This is a **combination** of two ideas: the water jug for holding liquid, and the wheels for pulling it around. In the end, it is both a water jug and a roller, and not one or the other.
- Dexter, on the other hand, decides that a backpack can be repurposed entirely to hold water instead of other contents. It requires a re-imagining of the materials and design of the backpack: the seams, openings, valves, and more, making it more than just a combination of a backpack and something else, for it only serves water-specific purposes and couldn't accurately be called a backpack. In this way, it is a **transformation** of a backpack rather than a combination of it with something else.
- But Eveline imagines something completely different. She imagines a cylindrical tank of water that rolls on the ground on its side and can be pushed like a lawnmower. It's not quite a jug, not quite a wagon or a plow, and not quite like anything else. It might be a

combination of many things, but in any case it appears to be an **original creation**. This has the greatest novelty in form, and so it could be said to be the most creative.

In this way, one can assess how creative a work is, one can assess the creativity of the solution by determining where the new creation fits on the Taxonomy of Creative Design. The more novel the work is in form and/or content, the more creative it is, and this classification can be clarified with several questions:

- **Imitation:** Is the creation the same or virtually the same as something that already exists?
- **Variation:** Is it a slight change to an existing object, such that it is different, but still retains the identity of the original object?
- **Combination:** Is it a mixture of two or more things, such that it can be said to be both or all?
- **Transformation:** Is it a re-creation of something in a new context, such that it has some characteristics of the original object, but it cannot be said to still be that kind of object?
- **Original Creation:** Does it appear to have no discernible qualities of pre-existing objects or ideas?

With these questions, the Taxonomy of Creative Design becomes an analytical tool for assessing the originality of an object. It does not measure difficulty, but instead how far an object reaches beyond what has come before and some of the mechanics for how it achieved those gains.

Strengths: Measures creative work in relation to other works. Assesses novelty and influence.

Weaknesses: Tells nothing of the relevance, value, or effectiveness of the work.

3. The Requirements Model: measuring creative work against criteria

In the Requirements Model creative work is assessed based on criteria (requirements) established before the work is made. In architecture for example, the design of a house begins with the program requirements:

- How many bedrooms?
- What style kitchen?
- Cost limits?
- A feeling of openness or coziness?
- Efficient use of space?

These are intentional requirements, restrictions, boundaries, within which the architect creates a new plan.

When the project is done, some assessments are straightforward:

- Is there the right number of rooms?
- Is the kitchen the right style?

- Did the project end up at the expected cost?
- Does the house feel open or cozy, as desired?
- Is space used efficiently? These seem more subjective.

And yet, they too can be concretely measured.

We can look at openness by asking questions like:

- How much light is let in?
- Are there clear lines of sight between spaces?
- How high are the ceilings?

These contribute to a feeling of openness, and they are clear, straightforward, and often quantifiable measures. Answering these questions offers direct evaluation of the seemingly more abstract program requirements.

So if we set careful requirements for creative work, we can straightforwardly assess it. We often feel that creative work falls in the realm of aesthetic subjectivity, but most aesthetic or subjective responses come from discrete pieces of information that we can measure. The requirements model suggests that identifying these discrete pieces of information is the key to objectively measuring creative work.

Strengths: Measures relevance, value, or effectiveness against clearly set requirements.

Weaknesses: Works only when comparing a work against itself, not another.

4. Measuring the social value of creative work

The value of a work lies in the relationship between three parties: the person (or his or her work), the category to which the work belongs, and the other people who engage the work. These parties broadly go under three names: the person, the domain, and the field.

Person: the artist, an individual work, or a body of work.

Domain: the genre, the area of knowledge (e.g. painting, rock music, classical music, etc.)

Field: the authorities or gatekeepers of the domain (e.g. other artists, critics, consumers, etc.)

Creativity is what happens when a Person creates a work, the Field embraces it, and the Domain changes as a result. If a writer pens a novel that expands how we understand novels, and if the field of critics, consumers, and other writers embrace it, then it is a work of creativity. This model measures value by the social or cultural response to the work. In this way, being creative means more than simply offering up any old divergent production--the term creativity isn't slapped on any piece of work. Acceptance by the Field is key. When an Artist creates a work, the Field determines whether the work is held highly in the Domain or whether it sinks into anonymity.

Strengths: Measures relevance or value in the context of a community.

Weaknesses: Can be highly subjective.

Problem Formation:

Good Problem Statements

First let's define what makes a good problem statement. These have several characteristics:

1. Insightful. They are based on real user needs that you've uncovered from research.
2. Pertinent. The problems are significant enough to warrant creating a (paid) product for. They cannot be so insignificant that most users can handle it themselves.
3. Many solutions. The statement should be broad enough to be potentially solved by a variety of solutions. This can be accomplished by making sure there aren't any specific solutions mentioned in the statement itself.
4. Directed. At the same time, the statement cannot be so broad as to become meaningless. It is important that the problem is a subset of the user's entire task.

Making Problem Statements

These are sentences that begin with “How might we”. By phrasing statements this way, HMWs spark creativity and teamwork.

1. ‘How’ suggests that the problem is not solved yet, but it’s possible to solve it in a tangible manner.
2. ‘Might’ means that the solution is not decided on, but we are open to exploring options.
3. ‘We’ prompts us to think of solving it as a team, leveraging each other’s insights and skills.

An **Impact-feasibility chart** to see which problem we should tackle now



Product Design

- Introduction to design
- Introduction to product design

What is design?

Design is a way of experiencing!

Observe and empathize: design for people

User-centric design

Understand people's tasks, goals, and values

Pay attention to people's abilities and situations



Product design is about life...

and death

patients stayed an average of
3.7 days fewer if they were
exposed to morning light

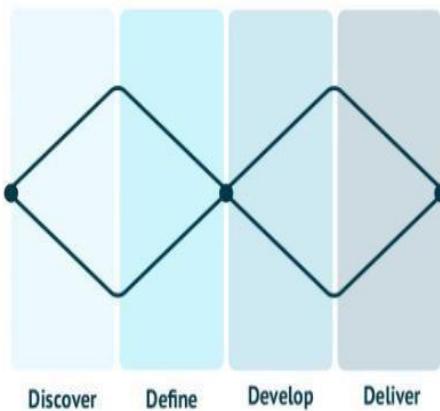


"I would say that we see at least **two to three patients a week** who've been injured by these products."
- Director of burn unit

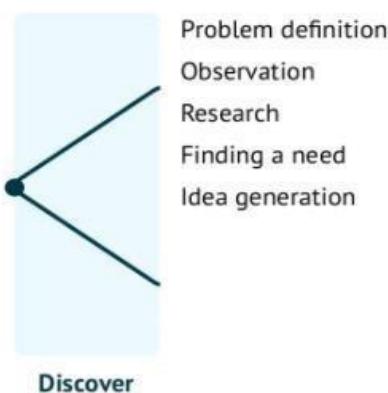
"Ingestion of mouthwash during sleep increases risk of burns." J Burn Care Res. 2006

How do we design products?

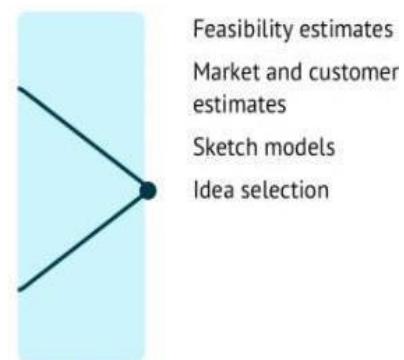
Product design process



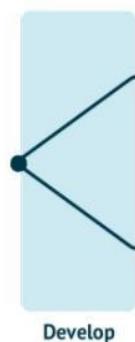
Product design process



Product design process

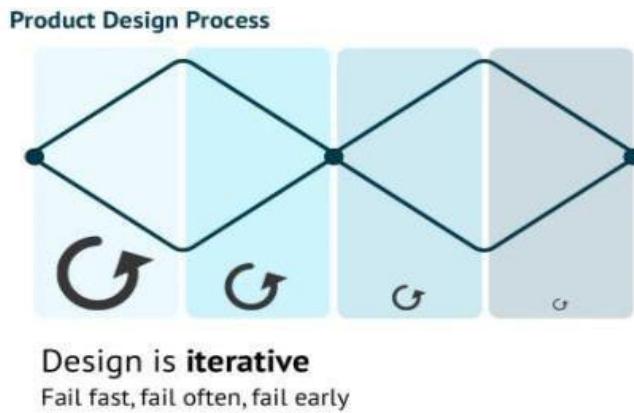


Product design process



Product design process





Product Strategy

The product strategy outlines how the product will benefit the business. It describes the problem that the product will solve and the impact that it will make on customers and the company. The product strategy then acts as a baseline that you'll measure success to before, during, and after production. The graph below outlines how this relationship plays out.



Four types of Product Strategy

- Being the Alpha

(is to be the market leader, creating innovative products that'll leave your competition lagging behind. It's expensive, it's risky, but the rewards can be huge.)

- Giving the Alpha a Run for Its Money

(is to challenge the market leader by beating them at their own game.)

- Piggybacking

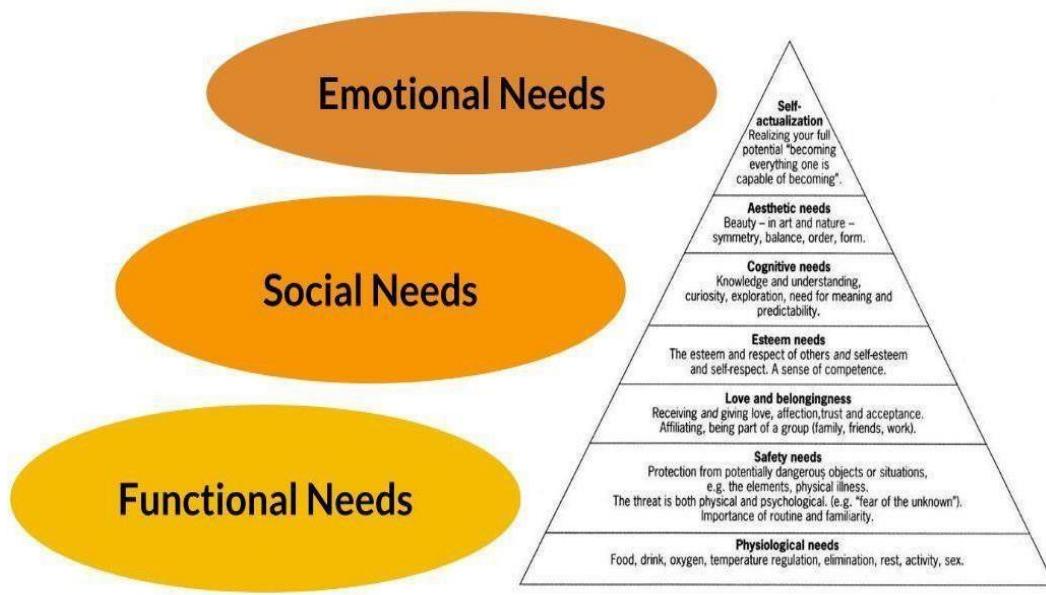
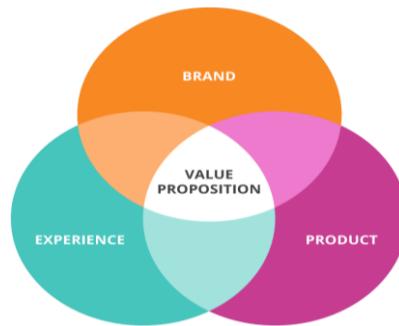
(is to piggyback on the innovations by the leaders and their challengers. You don't create any innovative products yourself, but use them to create cheaper, derivative products.)

- Dominating a Corner

(is to create a product for very specific types of people in an otherwise large market. This allows you to work with limited resources because you don't cater to everyone in the larger market.)

Product value

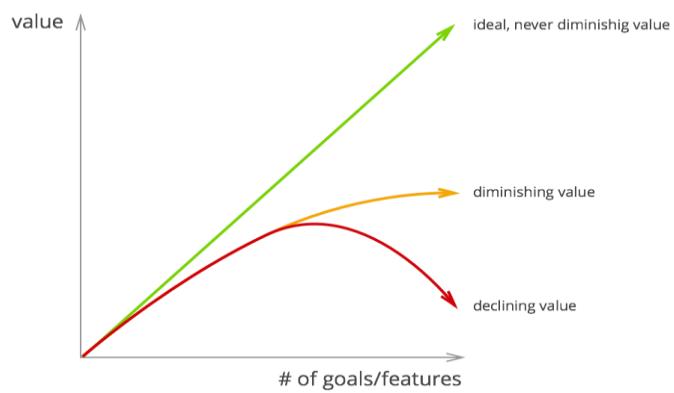
“Product value is the benefit that a customer gets by using a product to satisfy their needs, minus associated costs. Complexity is the effort associated with delivering such a product to the customer.” There are two critical lenses a great product manager needs to look through to decide what functionality a product should have — **value and complexity**.



Maslow's hierarchy of needs

Ideal value, diminishing value, and declining value

Products typically consist of a set of features that, combined together, deliver total product value. A simple logic along the lines of “the more features, the better product,” could thus guide us. There is a caveat though. This logic assumes that every new feature would not negatively impact the experience at all. But let’s look at a graph with three value curves:



Product Planning

What is Product Planning? (Definition)

Product planning is the process of identifying and creating a new product idea with all product-related requirements such as its features, price, promotion, distribution, etc. Product planning aims to align the assets of the business and operational factors, to focus on product development, design, and engineering efforts. The purpose of it is to deliver the greatest probability of success in achieving [business goals](#) through effective product strategy.

What Is the Purpose of Product Planning?

The purposes of product planning are

- earning maximum profits
- making the best possible exploitation of the available resources
- providing customer satisfaction.

Essential Product Planning Benefits

1. Improving customer service
2. Optimum utilization of resources
3. Better inventory control
4. Enhancing the role of the brand image

Step by Step Process of Product Planning:

Product planning presents a much larger view of the management and technical side of a product-based business which includes all of the moving parts from inception to exit.

Here are the **key steps of product planning** that you should go through when building out a new product:

- 1. Define the product concept**
- 2. Add details of your market research**
- 3. Plan your product testing process**

Process Planning Steps

1. Define the product concept

This is the most crucial step in your business that pivots and defines what you are trying to build as a product. Jot down this stage and ensure your idea for the product is a real idea. Another part of the product concept is making sure you have a firm knowledge of the upcoming problems based on your strong understanding of the solutions needed.

2. Add details of your market research

Once you have walked into the first step and have an idea or concept that solves a real problem, now it is time to do some market research. During this stage of product planning, you need to prove that your idea has a market to sell.

This includes **studying your competition**, analyzing their weaknesses & strengthens against yours, and finding out the niches where your product can have an advantage over your competitors.

3. Plan your product testing process

If your product planning has crossed step 1, step 2 of building a concept and confirming that there is a place in the market for your product, the next step is to build the MVP (**Minimum Viable Product**), so you can put a real-life product in front of customers or users for them to look at, test and provide feedback on the product.

4. Write product maturity details

After the launch, you need product maturity. This is where the product roadmap merges with the product planning. A product roadmap will help you with smooth working on building out your product teams, pricing changes, infrastructure, as you add more features and overall sales and marketing approaches.

5. Explain the product life cycle

The process of product planning does not stop with a product launch. It should also include managing the product throughout various stages of its product life-cycle.

Product Specifications

What are Specifications? (1 of 2)

Customer needs are expressed in "The Language of the Customer "

Example: "The suspension is easy to install"

Cons: Subjective, too much room for interpretation

What are Specifications? (2 of 2)

- Development teams establish a set of specifications
- Specifications spell out in precise measurable detail what the product has to do
- Specification would be: "The average time to assemble the fork to the frame is less than 75 seconds"

Product Specification

What Is a Product Specification?

A Product Specification, commonly referred to as a product spec, is an important product document that outlines key requirements for building a new feature, functionality, or product. Like a blueprint, a product spec contains key information (e.g., target users, business needs, goals, and other essential details) to help guide the product team in building a [successful product](#).

An effective product spec is concise, brief, and not overly technical. It should answer these key questions:

1. What are we building, and why?
2. What should this new product achieve?
3. How do we measure success?



Product Specification

Product Summary	Description of the product idea and summary of the final product, features, and a timeline. Also provides the "why" the product is being created. Answers: What idea is being suggested?
Business Case	Describes the business case for building the product, including benefits/advantages for the company. Also, outlines requisite budget or resources. Answers: What is the business value or value for the target user?
User Stories	Brief user-perspective summaries that describe desired features (e.g., As a feature, I [goal] so that [benefit]). Answers: What is the target user trying to do?
User Personas	A description of relevant characteristics, needs, and goals of the target users of the product. Answers: Who is the solution for?
User Personas	A rough physical design of the product. Usually starts with a sketch or technical drawing that evolves as development progresses. Answers: What does the solution look like?
Functional Spec	A written document that includes the capabilities of the product and how it should interact with users. Answers: What are the technical details behind the solution?

UNIT IV DESIGN THINKING FOR STRATEGIC INNOVATION

An exercise in design thinking - implementing design thinking for better process. Implement design thinking process in various Industries. Design thinking for Startups.

An exercise in design thinking

Here at Innovation Training, we've spent over a decade studying and applying design thinking techniques to help organizations and individuals create real, innovative change. Design thinking can help you figure out new solutions to grow and improve old processes and practices by doing things in better ways. While the steps in the design thinking process have remained roughly the same, new activities and exercises are being created to help individuals apply this mindset and unlock the innovations they need to be successful. In this blog post, we'll share some of the most popular **design thinking exercises and activities**, validated by research shared in a popular design thinking book, the Design Thinking Toolbox.

1. Interviews

- Interviews are an effective early-stage understanding and observing process that can help you gather insights into the problem your users are encountering, why it's a problem for them, and how it's impacting their life.
- You can better understand who the end user is and how to cater a solution directly to their needs and interests.
- One of the simplest ways to do this is to simply talk with your users and potential users. These interviews will be invaluable as you begin to piece together this information, ideate potential solutions, and later on build rough prototypes of some of these ideas.

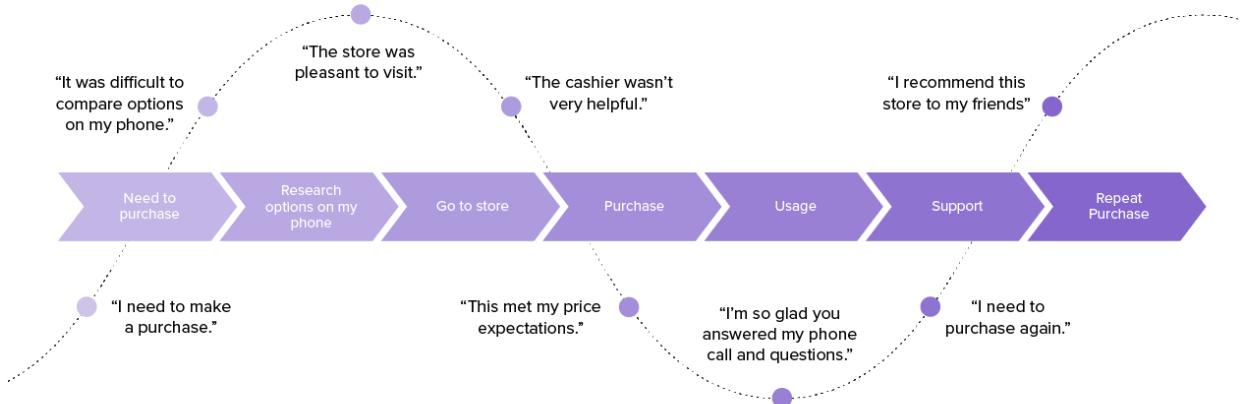
2. Jobs to be done

- Jobs to Be Done (or JTBD) is a theory about consumer action in which customers are purchasing products and services to get a specific “job” done in their life. Ultimately, the JTBD framework can help you better understand your users and create a more compelling customer experience for them.
- JTBD is a pretty big framework in its own right but some key activities from this approach (like identifying the job to be done your user wants/needs to do) help you in moving from the empathy to define stage of design thinking.

3. Customer journey maps

- Customer journey maps provide a roadmap visual of the customer's experience – from initial contact to each point of engagement in the long-term relationship. This mapping tool can be used to identify critical interactions a customer has with your organization that may need improvement or modification to improve the experience.
- consider using one of these customer journey map templates from Miro to use this technique in your own design thinking project.

Retail customer journey



4. Empathy mapping

- Empathy plays a critical role in design thinking. Our ability to understand the problems and realities of the users we are designing for ensures that we are able to create the right solution to overcome their challenge.
- Empathy mapping is a way to visualize everything you know about your user. This information can be gathered through interviews, observations, and other sources to create a 4 quadrant grid that explores what your user is saying, thinking, doing, and feeling.

5. Personas

- Personas are fictional characters that represent a type of user or customer. This fictional character is created based on an understanding of what you've learned from your real customers and users, and can be used to better understand their needs, behaviors, experiences, and goals.
- These persona templates from Mural can help you build out these characterizations.

6. Brainstorming

- Brainstorming is one of the most used ideation techniques to develop ideas to overcome innovation challenges. Brainstorming rules can help you to structure your session.
- There are many different brainstorming activities and tools out there to help you ideate quickly and generate many more ideas than ever thought possible.

7. SCAMPER

- SCAMPER is an acronym that actually combines multiple design thinking ideation techniques into one, including adapting ideas to solve a different problem, eliminating inefficient processes, and reversing direction to do things the other way around.

8. Prototyping

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- Once you have an idea, it's time to prototype and test it to see if it may be an appropriate solution for your challenge.
- Prototypes can be rough designs of your idea that can be shown to get feedback and see how the user might interact with it. Initial prototypes may be as simple as a drawing on a piece of paper or a digital wireframe.

9. Testing with users

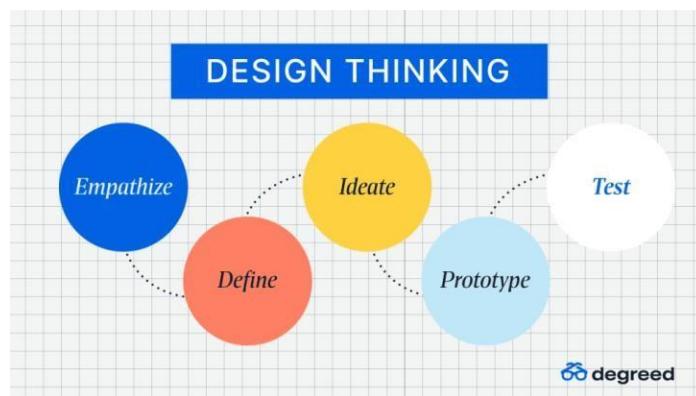
- Another popular way to test your ideas in action is to utilize your users (or those who may become users in the future) to better understand the usability and functionality of your solution.
- Testing a smaller or less advanced version of the solution with your users allows you to make in-the-moment changes to better fulfill their needs before you spend the full time/energy/money needed to reach a more final version of the solution.
- Friend groups, current customers, or relatives can be an easy way to test your solution and see possible uses or issues with the product beforehand. They are easy people to interview first.

Final Thoughts on Design Thinking Exercises and Activities

Design thinking is a tried-and-true method of developing innovative and useful solutions to complex challenges that may be impacting your organization or personal life. There are many other innovation activities and exercises for innovation out there that can help you take this methodology and apply it to your own unique challenge or problem.

Implementing design thinking for better process.

Design thinking isn't about your knowledge of design concepts or color palettes; rather, it's about designing tools and processes with end users in mind. When you design programs or platforms directly for users, you can increase engagement, adoption and satisfaction.



What is a design thinking process?

A design thinking process starts with the belief everyone is a designer and design is everywhere. While the above image suggests a step-by-step process, design thinking is non-

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linear and iterative. It means companies like Degreed are continuously building, redefining, innovating and improving products and services.

The five stages of design thinking are shown in the image above and consist of:

Empathizing: Understand your users and their needs.

Defining: Analyze and identify issues to be solved.

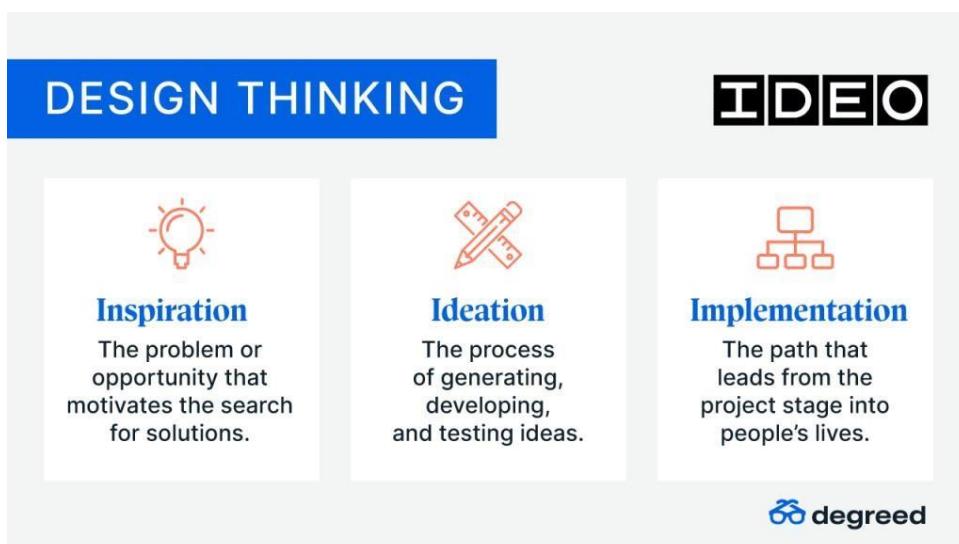
Ideating: Create and share ideas — even the off-the-wall ones.

Prototyping: Draw up solutions.

Testing: Just as it says, go forth and test your solutions.

When you stop and think about the process, you might realize you use it in everyday life — all the time. You practice design in the ways you plan out your day, arrange furniture, build spreadsheets or create training programs.

The most important foundational piece of design thinking is integrating the end users' needs before you begin creating, so time isn't wasted solving the wrong problems. It's a mindset of relentlessly trying to understand the user and problem at hand.



Actionable design thinking steps

You can implement design thinking and bring its benefits to your organization in four key ways:

1. Focus on the problem

Companies often fail at effectively solving problems or meeting goals because they don't correctly identify the user or problem initially. To identify your problem, you can:

- **Listen.** Put yourself in users' shoes and think through their lenses.
- **Ask questions.** Who encounters the problem and why? Why did past attempts to solve it fail?
- **Have collaborative conversations.** Working in silos is a trap. Engage with everyone, not just your team.

- **Stay unbiased.** Don't assume you immediately understand the problem or solution. By being open-minded you might find something you weren't expecting.

2. Develop design thinking skills on your team

Traditionally, project managers or engineers handled the ideation phase of the design thinking process. But it's not limited to those functions. Everyone can and should participate by asking questions, understanding and testing. To develop your team's design thinking skills, you can:

- **Practice the mindset.** Start implementing the process in your role whenever you can. For example, if you oversee onboarding, think about ways you can test a new approach or understand the new employee mentality by gathering feedback through a survey. Remain open to new outcomes.
- **Foster interest.** If you have team members who want to take initiative and expand their skill sets, make sure to nurture that — by encouraging experimentation or perhaps reimbursing costs for design thinking classes.

3. Have (or start having) more debriefs

This is a continuous process. It's a process of iterating on previous experiments so the product or outcome can improve. However, learnings can't be implemented if there's no feedback. To create a learning culture through gathering feedback, you can:

- **Be open about what went wrong.** Set an example by demonstrating failure is an expected part of design thinking. Openly discuss which tests failed and why.
- **View failure as learning.** Trying and failing a new approach serves the crucial function of narrowing the list of possible processes. This gets you and your team closer to the best approach. Encourage failure.

4. Embrace the feedback loop

The goal of design thinking isn't perfection but finding the best answer possible. And the best answer likely won't be the first answer. A constant feedback loop is essential. To implement a feedback loop, you can:

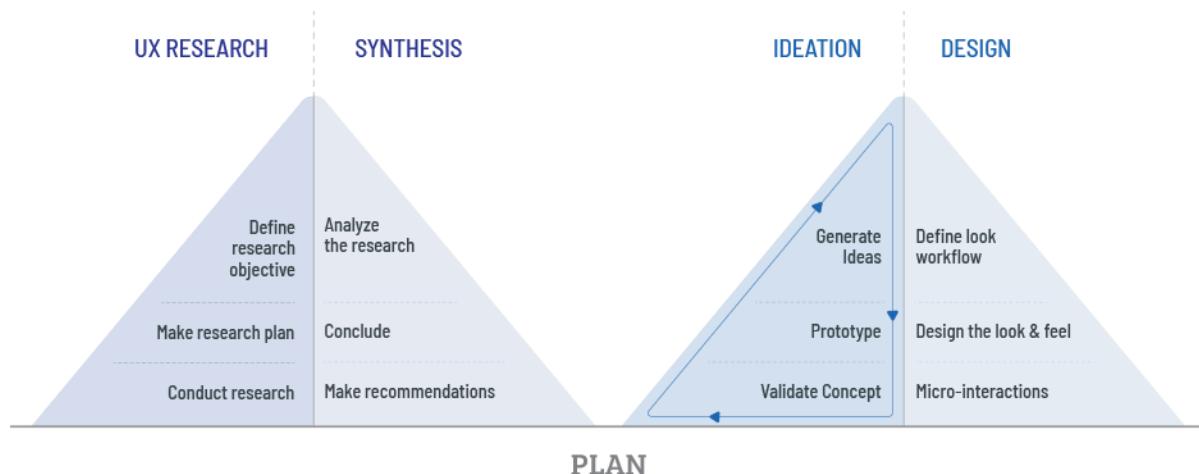
- **Test and iterate as much as possible.** Find new ways and angles to try out your assumptions. You might come across something you would've never thought of otherwise.
- **Have feedback sessions often.** When you embrace feedback, it creates a safe space to innovate and prevents the same mistakes from happening again.

Design thinking can help you and your team identify and solve meaningful problems. The process is like a muscle you build and use. With a design thinking mindset, you can spend time effectively solving the right problems and building processes that will impact your organization's success.

Implement design thinking process in various Industries

HEALTH CARE :

- The Research phase of the design process involves the study of the actual user demographic to gain meaningful insights into their behavior. User research techniques include contextual inquiries, user interviews, surveys and questionnaires, observational studies, etc., which do the job of mapping the user journey from the point of origin to the destination – and thereby covering their pain points at various stages.
- The synthesis part of the process is where the collected data is analyzed and made sense of. Conducted in succession, these methods manage to give a voice to the patients, caregivers, as well as stakeholders, letting all three sides weigh their opinions regarding the entire system and be heard.



- Thus, in the further stages of design when the actual solution building happens based on user experience, it ends up being high on utility, practicality, and financial feasibility, solely because it is not sourced through thin air and is instead focused on solving real-world user problems in real-time.

Case in point –

- A study investigating the hypothesis that improving access to healthcare for the transportation-disadvantaged population revealed that 3.6 million people miss or delay/reschedule their medical appointments due to issues related to unreliable transportation.
- This accounts for billions of dollars in annual costs for healthcare providers across the nation. These missed or last-minute reschedules end up creating several operational challenges as well, like schedule disruptions of care providers to interference with patient care and treatment.
- The specific reasons behind these no-show cases hold the key to improving the overall patient experience and saving those billions that go down the drain. In such cases, User Experience (UX) research and synthesis deep dives into observing and assimilating user behavior — from what happens before people get to the hospital to what happens after they leave — reveals telling insights that usually go unnoticed.

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Ideation – a phase of design thinking (healthcare) which is an iterative process of finding creative solutions – is what helps keep up with this frenetic pace of progress.

- As the [healthcare sector evolves](#), so do its problems. Improved healthcare, for instance, is a huge factor in increased longevity, which throws up the complex challenges of handling a growing population of the elderly.
- Another instance is centered around the increased awareness of mental health – considering that isolation and loneliness can be as debilitating to human life as cancer or diabetes.
- These are the challenges confronting the healthcare ecosystem at the moment, the kind of questions that require a deeper understanding of user behavior and curating unique solutions directed at specific as against generic problems.
- The ideation techniques in the design process involve brainstorming wherein designers, based on the research data, come up with feasible and creative solutions to solve problems in an efficient, budget-friendly manner.
- These ideas are turned into simple prototypes, which may be used in user testing to ensure that the solution is headed in the right direction. Based on the feedback gained in the user testing phase, the prototypes are further refined before being moved to design.
- Design thinking is piercing various aspects of our lives, including healthcare, even though adopting approaches that can make everyone's life better takes time.
- Many medical professionals across the world are implementing the method as a way to make the patient's hospital experience and healing process more pleasant. Believe it or not, there are hospitals that no longer look at the patient as if they were an ATM machine that they can drain financially by forcing them into healthcare programs that are not relevant to their treatment.
- Also, medical students are now using empathy to address the voids when it comes to patient care, especially if the suffering feels a bit alienated from the outside worlds by the illness.
- According to the Board of Innovation, 2020 will be dedicated to health technology with a human touch. The rising trust in technology is finally triggering a disruptive change in the healthcare industry. There are a few startups that are using [people's health-related](#) information in order to predict illnesses or medical conditions.
- For instance, Startup Ciitizen is working towards giving cancer patients access to their own health records and the Medopad company has developed an app that compiles and analyzes health data from patient wearables, mobile devices, and medical bodies to predict chronic diseases.
- Soon online doctor's visits and non-invasive operations via robots will also be possible across the world because of 5G. Thus, healthcare corporations and startups should no longer think only about the treatment and diagnosis of the patients, but also about providing a reliable, easily accessible, and user-friendly patient environment with short communication lines and personal interactions.

PUBLIC SECTOR

- In recent years, design in the public sector has gained popularity amongst policymakers as well as among scholars. Design is perceived as a promising way to create more

successful policies and public services. Despite growing popularity, a critical reflection on benefits and challenges, as well as about different understandings of design practices in the public sector, are still lacking.

- Therefore, this paper aims to investigate different ways public organizations engage and introduce design approach. In this paper we present 3 municipalities in Denmark and the way design is understood and implemented in organizational work practices.
- Our contribution to theory is twofold. First, our research responds to the recent call of different researchers to investigate how design is operationalized and drawn upon in practice by different organizations in the public sector. Second, our research contributes to the design field, by showing barriers of implementations, different benefits and challenges connected with design in organizations with no prior experience in design
- Governments across Europe are now turning to design thinking when it comes to policymaking and designing efficient public services. The main goal is to equip themselves with innovative approaches to face contemporary challenges, related to economic, social, environmental patterns, as well as to regain the trust of citizens.
- Framing the problem correctly from the start is a pre-condition for effective policy formulation, development, adoption, and implementation. Professionals, citizens, and representatives from the private sector are all included in the process. They are no longer considered merely passive receivers at the end of the regulatory, administrative and public service delivery chain.
- It is quite remarkable that the governments of countries like Denmark, Finland, Estonia, France, Latvia, and Ireland are adopting design thinking. It is a well-known fact that in 2012, when Helsinki was proclaimed the world's design capital, Finland invested an unprecedented € 17 000 000 to promote service design opportunities. Several years ago, the Irish government also invested € 5,000,000 in raising awareness of the benefits of design thinking. The impact report from this national campaign shows that 370 new service design companies have been created.

SPACE EXPLORATION :

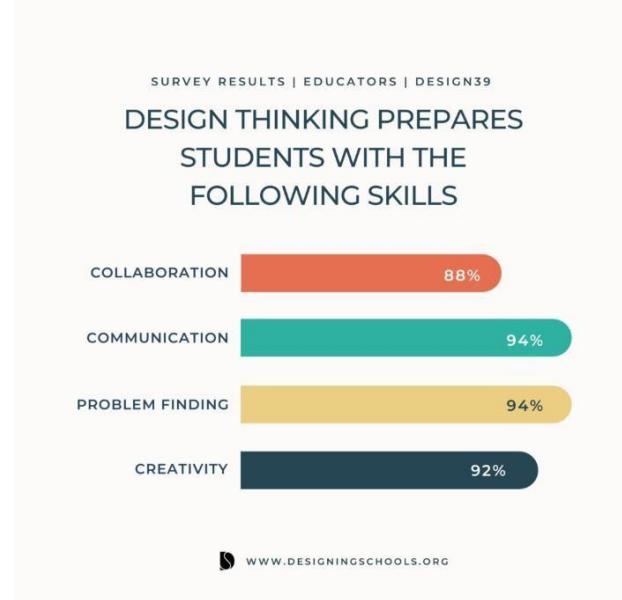
- The next generation of humans in space is now entering schools. Space exploration and data management have now to be integrated in the training of the future Space and Earth explorers. This challenge will require different types of careers, talents and skills.
- The profile of the 21st century student needs to encompass the learning pillars required for any worker in the future labor world, the 4 Cs: Communication, Critical Thinking, Collaboration and Creativity. These are the key requirements of any modern standards for school education.
- To achieve this, a large global effort needs to be put in place. During this presentation we intend to present a new education strategy where students and communities work together for the construction of a modern and relevant school system, a system that goes beyond the school walls into the community and vice-versa.
- In this model, Space Exploration and Astronomy assume a key role due to its multidisciplinary nature. From basic concepts to cutting edge research the skeleton of a meaningful education can be enriched and built around relevant modern trends for science education and taking into account the competence profile of 21st century educators and learners.
- So you have heard about design thinking and are curious to see how you might use it. Or perhaps you have used it before and you are looking to elevate your practice.

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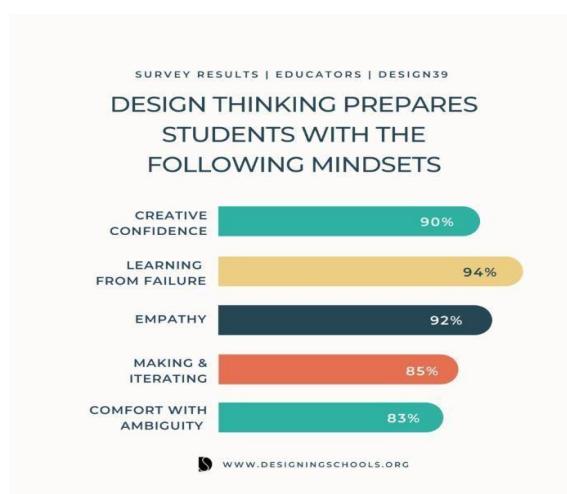
- Whether you are new to design thinking or whether you are a veteran, in this article I'm going to break out of the hexagons and share what design thinking is, and the results students and educators see when integrating it into the curriculum to design learning.
- In 2019 I led a two-year research study at Design39 Campus in San Diego, CA evaluating how design thinking was being used by educators to challenge traditional practices. The study explored how they were complementing their standards-based curriculum by having students examine real world problems. It examined how the educators learned about design thinking and how to design learning experiences at the intersection of knowledge, skills and mindsets to encourage creative problem solving.
- The topic of space exploration thrills people around the world because of the new missions being designed and new careers being foreseen. There is also a possibility that humans might start living elsewhere. Space exploration will require - and has always been about - reaching the limit of our technology and bringing people beyond. Individuals facing these challenges must train their creativity, critical thinking, perseverance among other important skills.
- In recent years space exploration is driven not only by scientific genius but by artists and designers. They collaborate with astrophysicists to create visuals that explain the concepts of a certain mission more clearly. Some of NASA's scientists have also established a "storytelling initiative" that empowers their colleagues. By understanding and articulating the bigger picture behind their concepts, scientists ground their genius with [human needs](#). "So when these missions materialize for the rest of the planet, these ideas are not alien abstractions, but public admiration", points out an article in Digital Surgeons.

WHAT IS DESIGN THINKING IN EDUCATION?

- The results indicate strong agreement amongst the educators between developing in demand skills such as creativity, problem finding, collaboration and communication and practicing design thinking.
- What makes design thinking unique in comparison to other frameworks such as project based learning, is that in addition to skills there is an emphasis on developing mindsets such as empathy, creative confidence, learning from failure and optimism.
- Seeing their students and themselves enhance and develop their skills and mindset of a design thinker demonstrated the value in using design thinking and fueled their motivation to continue. In addition, it strengthened their self-efficacy and helped them embrace, not fear change.



- As workplaces determine how to leverage new and emerging technologies in ways that serve humanity, the two critical skills expected will be the ability to solve unstructured problems and to engage in complex communication, two areas that allow workers to augment what machines can do (Levy & Murnane, 2013.)
- Brynjolfsson and McAfee (2014) call this era, “The Second Machine Age,” characterized by advances in technology, such as the rise of big data, mobility, artificial intelligence, robotics and the internet of things. The World Economic Forum calls this era, “The Fourth Industrial Revolution.”
- Regardless of the name we give this era, Schwab warned, as did Brynjolfsson and McAfee, that failure by organizations to prepare and adapt could cause inequality and fragment societies. An outcome we saw unfold in 2020. The authors continue to share that while the dynamics of today’s world have the potential to create enormous prosperity, the challenge to societies, particularly businesses, governments and education systems, will be to create access to opportunities that will allow everyone to share in the prosperity.



- Design thinking has the ability to reconnect educators to their creativity and aspirations so that they can help the students develop their own skills further. A lot of practitioners are now flexibly customizing the design thinking process so that they could fit their specific environments. There are 4 essential modes that teachers are focusing on when implementing the method: leading with empathy, challenging assumptions, making experiments happen, and sharing their creative progress.

Empathy is the root of human-centered design and professionals cultivate it by listening to their students more. They believe that learning should not adapt to pedantic or regulations, rather to the student's needs. Challenging assumptions and reframing the problems is also critical for letting children innovate and learn by experimenting. But design cannot thrive in isolation, so teachers and professors share their experience with implementing the design thinking approach so that they can inspire others to try and benefit from using the method.

Design thinking in Retail :

Design Thinking in the retail sector has been successfully deployed by retailers from a German Butchery to mass market retailers in the USA like Best Buy and Walmart.

Design thinking is an innovative and customer-centered approach that has been widely adopted in the retail industry. It is a problem-solving methodology that helps retailers to understand the needs and preferences of their customers, design new products and services, and improve the overall shopping experience. Here are some of the key benefits of design thinking in retail:

1. Customer-focused approach: Design thinking encourages retailers to focus on the needs of their customers. By understanding their needs, wants, and pain points, retailers can design products and services that meet their customers' expectations.
2. Innovation: Design thinking promotes a culture of innovation in retail. It encourages retailers to think creatively and come up with new ideas that can improve the shopping experience for customers.
3. Cost-effective solutions: By using design thinking, retailers can develop cost-effective solutions that are based on customer feedback and insights. This approach helps retailers to reduce the risk of investing in products or services that may not meet customer expectations.
4. Improved customer experience: Design thinking can help retailers to create a better shopping experience for customers. By focusing on the customer journey, retailers can identify areas where they can improve the experience, such as store layout, product displays, and checkout processes.
5. Increased sales: By using design thinking to create products and services that meet the needs of their customers, retailers can increase sales and customer loyalty. Happy customers are more likely to return and recommend the store to others.

In conclusion, design thinking is a valuable tool for retailers who want to stay competitive in a rapidly changing retail landscape. By focusing on the needs of their customers, retailers can create innovative and cost-effective solutions that improve the shopping experience and increase sales.

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For the Swedish furniture giant Ikea design thinking is at the heart of the company's creative process. All of its products are designed according to the five dimensions of their "Democratic Design" principle: form, function, quality, sustainability, and affordability. The story behind the creation of a product can be crucial when deciding if you are going to get a certain piece of furniture or not. Storytelling also creates a strong emotional connection with the customer.

Design thinking is also assuming a more prominent role when it comes to fashion. For instance, [Nike](#), has a team of more than 1,000 designers who strive for innovation and experimentation. "The company partnered with DreamWorks to build a 3D digital design system and its Nike By You Studio, which uses augmented reality, object tracking, and projection systems to allow users to make custom shoes they can then pick up just an hour later, has won over customers with its "live-design experience", says an article in Brain Station.

ENTERTAINMENT :

Design thinking has been applied to the entertainment industry to develop innovative products and services that meet the needs and expectations of consumers. Design thinking is a human-centered approach to problem-solving that emphasizes empathy, collaboration, and experimentation. It involves understanding customer needs, generating ideas, prototyping solutions, and testing them in the real world.

There have been both successes and failures in the application of design thinking in the entertainment industry. Some companies have successfully used design thinking to create engaging and immersive experiences for their audiences. For example, Disney has embraced design thinking to create new rides, shows, and attractions that provide guests with a memorable experience. The company has a team of "imagineers" who use design thinking to bring their ideas to life.

Other companies have struggled to implement design thinking successfully. Some have failed to fully embrace the customer-centric approach of design thinking and have instead focused on internal processes and systems. As a result, they have developed products and services that do not resonate with their target audience. Other companies have found it challenging to overcome organizational barriers and cultural resistance to change, which has hindered the implementation of design thinking initiatives.

Design thinking has the potential to transform the entertainment industry by creating new and innovative experiences that captivate audiences. While some companies have successfully implemented design thinking, others have struggled to achieve success. However, the increasing adoption of design thinking in the entertainment industry suggests that it is a valuable approach that will continue to drive innovation and engagement in the industry.

Netflix and Amazon Prime have reached new heights when it comes to online video streaming. Their audiences are watching their favourite shows when it is most convenient for them from any location suitable. But only several years ago things were way different because entertainment was cable dependent and consumers couldn't access their favourite shows whenever they had free time to spare.

The first brand to introduce the idea of satellite and cable independent subscription-based entertainment was HBO. The company turned to design thinking to reshape the shows

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and user-experiences. The tailor-made original programs were based on the customers' needs and behaviors. That's how the company was able to revolutionize the audience experience and come up with consumer-inspired solutions. Moreover, HBO opened up to iterative prototyping and saved considerable expenses while launching products that customers loved.

DESING THINKING IN FOOD AND BEVERAGE INDUSTRY

Design thinking can be a valuable approach for innovation in the food and beverage industry, as it allows companies to understand the needs and desires of their customers and develop products and services that meet those needs.

Here are some ways design thinking can be applied in the food and beverage industry:

Empathize: Understand the needs and desires of customers by conducting interviews, surveys, and observation. This can help identify key trends and preferences in terms of taste, nutrition, packaging, and convenience.

Define: Use the insights gained from empathy to define the problem or opportunity. This can involve reframing the challenge, such as identifying a new market segment or rethinking an existing product line.

Ideate: Brainstorm and generate a range of potential solutions, including new product concepts, packaging designs, marketing campaigns, and distribution strategies. This can involve cross-functional teams that bring together diverse perspectives and expertise.

Prototype: Build quick, low-cost prototypes of the most promising ideas to test and refine. This can involve creating physical prototypes, as well as virtual or digital prototypes that simulate user experiences.

Test: Gather feedback from users and stakeholders to evaluate the effectiveness of the prototypes and refine the design. This can involve conducting focus groups, usability tests, and A/B testing.

By using design thinking to create innovative food and beverage products, companies can stay ahead of the competition and better serve the needs of their customers.

Indra Nooyi's impact on the development of PepsiCo when she implemented design thinking at the core of creating every product and service related to the brand. Before she came along, the company was perceived as a sinking ship that couldn't retain its investors or sales. PepsiCo tried to capture what appealed to their target customers and use that data to renovate their products. Sales grew up to 80 percent during the 12 years Nooyi served as CEO. Now the company has not only reclaimed its position on the market but has also inspired other brands to create personalized customer experiences via design thinking.

The method plays an essential part of Starbucks' success as well. In 2008 they had to close more than 600 shops after the economic collapse and the shift in senior leadership. After conducting research with their customers, they realized they needed their stores to better reflect their local environments. This posed a problem considering their designers were all based

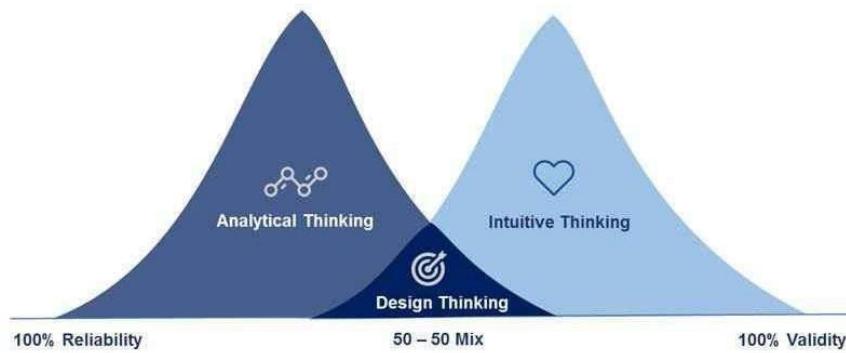
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at their Seattle headquarters. Now the company has designers all over the world and has launched a series of impressive design studios.

DESIGN THINKING IN BANKING INDUSTRY :

In a digital world laden with choice, banks' customers need choice, empathy and ease of use designed into every communication they have with the bank and they need to deliver on that speedily, before their competitors, which now include retailers and other non-banking financial institutes.

We can rather say that Design thinking is shifting bank operations away from “managing” and more toward innovating. It is nothing but the consolidation of analytical thinking and intuitive thinking.



DESIGN THINKING IN TECH INDUSTRY

The Information Technology (IT) industry has been booming across the world since a few decades. The industry employs a large number of people across the globe and is the hub for innovation every day. The IT industry is now working mostly on **Agile methodology**, which is a technique of project management.

Agile is **an iterative or incremental method** of managing development and design. Each day, the engineers have a set of tasks at hand, which they are required to complete in a day or two. Moreover, the complex problems shot by the customers to the engineers are required to be solved quickly. In such a scenario, design thinking helps to solve the problems and address the exact needs of the customer.

Solving the customers' problems requires an intuitive thinking and understanding by observing exemplary use cases or scenarios. Hypotheses and theories are not encouraged. This intuitive understanding is developed by design thinking principles. After getting the problem statement from the client, the engineers are supposed to brainstorm on ideas and suggest solutions to the client.

Before ideas can be thought of, it is imperative for the engineers to do an in-depth requirements gathering. This helps to understand the exact needs of the client and also helps to make the analysis and synthesis easier. In a **Waterfall model**, which is different than the Agile model, the process starts with requirements gathering, followed by creating the visual designs

and then occurs the development of solution. Testing is the last step in the model. Looking closely, it is similar to the process of design thinking.

The IT engineers today are supposed to understand the problem statement in the exact manner as felt by the client. Otherwise, both the solution and the time invested will fail. Once requirements have been gathered, only then can the developers start thinking of programmatic solutions.

The solutions that are developed are sent for the client's experience. The feedback given by the client helps the designers and developers to iterate the process of software development. Design thinking has been used extensively in IT companies to brainstorm for solutions towards customer's problems. The **advantages of using design thinking in IT industry** for software development are as follows.

- The solutions are prototyped.
- The results are verified.
- The best solutions are accepted.
- The solutions are experienced by the client before approval.
- Short iterations are possible to improve the user experience.
- Small cross-functional teams.
- Incremental delivery is possible.
- Fast feedback helps the designers and developers.
- Continuous improvement is possible.

The use of design thinking principles have grown so much in the IT industry that nowadays world-renowned companies like Infosys have made it mandatory for its employees across the globe to undergo design thinking courses and get certified as a design thinker.

The concept of design thinking is central to the process of developing software solutions, which target the exact needs of the customer and have the flexibility of getting modified in an iteration process based on the feedback given by the client.

The financial sector isn't always associated with progressive problem-solving, but in recent years the world's biggest banks have seen the benefits of implementing design thinking. Following the footsteps of Bank of America, who obtained thousands of new customers with their "Keep the change" program, other major actors were also able to see the disruptive nature of the method.

Capital One contacted design firms Adaptive Path and Monsoon and focused on empathy and user-centricity in order to create a series of new digital features, including an emoji-enabled chatbot and GPS-tracked transaction histories. Two years ago the company launched a 42,000-square-foot Innovation Center. On the other hand, investment company JPMorgan Chase hired former Yahoo design executive Tim Parsey. Soon after that, they updated its app with features

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meant to improve the mobile banking experience by weaving in local imagery. They wanted to create an experience that started with emotion and thrived to humanize the user experience.

Ever since Thomas John Watson Jr. of IBM claimed that “good design is good business,” design thinking has become a pillar principle for successful tech companies worldwide. Design thinking has helped the Chinese mobile brand Vivo to understand and connect with its customers in a highly competitive market. The company realized how crucial the method was and started crafting their products to target the young consumer market in China.

The company built a concept store as a way to promote their brand values in a more tangible way. A research the company made revealed that young customers look for opportunities that will expose them to new experiences, enrich them personally and help them build their knowledge and skills. So Vivo created multimedia units that customers can interact with in order to improve their overall experience. Design-driven companies have maintained a significant stock market advantage, outperforming the S&P 500 by 211 percent between 2005 and 2015, according to the Design Management Institute.

DESIGN THINKING IN AUTOMOBILE INDUSTRY

Only a handful of companies can match the audacity of Elon Musk and Tesla Motors when it comes to big, bold and extraordinary ideas. The company is using design thinking to create industry-shifting innovations and inspiring user experiences throughout its stores.

Interestingly enough, when Franz von Holzhausen joined Tesla in 2008, the company wasn't exactly thriving. Nowadays Tesla is making futuristic vehicles with gorgeous designs and using a holistic approach to meet the rising needs of its customers. In February 2019, the Model 3 passed the Chevrolet Volt to become the all-time best-selling electric car in the U.S.

Audi and Hyundai have recently opened new design studios and Toyota has the intention of creating a prototype of the city of the future, where it will test autonomous vehicles. Even traditional companies are shifting their focus towards the iteration method. “Design thinking is about addressing a number of layers in a problem,” says designer Jim Hackett who was hired as CEO by Ford. He announced that he will use design thinking to keep the 100-plus-year-old automaker relevant.

Design thinking has the ability to transform businesses and improve sales. The method can help professionals take their businesses to the next level while saving a lot of money, effort and time in the long run. Any conventional company can turn into a progressive organization when it starts using design thinking. Design is not limited to the look and feel of any product but extends to its functionality. Even simple changes in product presentation or customer experience can enhance the way people see your company.

Because of the pandemic, car sales are booming. As a result, dealers are enjoying record profits and their highest valuations ever. This bonanza, however, temporarily obscures the disruptive effects of digital technologies that, until the pandemic, have progressively driven dealer profits to all-time lows while connecting consumers ever more directly with OEMs. As vehicle supply normalizes over the coming 12-18 months, these disruptive retail trends will return and accelerate.

To prepare for this inevitability, OEMs and dealers must have a retail vision for the future. Taking their cue from Tesla's successful direct-to-consumer retail strategy, a number of EV startups have sponsored new legislation to open up direct-to-consumer channels in 11 states in 2021 alone. Many traditional OEMs are pushing to do the same as they announce their transition from combustion vehicles to EVs.

Dealerships need not fear. Data show that direct-to-consumer models actually enhance dealer sales, not harm them. According to the National Automobile Dealers Association, **dealerships saw a 58% increase in sales** in states with open franchise laws between 2012-2019, where states with closed laws saw only 12% increase during the same period.

Travel and hospitality

Airbnb's rise in the travel industry was possible by improving customer experience. Only a few years ago, the company's sales were dropping. Although they started looking for cracks in the business strategy. It turned out that the listings had low-quality pictures attached to them. When the company replaced the amateur photos with high-quality images, their revenues doubled within a week in 2009.

The company also focused on the user and provided all kinds of product details to help them make an informed buying decision, sales and revenue shot up. In fact, co-founder Joe Gebbia says that it was design thinking that helped the company grow from a struggling startup to a billion-dollar company.

Another success story - Hyatt Hotels connected with the Design School at Stanford University in 2011 to explore the human-centered innovation concepts and later focused on creating caring experiences for both guests and employees. They also turned 10 of their properties into innovation labs, where they experimented with lighting, furniture, and rooms.

At the same time, Crowne Plaza teamed with the design firm IDEO to improve the experience of its business travelers. The result was a free-to-use new meeting and working experience housed in Crowne Plaza lobbies that includes meeting spaces, food, and beverage options, full service, and digital features.

DESING THINKING FOR STARTUPS

Design thinking is one of the most critical tasks of technology products as it conveys the first impression of your product. It should never be overlooked as it boosts the success rate of startups. The CBI Insights has something to say about the top reasons of failure in the startup's ecosystem:

42% of startups fail due to no market need. The idea may be unique and impressive at first glance. But, it is not solving the customer's problem. Design thinking has a role to play in this situation. It is the process of finding the problem and resolving it.

Design thinking uncovers the framework of how to ideate the problem statement and explore the ways to find appropriate solutions. Design thinking for startups is a process of empathize, define, ideate, prototype, validate, and repeat. The classic five phases of design thinking for startups help the founders to build a product that is expected by the end-users.

Why is design thinking efficient?

Design thinking for startups is efficient and increases the success rates because it requires multidisciplinary teams.

The teams together understand the audience and their expectations which is the empathize stage of the process.

- The defined stage goes into the root of the problem rather than just revolving around it. A popular technique used in this is the Why Technique.
- Once the problem is defined, a wide range of solutions is listed in the ideate stage.
- The prototypes are then built and tested by the teams to reach a unique and effective solution.

The process continues until the team reaches a unique and worthy solution to the most common problem, this happens through the rigorous refinement of the ideas.

The entire five-phase process of design thinking for startups can be divided into two parts:

- The problem stage; and
- The solution stage.

The problem stage defines the needs of customers and finds the gaps in the usability of the product. This stage further adds value to by ideating the options to increase usability. Whereas, the solution stage tests and validates the ideas through tools like Agile, Six-Sigma, and Total Quality Management.

The design thinking depends a lot on your ability to differentiate what works and what does not. There is a paradigm shift in the customer needs which triggers the urgency of design thinking right from the early age of startups.

How can early age startups implement design thinking?

For any startup to implement design thinking, it must create a culture. Below are some areas that would help implement design thinking for startups.

Educating the team: Educating the team about the importance of design thinking is the first step towards establishing a design thinking culture.

Encourage everyone: Ensure that everyone follows design thinking. If not, explore ways to encourage them to adapt to the change.

Seek help from design advisors: You can even consider seeking design advisors to reach your design goals. These advisors help the companies to balance the efforts to reach the customer expectations.

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Once you have attained all the above, you will create an ecosystem of design thinkers. Going forward, these design thinkers will help to maintain the culture and inspire the team with new ideas at each stage.

Here are some examples of how startups have used design thinking to arrive at the first versions of their solution.

Airbnb, a startup that was launched in 2009 was about to bust as no one noticed its existence. That was the time when Airbnb was a part of the Y Combinator. The team brainstormed the reason for its failure and came up with a pattern of 40 listings. They sought the problem to be the pictures that didn't convey the reason to pay for the services or rooms. The entire process was a big turning point for the company, the [case study](#) explains in detail about their adaptation of design thinking and making the startup a million-dollar business.

Similarly, **ForestCar** is a startup engaged in car-sharing services on airports. The basic idea of the company is to offer free parking to the car owners at the airport in exchange for renting their car while they're away. Throughout their journey, they have refined their idea using a design thinking approach and were able to pivot their MVP multiple times.

Understanding the needs of the customers in design thinking for startups is the first step towards rooting your foundation. There is a lot more coming in the way of design thinking.

At **Siam**, the first step towards implementing any project is to get our team of analysts to apply the core tenets of design thinking and work with startup founders to arrive at the solution they are looking to build. Have an idea? Get 30 minutes of free consulting today from [Siamcomputing](#).

The design thinking methodology consists of 6 different stages: emphasizing, defining, ideating, prototyping, testing and finally, implementing.

Step 1: Empathize with your audience

Interviews, shadowing, and a non-judgmental approach to understanding help researchers learn about the audience for whom they are finding a solution, in order to fuel the problem definition

Step 2: Define the problem

By creating user personas, listing pain points and objectives, and challenging assumptions with learnings from user research, the next step creates a data-backed point of view built on the user's needs and insights

Step 3: Ideate a solution

In this phase, a lot of brainstorming will happen to come up with a creative solution. Best practices include “Yes and” thinking, ‘diverge and converge’ brainstorming rounds, and prioritization after an idea dump.

Step 4: Prototype your solution

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Create ‘shitty prototypes’ to learn and finetune your creative solution quickly. Depending on your goal, you can use mockups and storyboards, or simple 3D models and paper prototypes to keep it simple. This stage of the process is about editing creating a bare minimum set of functions, or a representation of ideas, that you can test with your audience.

Step 5: Test your prototype

Go back to your audience and test your prototype with them. Ask open questions and role play to understand any impediments to using the problem, or flaws in the solution - as well as what works. Work quickly, fail fast, and return to steps 2 and 3 to refine the problem statement and come up with new solutions based on your insights.

Most entrepreneurs are inherent design thinkers. They are always looking for problems that can be solved and solutions that can be improved. They are empathetic to customers' needs and naturally have a curious mind that allows them to look at things unconventionally. This is how they can come up with business ideas and turn them into sustainable startups.

What is design thinking and how can you implement it in your startup? According to Tim Brown, Executive Chair of IDEO, “Design thinking is a human-centric approach to innovation.” It is a problem-solving mindset that allows you to look at things through your customers' eyes while figuring out meaningful solutions for your business. Here's how to implement the five-stage process of design thinking in your startup.

1. Observe With Empathy

The first step you need to take to implement design thinking in your startup is to start empathizing with your customers, users, and partners. Uber Eats is an example of a startup that is accomplishing its mission of making eating effortless for their customers by implementing design thinking principles.

The company operates in over 500 cities globally and their designers still regularly immerse themselves in walkabout programs and order shadowing to understand what their customers want to eat, how they like to order, and how the restaurants prepare their menu as well as food.

To empathize, you need to interact. Uber Eats designers regularly visit restaurant workers, delivery partners, and sit in their users' homes while ordering their food. If you are working on a new product, you can interview your future customers and watch them use competing products.

By looking at things from your customers' standpoint, your startup can better understand what needs or challenges your customers are facing live and what kind of solutions can work for them.

2. Define The Problem

Once you truly live and understand your customers' problem, you can review your hypotheses and, in many cases, realize that you may need to redefine your problem and approach it from different angles.

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Designers at Uber Eats are encouraged to view their restaurant partners prepare meals and their customers placing orders to define the problems that they may be facing at each step of the food ordering process. It helps them view the problem as not just a logistical one, but also support their conclusions by insights gathered from real customers and partners doing their job.

3. Ideate With Your Team

The next stage of design thinking is to ideate solutions for the problems defined in earlier stages by involving all internal and external team members. Uber Eats involves members from different disciplines to encourage ideation and creativity from different perspectives and experiences. These sessions have led to Uber Eats's virtual restaurants and pooled deliveries.

4. Prototype Rapidly

Features like “Most Popular Items” was originally proposed as an experiment by the Toronto operations team at Uber Eats. After quickly building, releasing and validating the benefit of this feature, designers and developers collaborated to further develop and launch it across global markets.

Speed is key when [developing your prototype](#). A prototype serves to test ideas quickly so you can learn fast and [build your startup idea](#) on a stronger foundation. As a startup founder, it is important to embrace and develop a culture of experimentation in your startup.

5. Test And Validate

Design thinking is an iterative process. Results from your prototype tests can show that you may have misinterpreted customer behavior and needs in steps one and two. Or you may learn that your solution does not address the needs of your customers. This is when you need to go back to the previous steps. However, this time, you will approach the next iteration with an educated eye, which will help you capture the right opportunity, the right way. If not, start again. Eventually, you will inevitably build a successful startup, even if it takes changing ideas.

Design thinking is a powerful tool. If you implement it in your startup, you will be able to win over your customers with sustainable solutions and unlock your startup team's full creative potential.

UNIT-V DESIGN THINKING IN VARIOUS SECTORS

Case Studies in Information Technology, Finance, Education, Management and Retail Sector, Analyze and Prototyping, Usability Testing, Organizing and Interpreting results.

Design Thinking –IT INDUSTRY:

- The Information Technology (IT) industry has been booming across the world since a few decades.
- The industry employs a large number of people across the globe and is the hub for innovation every day.
- The IT industry is now working mostly on **Agile methodology**, which is a technique of project management.
- Agile is **an iterative or incremental method** of managing development and design.
- Each day, the engineers have a set of tasks at hand, which they are required to complete in a day or two.
- Moreover, the complex problems shot by the customers to the engineers are required to be solved quickly. In such a scenario, design thinking helps to solve the problems and address the exact needs of the customer.
- Solving the customers' problems requires an intuitive thinking and understanding by observing exemplary use cases or scenarios.
- Hypotheses and theories are not encouraged. This intuitive understanding is developed by design thinking principles. After getting the problem statement from the client, the engineers are supposed to brainstorm on ideas and suggest solutions to the client

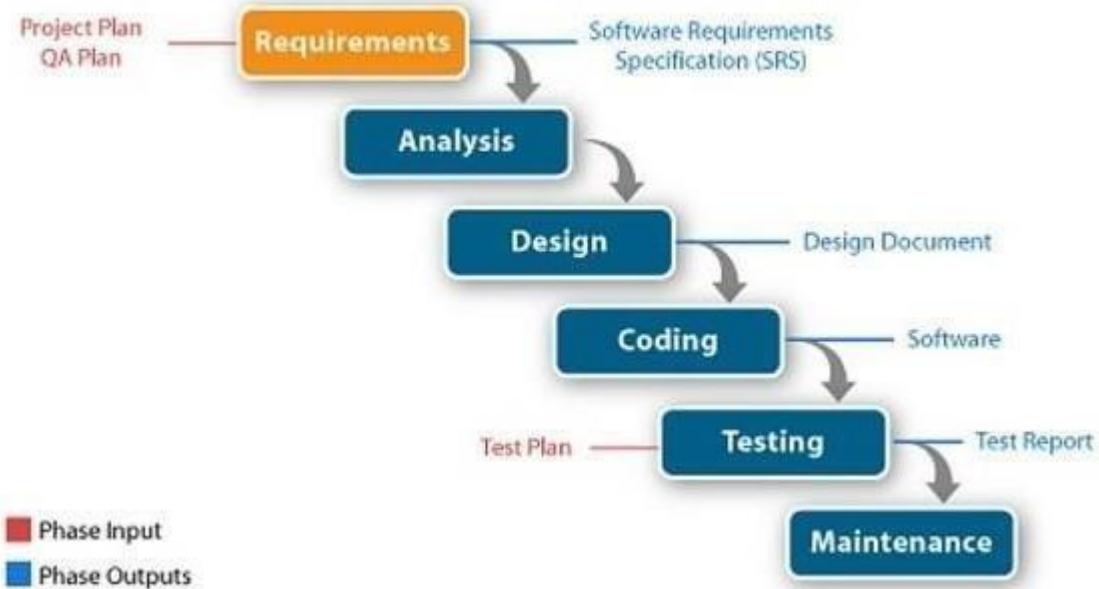
Before ideas can be thought of, it is imperative for the engineers to do an in-depth requirements gathering. This helps to understand the exact needs of the client and also helps to make the analysis and synthesis easier. In a **Waterfall model**, which is different than the Agile model, the process starts with requirements gathering, followed by creating the visual designs and then occurs the development of solution. Testing is the last step in the model. Looking closely, it is similar to the process of design thinking.

The IT engineers today are supposed to understand the problem statement in the exact manner as felt by the client. Otherwise, both the solution and the time invested will fail. Once requirements have been gathered, only then can the developers start thinking of programmatic solutions.

The solutions that are developed are sent for the client's experience. The feedback given by the client helps the designers and developers to iterate the process of software development. Design thinking has been used extensively in IT companies to brainstorm for solutions towards customer's problems. The **advantages of using design thinking in IT industry** for software development are as follows.

- The solutions are prototyped.
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- The solutions are experienced by the client before approval.
- Short iterations are possible to improve the user experience.
- Small cross-functional teams.
- Incremental delivery is possible.
- Fast feedback helps the designers and developers.
- Continuous improvement is possible.

- One of the primary benefits of design thinking in the IT industry is its emphasis on empathy. By putting the user at the center of the design process, IT companies can better understand their customers' needs and develop solutions that meet those needs. This user-centric approach is particularly important in the IT industry, where technology is constantly evolving and user preferences can change quickly.
- Another benefit of design thinking in the IT industry is its emphasis on iteration and rapid prototyping. IT companies can use design thinking to quickly test and refine potential solutions, allowing them to fail fast and learn quickly. This iterative approach is particularly important in the IT industry, where technology is constantly changing and companies need to stay ahead of the curve to remain competitive.
- Design thinking can also help IT companies develop more innovative solutions. By encouraging teams to think outside the box and challenge assumptions, design thinking can help IT companies develop solutions that are truly innovative and disruptive. This is particularly important in the IT industry, where technology is constantly advancing and companies need to stay ahead of the curve to remain competitive.



The use of design thinking principles have grown so much in the IT industry that nowadays world-renowned companies like Infosys have made it mandatory for its employees across the globe to undergo design thinking courses and get certified as a design thinker.

The concept of design thinking is central to the process of developing software solutions, which target the exact needs of the customer and have the flexibility of getting modified in an iteration process based on the feedback given by the client.

One example of how design thinking has been used in the IT industry is in the development of mobile apps. Mobile apps have become a ubiquitous part of our daily lives, and design thinking has played a critical role in their development. By putting the user at the center of the design process, IT companies can create mobile apps that are intuitive, easy to use, and meet the needs of their customers.

Another example of how design thinking has been used in the IT industry is in the development of software applications. Software applications are complex systems that require careful planning and design. Design thinking can help IT companies develop software applications that are user-friendly, efficient, and meet the needs of their customers.

In conclusion, design thinking is a powerful problem-solving methodology that can help IT companies develop user-centered, innovative solutions to complex problems. By putting the user at the center of the design process and emphasizing iteration and rapid prototyping, IT companies can create solutions that meet the needs of their customers and stay ahead of the curve in a constantly evolving industry.

Here are some of the key reasons why design thinking is essential in the IT industry:

User-centered approach: Design thinking is a user-centered approach that focuses on understanding the needs, behaviors, and motivations of the user. This approach helps IT companies to create products and services that are more in line with what their users want, and that are more likely to be successful in the market.

Innovation: Design thinking promotes innovation by challenging traditional ways of thinking and approaching problems. In the IT industry, this means creating new and innovative solutions to problems that may have previously been overlooked or neglected.

Collaboration: Design thinking encourages collaboration among team members and with customers. This approach helps IT companies to create solutions that are more effective and better meet the needs of their users.

Rapid prototyping: Design thinking involves creating prototypes early on in the design process. This approach helps IT companies to quickly test and refine their ideas, and make improvements based on feedback from users.

Risk management: Design thinking can help IT companies to manage risk by identifying potential problems early on in the design process. By testing out prototypes and getting feedback from users, companies can identify potential problems and make changes before investing significant time and resources into the final product.

Competitive advantage: By using design thinking, IT companies can create products and services that differentiate them from their competitors. This can help companies to stand out in a crowded market and attract and retain users.

Customer satisfaction: By focusing on the user experience, design thinking can help IT companies to create products and services that better meet the needs of their users. This approach can lead to increased customer satisfaction, which is essential for building brand loyalty and driving growth.

Emphasis on empathy: Design thinking emphasizes empathy towards users and their needs. IT companies can use this approach to develop products and services that are better aligned with user needs and desires. Understanding user needs and pain points is crucial in the IT industry, where technology solutions are often complex and difficult to use.

Scalability: Design thinking encourages IT companies to design solutions that are scalable and can adapt to changing user needs and market conditions. This is important in the rapidly evolving IT industry, where companies need to stay ahead of the curve to remain competitive.

Flexibility: Design thinking allows IT companies to be flexible and adapt quickly to changing circumstances. This approach encourages companies to experiment and test out new ideas, allowing them to pivot and change direction when necessary.

Simplification: Design thinking emphasizes simplification and streamlining of complex processes and systems. This can help IT companies to create more intuitive and user-friendly products and services, which can lead to increased adoption and user satisfaction.

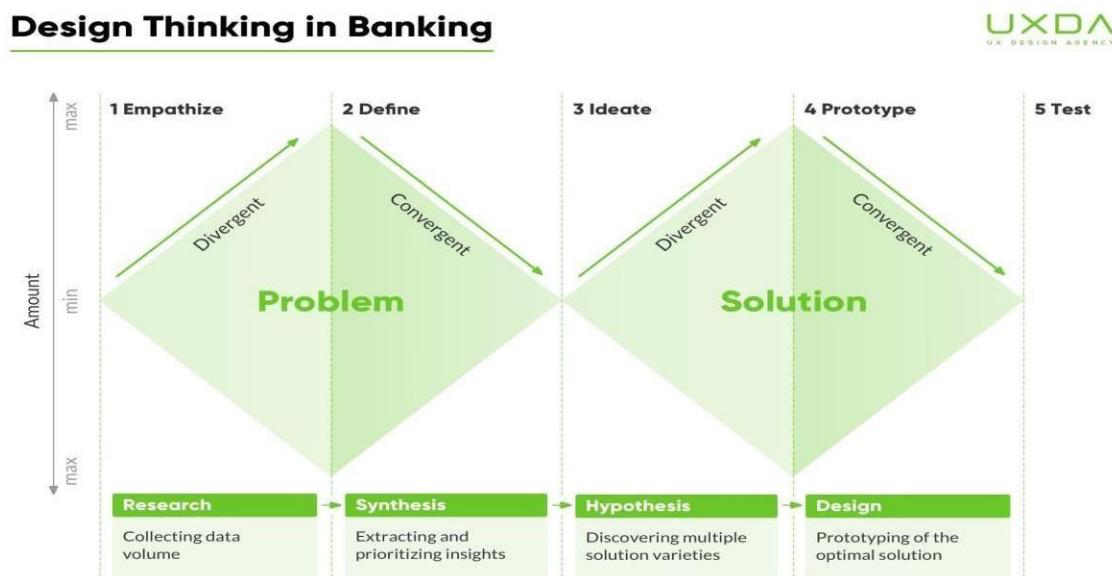
Data-driven decision making: Design thinking involves using data and feedback from users to make informed design decisions. By collecting and analyzing user data, IT companies

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can create solutions that are more in line with user needs and preferences. This approach can also help companies to identify and address potential issues before they become major problems.

Design Thinking –Finance & Banking

- Design Thinking in banking is a powerful process used to architect digital financial products in 5 steps: Empathize, Define, Ideate, Prototype, Test. But it's not that easy, let's explain it through the Double Diamond model.
- The first diamond is known as Problem. It collects data through divergence and prioritizes key insights through convergence. The second diamond is about Solution and starts from diverging all possible solutions based on extracted insights and converging all into a prototype, which, at the end, is tested and delivered according to previously defined criteria.



Stage of design thinking in banking:

Empathize digital banking users

At the Empathize stage, we collect a large amount of data about business goals, customer needs and pain points, and product features, thus researching the wire context around the product. Our aim is to feel and emphasize with the problem we are trying to solve. To achieve this, we need to step into the shoes of the customer and business owner.

Define core user problems and value

At the Define stage, we analyze and synthesize collected data to define the core problems and prioritize key data. The main purpose is to understand what value we could bring to customers and why they would prefer it over other solutions. To achieve this, we need to approach data analysis from these different angles: business, psychology, user behavior, competitors, marketing, technology, etc.

Ideate digital banking solution

At the Ideate stage, we start to generate multiple hypotheses about what our solution could be. Our main goal is to uncover the best way to solve the previously defined problems. To achieve this, we need to step out of the box and create dozens of potential solutions.

Prototype digital banking product

At the Prototype stage, we take dozens of previously generated ideas about how our end solution could look and work, moving toward designing the final version. We check all the solutions based on previously generated user scenarios, business goals, etc. at the Synthesis stage. In this way, we narrow down multiple solutions into one or more that are delivered as visual prototypes and could be tested by users and business owners.

Test banking prototype

The final Test stage is needed to ensure that our visual prototype provides the needed solution according to the previously defined problem. If it is not, we then return to the first stage and repeat the process.

One of the most important areas where design thinking is being applied in the finance and banking industry is in the development of new products and services. By applying design thinking principles, financial institutions can develop products and services that are user-centric and meet the needs of their customers. This approach can lead to the creation of new financial products that are more innovative and better suited to the needs of consumers.

Another area where design thinking is being applied in the finance and banking industry is in the digitalization of banking services. Many financial institutions are looking to digitalize their services in order to provide a more convenient and efficient customer experience. Design thinking can be used to develop user-friendly digital interfaces that make banking services easier to use and more accessible to a wider range of consumers.

In addition, design thinking is also being applied in the finance and banking industry to improve customer experience. By understanding the needs and expectations of their customers, financial institutions can develop strategies to improve the overall customer experience. This can include simplifying complex financial processes, improving customer service, and providing more personalized financial advice.

Here are some of the benefits of using design thinking in finance and banking:

Customer-centric approach: Design thinking is a customer-centric approach to problem-solving. In the finance and banking industry, this means putting the needs of the customer at the center of product and service design. By understanding the needs and behaviors of customers, banks can create products and services that better meet their needs.

Innovation: Design thinking encourages innovation by challenging traditional ways of thinking and approaching problems. By using design thinking, banks can create new and innovative solutions to problems that may have previously been overlooked or neglected.

Collaboration: Design thinking promotes collaboration among team members and with customers. By involving a diverse range of stakeholders in the design process, banks can create solutions that are more effective and better meet the needs of customers.

Iterative process: Design thinking is an iterative process that involves testing and refining ideas through multiple iterations. This approach allows banks to test out new ideas and make improvements based on feedback from customers.

Risk management: Design thinking can help banks to manage risk by identifying potential problems early on in the design process. By testing out prototypes and getting feedback from customers, banks can identify potential problems and make changes before investing significant time and resources into the final product.

Efficiency: Design thinking can help banks to create more efficient processes and products. By identifying pain points and areas of inefficiency, banks can create solutions that streamline processes and improve the overall customer experience.

Competitive advantage: By using design thinking, banks can create products and services that differentiate them from their competitors. This can help banks to stand out in a crowded market and attract and retain customers.

Rapid prototyping: Design thinking involves creating prototypes early on in the design process. This approach helps financial institutions to quickly test and refine their ideas, and make improvements based on feedback from customers.

Risk management: Design thinking can help financial institutions to manage risk by identifying potential problems early on in the design process. By testing out prototypes and getting feedback from customers, companies can identify potential problems and make changes before investing significant time and resources into the final product.

Regulatory compliance: The finance industry is heavily regulated, and design thinking can help financial institutions to ensure that their products and services are compliant with regulatory requirements. By involving compliance experts in the design process, companies can identify potential compliance issues early on and make necessary changes.

One example of how design thinking has been used in the finance and banking industry is the development of **mobile banking apps**. These apps have become an important tool for consumers who want to manage their finances on the go. By using design thinking principles, financial institutions can develop mobile banking apps that are easy to use, secure, and provide a range of features that meet the needs of their customers.

Another example of how design thinking is being applied in the finance and banking industry is the development of **new financial products**. Many financial institutions are using design thinking principles to develop new financial products that meet the needs of consumers. For example, some institutions are developing financial products that are specifically designed for millennials or for people who are new to investing.

In conclusion, design thinking has become an important approach in the finance and banking industry. It is being used to develop new products and services, digitalize banking services, and improve customer experience. By applying design thinking principles, financial

institutions can create more innovative, user-centric solutions that meet the evolving needs of their customers.

Design Thinking in Higher Education Management Programmes

- Design thinking is becoming an increasingly essential tool in higher education management programmes. Institutions are recognizing the value of this approach in creating innovative solutions that better serve the needs of students, faculty, and staff. One example of this is the General Management for IT Professionals Programme offered by the top-ranked B-School, IIM Kozhikode, which integrates design thinking concepts into its curriculum.
- The programme is aimed at IT professionals, business students, managers, and executives seeking to pursue business administration general management programs. By incorporating design thinking, the course teaches participants to develop progressive concepts of product development that fulfill present and future customer requirements. This focus on customer needs is a central tenet of design thinking and is key to creating solutions that meet the needs of stakeholders.
- The programme also aims to develop participants' design thinking skills, which they can use to refine the product life cycle and promote business growth. This focus on design thinking is crucial in a rapidly evolving business environment, where innovation and adaptability are essential for success. The skills and techniques learned through design thinking can help organizations to stay ahead of the curve and remain competitive.
- One of the ways in which the programme incorporates design thinking is through its content, which covers design-based topics such as innovation, design management, integrated thinking, and a human-centered design approach. These concepts provide participants with a deep understanding of design thinking and its potential applications in a variety of settings.
- By exposing participants to design thinking concepts, the General Management for IT Professionals Programme at IIM Kozhikode is helping to create a new generation of leaders who are equipped to tackle the challenges of a rapidly changing business environment. These leaders are able to think creatively and use design thinking to develop innovative solutions that better serve the needs of their stakeholders.
- In conclusion, design thinking is an integral part of modern higher education management programmes. By incorporating design thinking concepts into their curricula, institutions can help participants to develop the skills and techniques needed to create innovative solutions that meet the needs of stakeholders.
- The General Management for IT Professionals Programme offered by IIM Kozhikode is just one example of how institutions are using design thinking to create a new generation of leaders who are equipped to tackle the challenges of the future.
- By using design thinking in higher education management programmes, institutions can create solutions that are more effective, efficient, and stakeholder-friendly. This can lead to increased student and faculty satisfaction, as well as improved administrative processes.
- In addition, design thinking can also help higher education institutions to differentiate themselves from their competitors. By creating innovative solutions to challenges faced

by students and faculty, institutions can stand out in a crowded market and attract and retain top talent.

Here are some of the key reasons why design thinking is essential in higher education management programmes:

Innovation: Design thinking promotes innovation by challenging traditional ways of thinking and approaching problems. In the field of higher education, this means creating new and innovative solutions to challenges faced by students, faculty, and administrators.

Student-centered approach: Design thinking focuses on understanding the needs, behaviors, and motivations of users. In the field of higher education, this approach can help institutions to create programmes and services that are more aligned with what their students want and need, leading to increased student satisfaction and retention.

Collaboration: Design thinking encourages collaboration among team members and with stakeholders. In the field of higher education, this approach helps institutions to create solutions that are more effective and better meet the needs of their students, faculty, and staff.

Rapid prototyping: Design thinking involves creating prototypes early on in the design process. This approach helps institutions to quickly test and refine their ideas, and make improvements based on feedback from stakeholders.

Problem-solving: Design thinking provides a structured approach to problem-solving that can be applied to a wide range of challenges faced by higher education institutions. By using this approach, institutions can identify potential problems early on and develop effective solutions.

Continuous improvement: Design thinking encourages continuous improvement by emphasizing the importance of feedback and iteration. In the field of higher education, this approach can help institutions to continually refine their programmes and services based on feedback from stakeholders.

Differentiation: By using design thinking, higher education institutions can differentiate themselves from their competitors. This can help institutions to stand out in a crowded market and attract and retain students, faculty, and staff.

Design thinking is increasingly being used in higher education management programmes as a structured approach to problem-solving that focuses on user needs and behaviors. This approach can help institutions to create innovative solutions to challenges faced by students, faculty, and administrators.

10 Ways How Design Thinking Has Changed the Business Management World

Design thinking in higher education pedagogy has contributed in the following ways to changing the business management world.

- **Innovative Learning**

The design thinking education approach introduces innovative techniques in imparting design-based learning to higher education students. It provides a platform that encourages them to think out-of-the-box and generate novel ideas for accelerated business growth. It builds design thinking skills and prepares them for the entrepreneurial world.

- **Customer-Centric Approach**

The principles of design thinking create value by adopting an organized customer-centric innovation approach in the business. It empathizes with the customer pain areas, identifies their probable needs, and quantitatively translates them into new product specifications for enhanced value creation. The focus is on providing an enriched customer experience and driving business growth.

- **Creates Solutions**

Design thinking management theories included in a IIM Kozhikode – General Management for IT Professionals Programme provide problem-solving and design-based learning methodologies to students for product development. They design and propose solutions that are practical, experiential, and serve the demands of the customers.

- **Designs Prototype**

The design management courses aid the product development managers in creating a prototype business model. It builds a modular architecture for designing new and innovative products and improving existing ones.

- **Financial Analysis**

Design thinking ideologies analyze and assess the financial viability of the product development idea. They align the expected economic returns of the new project to the long-term profitability goals of the business to measure its worth. Financial analysis is a core skill taught by top-tier B School, IIM Kozhikode- General Management for IT Professionals Programme.

- **Integrative Thinking**

The General Management for IT Professionals Programme facilitate business practitioners to develop and integrate their innovative and design-thinking capabilities with business principles. The integrated thinking approach helps them find creative solutions to business challenges and transform them into growth opportunities.

- **Creative Organizational Culture**

Design thinking hones the imaginative skills of senior managers and team leaders. It takes them to the path of creating and sustaining a productive organizational culture, promoting innovative learning practices at all levels.

- **Action Learning Project**

Individuals and teams collaborate in design-thinking-based action learning projects to realize organizational goals. They learn the core concepts of design thinking and explore opportunities for its practical applications in diverse fields through IIM Kozhikode – General Management for IT Professionals Programme.

- **Optimizes Corporate Structure**

Design thinking framework optimizes and aligns the internal corporate structure or culture with the external brand proposition in the market. It fosters the agility, creativity, and efficiency of internal processes. The results are reflected in the external credibility with the customers in the form of brand loyalty.

- **Gamified Learning Technique**

In the pursuit to incorporate design thinking modules in business and management courses, higher education institutes are now providing a gamified learning environment to the students in both classroom and online modes. It provides them with a framework that stimulates new ideation, brainstorming, and peer evaluation. Students collaborate as teams and learn from each other. These techniques are a part of the IIM Kozhikode – General Management for IT Professionals Programme.

Design Thinking in retail sector

- applying design thinking with five key strategies for retail IT solutions.

1) Fuse products to create new and better ones

- Fusion will be the key to creating next generation, futuristic designs. For example, engineers and apparel designers can partner with each other to create wearable devices that can be embedded into fashionable apparel.
- Design thinking is essential to support such collaboration. Take for example, The Heddeko Smartshirt that keeps information in 3D. It indicates if you are putting too much pressure on a certain part of your body.

2) Provide enhanced experience during customer interactions s

- Design Thinking can enable retailers to truly understand the how, when and what to provide satisfying experience during customer interactions. It could be in terms of training store managers and staff to be sensitive and alert to customer asks or simply analyzing real reasons of basket abandonment. Even small events like a reliable return policy can enrich customer experience.

3) Improve screen design

- The screens customers are accustomed to today may change significantly tomorrow. So much so that we could ask if there will even be a need for a screen or if it will give way to augmented reality or a virtual screen? New concepts, navigational skills, and designs will define these virtual screens. How can retailers use the revolutionary screens to their advantage? For instance, they could project a 3D image of their product on the customers palm. Simulative design will allow customers to hold the product and evaluate its dimensions before making a purchase decision.

4) Create brand value

- Retailers will compete and win based on the extent of personalization they offer to customers based on market intelligence. Companies that intuitively understand and design products and experiences that are in line with market expectations are more likely to build mind and market share and have a sustainable brand value.
- Companies like Google, Apple, Facebook which are one of the topmost in brand value have been innovating and launching products, features and solutions that are immediately accepted by customers as delightful experience.

5) Revive brick and mortar stores

Several retailers are concerned about stores losing their relevance due to the growth of online and mobile retailing. Design thinking can play an important role in reviving brick and mortar stores and retaining its relevance. Creative and immersive in-store designs and layouts can attract customers. Virtual reality experiences, innovative ways of personalizing services, and special store-driven loyalty programs are just some of the ways to make the store experience exciting and rewarding for customers through the use of design thinking..

One of the primary benefits of design thinking in the retail sector is its focus on empathy. By putting the customer at the center of the design process, retailers can gain a better understanding of their customers' needs and preferences. This approach can help retailers develop more user-centric solutions that meet the needs of their customers and improve the overall shopping experience.

Another benefit of design thinking in the retail sector is its emphasis on prototyping and iteration. Retailers can use design thinking to quickly test and refine potential solutions, allowing them to fail fast and learn quickly. This iterative approach can help retailers develop solutions that are more innovative and better suited to the needs of their customers.

Design thinking can also help retailers improve their store layouts and product displays. By applying design thinking principles, retailers can develop more efficient and effective store

layouts that make it easier for customers to find what they are looking for. This can help retailers improve the overall shopping experience and increase customer satisfaction.

Here are some of the key reasons why design is important in these industries:

Branding: Design is critical to establishing a strong brand identity. In both management and retail, a strong brand identity is essential for creating a consistent and recognizable image that customers can connect with. Effective design can help to communicate the brand's values and personality, and create a sense of trust and loyalty among customers.

User experience: Design is crucial for creating a positive user experience. In the retail sector, this means creating an environment that is comfortable, attractive, and easy to navigate. In management, it means creating a work environment that is conducive to productivity, collaboration, and employee satisfaction. Effective design can help to improve the overall experience for customers, employees, and other stakeholders.

Differentiation: Design can help businesses to stand out in a crowded market. In both management and retail, effective design can help businesses to differentiate themselves from their competitors by creating unique and innovative solutions that meet the needs of their customers.

Efficiency: Design can help to streamline processes and increase efficiency. In management, effective design can help to create workflows that are optimized for productivity and collaboration. In retail, design can help to create store layouts and displays that make it easier for customers to find what they need and make purchases quickly.

Innovation: Design is essential for driving innovation. In both management and retail, innovative design can help to create new and better products, services, and processes that can help businesses to stay ahead of the curve and respond to changing customer needs.

Sustainability: Design can help businesses to reduce their environmental impact and improve their sustainability. In both management and retail, effective design can help to create more sustainable products and processes, reduce waste, and promote environmental stewardship.

Analyze and Prototyping:

Analyzing and prototyping are two critical steps in the design thinking process that help teams create user-centered, innovative solutions to complex problems. Analyzing involves gathering data, synthesizing insights, and identifying patterns and opportunities, while prototyping involves building and testing tangible representations of potential solutions. In this article, we will discuss the importance of analyzing and prototyping in the design thinking process, and how they can be used to create effective solutions.

Analyzing:

In the analyzing stage of the design thinking process, teams gather data from a variety of sources, including user research, market research, and industry trends. This data is then analyzed and synthesized to identify patterns, opportunities, and challenges. The goal of analyzing is to gain a deep understanding of the problem and the people who will be impacted by the solution.

To analyze the data, teams use a variety of techniques, including affinity mapping, thematic analysis, and stakeholder mapping. Affinity mapping involves organizing data into

groups based on common themes, while thematic analysis involves identifying recurring themes in the data. Stakeholder mapping involves identifying the different stakeholders involved in the problem and analyzing their needs and perspectives.

Once the data has been analyzed, teams develop user personas and journey maps to better understand the users' needs and experiences. User personas are fictional characters that represent different types of users, while journey maps visualize the user's experience as they interact with the solution.

Analyzing is a critical step in the design thinking process as it allows teams to gain a deep understanding of the problem and the people who will be impacted by the solution. By analyzing the data, teams can identify patterns and opportunities that can inform the design process, and develop a more comprehensive understanding of the problem and the users' needs.

The importance of analyzing in design thinking:

Analyzing is a crucial step in the design thinking process as it helps teams gain a deep understanding of the problem they are trying to solve and the people they are trying to serve. By gathering data from a variety of sources such as user research, market research, and industry trends, teams can synthesize insights and identify patterns and opportunities that can inform the design process. These insights can then be used to develop user personas, journey maps, and design requirements that serve as guiding principles for the design process.

Furthermore, analyzing helps teams identify gaps and challenges in the current situation, which can lead to innovative solutions. By examining the current state of affairs and identifying pain points, teams can develop creative solutions that meet the needs of users in new and unexpected ways. By analyzing data from a variety of sources and synthesizing insights, teams can develop a more comprehensive understanding of the problem and the people they are designing for, which can lead to more effective solutions.

Prototyping in design thinking:

In the prototyping stage of the design thinking process, teams build and test low-fidelity prototypes to quickly test and refine potential solutions. Prototyping allows teams to learn what works and what doesn't, and make adjustments accordingly. Prototyping also allows teams to gather feedback from users early in the design process and iterate quickly.

The first step in prototyping is to create low-fidelity prototypes using tools such as sketches, wireframes, or cardboard models. These low-fidelity prototypes are quick and easy to create, and allow teams to test a range of potential solutions without investing too much time or resources. Once a potential solution has been identified, teams move on to high-fidelity prototypes, which are more detailed and interactive.

Testing is a critical component of the prototyping stage. By testing the prototypes with users, teams can gain valuable insights into how users interact with the design, what works well, and what needs to be improved. This feedback can then be used to refine the design and create a final product that meets the needs of users.

Prototyping can take many forms, depending on the needs of the project. Some common prototyping techniques include paper prototyping, which involves creating sketches or drawings of the solution, and digital prototyping, which involves using tools such as Adobe XD or Sketch

to create interactive prototypes. Regardless of the technique used, the key is to create a tangible and interactive representation of the solution that can be tested with users.

Prototyping is a critical step in the design thinking process as it allows teams to test and refine potential solutions in a tangible and interactive way. By building and testing prototypes, teams can quickly learn what works and what doesn't, and make adjustments accordingly. Prototyping allows teams to fail fast and learn quickly, which can lead to more effective and innovative solutions.

There are several benefits to prototyping in the design thinking process. First, prototyping helps to bring ideas to life in a tangible way. This can make it easier for design thinking teams to communicate their ideas to stakeholders and to get buy-in for their designs. By building a prototype, design thinking teams can show stakeholders what the final product or service might look like and how it might work.

Second, prototyping allows design thinking teams to test and iterate on their ideas quickly. By building a prototype, teams can get feedback from users and stakeholders on the design of the product or service. This feedback can be used to refine the design and improve the overall user experience.

Third, prototyping allows design thinking teams to explore different design options. By building a prototype, teams can test out different design options and see which one works best. This can help teams to identify the most effective design and to avoid wasting time and resources on designs that do not work.

There are several types of prototypes that can be used in the design thinking process. Low-fidelity prototypes, such as sketches or paper prototypes, are quick and easy to create and can be used to test basic concepts. High-fidelity prototypes, such as functional prototypes or simulations, are more complex and can be used to test more advanced concepts.

The importance of prototyping in design thinking:

Prototyping is a critical step in the design thinking process as it allows teams to test and refine potential solutions in a tangible and interactive way. By building and testing prototypes, teams can quickly learn what works and what doesn't, and make adjustments accordingly. Prototyping allows teams to fail fast and learn quickly, which can lead to more effective and innovative solutions.

Additionally, prototyping allows teams to gather feedback from users early in the design process. By testing prototypes with users, teams can gain valuable insights into how users interact with the design, what works well, and what needs to be improved. This feedback can then be used to refine the design and create a final product that meets the needs of users.

Prototyping can take many forms, from low-fidelity sketches and wireframes to high-fidelity interactive prototypes. The key is to create a representation of the solution that is tangible and interactive enough to test with users, but not so detailed that it takes too long to create or limits the team's ability to iterate quickly. By creating multiple prototypes at different stages of the design process, teams can test and refine their solutions before investing time and resources in developing a final product.

The design thinking process for analyzing and prototyping:

The design thinking process for analyzing and prototyping can be broken down into several stages. These stages include:

Gather data: Teams gather data from a variety of sources, including user research, market research, and industry trends. This data is analyzed to identify patterns and opportunities that can inform the design process.

Synthesize insights: Teams synthesize the data to develop user personas, journey maps, and design requirements that serve as guiding principles for the design process.

Ideate: Teams generate a range of potential solutions that address the insights and design requirements identified in the previous stages.

Prototype: Teams build and test low-fidelity prototypes to quickly test and refine potential solutions.

Test: Teams test the prototypes with users to gain feedback and insights into how users interact with the design.

Refine: Teams use the feedback and insights gained from testing to refine the design and create a more effective solution.

Develop final product: Teams develop a final product based on the refined prototype and feedback from users.

Usability Testing

- Usability testing refers to evaluating a product or service by testing it with representative users. Typically, during a test, participants will try to complete typical tasks while observers watch, listen and takes notes.
- The goal is to identify any usability problems, collect qualitative and quantitative data and determine the participant's satisfaction with the product.
- To run an effective usability test, you need to develop a solid test plan, recruit participants , and then analyze and report your findings.
- Usability testing is a critical step in the design thinking process. It involves testing a prototype or a product with users to determine its usability, effectiveness, and efficiency in achieving its intended purpose. Usability testing is an essential part of the design thinking process as it helps to validate the assumptions made during the ideation stage, and to ensure that the final design meets the needs of the target audience. In this article, we will discuss the importance of usability testing in design thinking, and how it can be conducted effectively.

The importance of usability testing in design thinking:

Usability testing is a critical step in the design thinking process for several reasons. Firstly, it helps to validate the assumptions made during the ideation stage. By testing the prototype or the product with users, the design team can gain insights into how well the design meets the needs of the target audience. This feedback can then be used to refine the design, and to ensure that it is effective and efficient in achieving its intended purpose.

Secondly, usability testing helps to identify potential usability issues before the design is implemented. By testing the prototype with users, the design team can identify potential usability issues that may have been overlooked during the design process. This can include issues such as poor navigation, confusing layouts, or unclear instructions. By identifying these issues early in the design process, the team can make adjustments to improve the user experience, and to ensure that the final design meets the needs of the target audience.

Thirdly, usability testing helps to ensure that the final design is user-friendly and effective. By testing the prototype with users, the design team can gain insights into how the design is perceived by the target audience. This feedback can then be used to refine the design, and to ensure that it is user-friendly, effective, and impactful.

Conducting effective usability testing:

To conduct effective usability testing, the design team should follow several best practices. Firstly, they should define the goals of the usability testing. This involves identifying the questions that the team wants to answer through the testing process, such as how easy the design is to use, how well it meets the needs of the target audience, and how effective it is in achieving its intended purpose.

Secondly, the design team should recruit representative users for the testing process. This involves identifying the target audience for the design, and recruiting users who match the characteristics of this audience. This can include factors such as age, gender, education level, and experience with similar products or services.

Thirdly, the design team should prepare a testing script or a set of tasks for the users to complete during the testing process. This can involve providing users with a set of scenarios or use cases that simulate real-world usage of the design, and asking them to complete these tasks while providing feedback on their experience.

Fourthly, the design team should observe and record the testing process. This involves observing the users as they interact with the prototype, and recording their feedback and observations. This feedback can then be used to identify potential usability issues, and to make adjustments to the design to improve the user experience.

Fifthly, the design team should analyze the feedback and observations collected during the testing process. This involves synthesizing the feedback and identifying key themes and patterns. This feedback can then be used to refine the design, and to ensure that it meets the needs of the target audience.

Overall, usability testing is a critical step in the design thinking process. By validating assumptions, identifying potential usability issues, and ensuring that the final design is user-friendly and effective, usability testing helps to ensure that the design meets the needs of the target audience and achieves its intended purpose. By following best practices for usability testing, the design team can ensure that the testing process is effective and yields actionable insights that can be used to improve the design.

Benefits of Usability Testing

Usability testing lets the design and development teams identify problems before they are coded. The earlier issues are identified and fixed, the less expensive the fixes will be in terms of both staff time and possible impact to the schedule. During a usability test, you will:

- Learn if participants are able to complete specified tasks successfully and
- Identify how long it takes to complete specified tasks
- Find out how satisfied participants are with your Web site or other product
- Identify changes required to improve user performance and satisfaction
- And analyze the performance to see if it meets your usability objectives

You Do Not Need a Formal Lab

Effective Usability Testing does not require a formal usability lab for testing. You can do effective usability testing in any of these settings:

- Fixed laboratory having two or three connected rooms outfitted with audio-visual equipment
- Room with portable recording equipment
- Room with no recording equipment, as long as someone is observing the user and taking notes
- Remotely, with the user in a different location (either moderated or unmoderated)

Factors Affecting Cost

Your testing costs depend on

- Type of testing performed
- Size of the team assembled for testing
- Number of participants for testing
- Number of days you will be testing

Remember to budget for more than one usability test. Building usability into a Web site (or any product) is an iterative process. Consider these elements when budgeting for usability testing:

- **Time:** You will need time to plan the usability test. It will take the usability specialist and the team time to become familiar with the site and pilot test the test scenarios. Be sure to budget in time for this test prep as well as running tests, analyzing the data, writing the report, and presenting the findings.
- **Recruiting Costs:** Consider how or where you will recruit your participants. You will either need to allow for staff time to recruit or engage a recruiting firm to schedule participants for you based on the requirements.
- **Participant Compensation:** If you will be compensating participants for their time or travel, factor that into your testing budget.
- **Rental Costs:** If you do not have monitoring or recording equipment, you will need to budget for rental costs for the lab or other equipment. You may also need to secure a location for testing, a conference room for example, so consider this as well.

Organization and interpreting results in design thinking:

Organizing and interpreting results is a crucial step in the design thinking process as it helps to turn insights and feedback into actionable next steps for the design team. Here are some key strategies for organizing and interpreting results in design thinking:

Synthesize insights: After conducting user research and testing, it's important to synthesize the insights gathered into key themes and patterns. This can involve sorting through qualitative data such as user interviews, observation notes, and feedback, and grouping them into common themes or personas.

Prioritize opportunities: Once the insights have been synthesized, the team can prioritize opportunities for improvement or innovation. This can involve defining problem statements or design challenges that the team wants to tackle, and selecting the most promising areas to focus on.

Ideate potential solutions: With a clear understanding of the problem statement or design challenge, the team can begin to generate potential solutions through ideation sessions. This can involve brainstorming, sketching, or prototyping potential solutions that address the identified user needs and pain points.

Prototype and test: Once potential solutions have been developed, the team can create prototypes and conduct user testing to gather feedback and refine the designs. This process of prototyping and testing can be repeated several times until a final solution is developed.

Iterate and refine: Design thinking is an iterative process, and the team should be prepared to revisit previous stages of the process as new insights emerge. This can involve refining existing solutions, generating new ideas, or testing alternative approaches until a desirable and viable solution is achieved.

The first stage of organizing and interpreting results in design thinking involves synthesizing insights. After conducting user research and testing, the team will have gathered a large amount of qualitative data, such as user interviews, observation notes, and feedback. The first step in organizing and interpreting these results is to sift through the data and identify key themes and patterns. This can involve reviewing the data multiple times to identify insights and group them into common themes or personas.

Once the insights have been synthesized, the team can move on to the second stage of organizing and interpreting results, which is to prioritize opportunities. At this stage, the team will have identified the most pressing user needs and pain points, and will have developed an understanding of the context in which these issues arise. The next step is to define problem statements or design challenges that the team wants to tackle, and to select the most promising areas to focus on. This can involve prioritizing opportunities based on the potential impact on the user experience, the feasibility of implementation, and the alignment with the team's goals and values.

The third stage of organizing and interpreting results is to ideate potential solutions. This stage involves generating a wide range of ideas and concepts that address the identified user needs and pain points. This can involve brainstorming sessions, sketching or prototyping potential solutions, or conducting user workshops to generate feedback and ideas. The aim of this stage is to encourage creativity and open-mindedness, and to generate as many ideas as possible, without judging them prematurely.

The fourth stage of organizing and interpreting results in design thinking is to prototype and test potential solutions. Once the team has developed a range of potential solutions, the next step is to create prototypes that simulate the user experience of using the solution. This can involve creating low-fidelity prototypes, such as sketches or paper prototypes, or high-fidelity prototypes, such as digital or physical prototypes. Once the prototypes have been created, the team can conduct user testing to gather feedback and refine the designs. This stage is crucial, as it enables the team to validate their assumptions about user needs and preferences, and to identify potential flaws in the design before it is implemented.

The final stage of organizing and interpreting results in design thinking is to iterate and refine. This stage involves repeating the ideation, prototyping, and testing stages until a desirable and viable solution is achieved. It is at this stage that the team can refine their designs based on user feedback and insights, and can make adjustments to improve the user experience. The aim of this stage is to continuously improve the solution until it meets the needs of the target audience and achieves the team's goals.

Organizing the results of design thinking research is important to make sense of the data collected during the research phase. This data can come from a variety of sources, including user research, customer feedback, and market analysis. Design thinking teams need to organize this data to identify patterns, insights, and opportunities for innovation.

One approach to organizing the data is to use tools such as affinity diagrams or mind maps. Affinity diagrams are used to group similar ideas or concepts together, while mind maps are used to visualize connections between different ideas or concepts. These tools can help design thinking teams identify patterns and connections in the data, which can lead to insights that inform the design of new solutions.

Interpreting the results of design thinking research is also critical to developing effective solutions. Design thinking teams need to make sense of the data collected during the research phase to identify key insights and opportunities for innovation. This process involves analyzing the data to identify patterns, trends, and customer needs.

One way to interpret the results of design thinking research is to develop personas. Personas are fictional representations of the different types of customers that a design thinking team is targeting. They help teams understand the needs, motivations, and behaviors of their customers, which can inform the design of new solutions.

Another way to interpret the results of design thinking research is to develop customer journey maps. Customer journey maps help design thinking teams understand the different touchpoints that customers have with their products or services. This can help teams identify pain points in the customer experience and opportunities to improve the overall customer experience.

In conclusion, organizing and interpreting the results of design thinking research is critical to the success of the design thinking process. By using tools such as affinity diagrams and mind maps, and by developing personas and customer journey maps, design thinking teams can make sense of the data collected during the research phase and develop insights that inform the design of new solutions.

Here are some of the key reasons why design thinking is essential:

One of the most significant benefits of design thinking is that it encourages organizations to take a human-centered approach to problem-solving. By focusing on the needs of their customers and stakeholders, organizations can create solutions that are tailored to their specific requirements. This approach helps organizations to develop a deeper understanding of their customers and build stronger relationships with them, which can lead to increased loyalty and satisfaction.

Design thinking also encourages organizations to experiment with new ideas and solutions. By prototyping and testing ideas, organizations can quickly identify what works and what doesn't, and refine their solutions accordingly. This iterative approach helps organizations to be more agile and responsive to changes in their environment.

Design thinking can also help organizations to break down silos and encourage cross-functional collaboration. By involving people from different departments and backgrounds in the design thinking process, organizations can foster a culture of innovation and creativity. This approach can lead to new ideas and solutions that would not have been possible otherwise.

Another significant benefit of design thinking is that it helps organizations to visualize data and insights effectively. By using visual tools such as diagrams, charts, and graphs, organizations can communicate complex information in a more accessible and compelling way. This approach can help stakeholders to understand the implications of data and insights and make informed decisions based on them.

Overall, organizing and interpreting results is a crucial part of the design thinking process. By synthesizing insights, prioritizing opportunities, ideating potential solutions, prototyping and testing, and iterating and refining, the design team can develop innovative solutions that meet the needs of the target audience and improve the user experience. By taking a human-centered

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approach to design, and by continuously testing and iterating their solutions, the team can create designs that are user-friendly, effective, and impactful.

CONTENT BEYOND SYLLABUS

DESIGN THINKING FOR SERVICE DESIGN

How To Design a Service

Service design is all about taking a service and making it meet the user's and customer's needs for that service. It can be used to improve an existing service or to create a new service from scratch. In order to adapt to service design, a UX designer will need to understand the basic principles of service design thinking and be able to focus on them when creating services. When it comes to service design - it can help to remember that "A design isn't finished until somebody is using it." Brenda Laurel, designer at MIT.

Step 1: Align Vision and Goal

- This step is the starting point of a service design process. It decides how the service fits into the strategy of the company.
- A project may run too far ahead of the company due to ambitious working and innovations, and comparing them with the company's vision statement and core goals can help the project team realign the service with the company's desired outcomes.
- Here is how you can align a service with the company's image and values: Situate a product or service in the overall vision statement of the company.
- Think of ways how designing a service supports the company's goals in the best possible manner.

Step 2: Brainstorm

- The next step is to place a creative and hard working team to sustain this vision and provide it a common space to work together, brainstorm and share ideas.
- Coming with ideas is easy and hundreds of ideas can be generated in very little time; however, execution tests the practicality of an idea. Solid, workable, and practical ideas tend to get buried under the rubble of the mediocre ones.

Step 3: Conduct a Market Analysis

- Before a new service is launched or an improvement is being made in the existing one, extensive research needs to be done to situate the service in a context.

Step 4: Identify Barriers and Limitations

This is one of important steps of the service design process as it helps you put your ambitious ideas into the realistic realm.

Allow all team members to critically evaluate their own ideas and of others and identify weaknesses and kinks and iron them out.

Step 5: Establish a User Profile/Personas

Develop different types of fictitious personas or user profiles of your users.

Think about what your users do; where do they live; what do they do, etc; and endow them character traits accordingly.

Step 6: Prototype and Test

You can test prototypes of a service on your employees as well as engage a few real users. Here

is how you should go about it: Create mockups to create something as close as possible to the real environment. Define the contact points at which the users will come across your service. Develop a stepwise procedure of how they will interact with your service.

Step 7: Evaluate Users' Experience

. Gather insights from the users about the service features that made the users happy and created moments of delight for them.

Inquire the users about the service features, which they found off putting.

Step 8: Get Feedback, Improve the Service, & Evolve

The Evolution step is the final phase of the service design process that is from conceptualization towards recommendation. Service Design is a cyclic process and means gathering feedback and feeding it forward.

PRINCIPLES OF SERVICE DESIGN

The general principles of service design are:

- Services should be designed based on a genuine comprehension of the purpose of the service, the demand for the service and the ability of the service provider to deliver that service.
- Services should be designed based on customer needs rather than the internal needs of the business.
- Services should be designed to deliver a unified and efficient system rather than component-by-component which can lead to poor overall service performance.
- Services should be designed based on creating value for users and customers and to be as efficient as possible.
- Services should be designed on the understanding that special events (those that cause variation in general processes) will be treated as common events (and processes designed to accommodate them)
- Services should always be designed with input from the users of the service.
- Services can and should be prototyped before being developed in full.
- Services must be designed in conjunction with a clear business case and model.
- Services should be developed as a minimum viable service (MVS) and then deployed. They can then be iterated and improved to add additional value based on user/customer feedback.
- Services should be designed and delivered in collaboration with all relevant stakeholders .

BENEFITS OF SERVICE DESIGN

Service Design ensures that the service actually gets used by users in the intended way and creates positive experiences, thus minimizing the need for costly and lengthy customer services. Engaging in a service design process benefits an organization in several ways:

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1. Improves Sales: The application of the service design structure helps a business to understand the customers' needs, demands and expectations, and create solutions in accordance to them. Customers' positive interaction with the product or service means their retention and ultimately greater success and profitability for the business.

2. creates Loyalty: The ultimate challenge for businesses in today's competition driven era is not just attracting new clients but also retaining them in the long run. With availability of a wide range of service options, customers can switch services and brands very easily and thus are spoilt for choice. So enterprises have to look for ways to make their service or product distinct from their competition. Service design allows businesses to understand what customers are looking for and expecting from a service. They can then make their offerings adaptable and better suited to those needs. This vintage point can help them stand apart from their competition and retain their customers' loyalty.

Strengthen the Brand and Identity:

The service design approach allows enterprises to strengthen their brand. The service design process helps service managers to progress from the known to the unknown. It consists of the basic and yet critical evaluation of how the new envisaged product or service fits into the overall image and objectives of the company.

Thus, the process helps an organization to stay true to its image and reaffirm its brand and stop it from steering away from its core values and objectives while offering a new service. Service design puts a brand to work, unlock its hidden potentials, and create and deliver value to the customers.

Reduce Redundancies:

Envisioning the whole cycle of the service design process allows companies to take a bird's eye view of their service and remove duplicative segments. It helps managers pinpoint where services might be converging or overlapping and it can help them straighten them out before hand.

This way inconsistencies and ambiguities can be discovered within the process on and can be rectified. The process of elimination of redundancies conserves energy, improves staff's efficiency and reduces costs.

Improve Efficiency:

Creative and imaginative steps involved in the service design process help firms improving the efficiency of their employees and procedures. It helps in elimination of wastage and allows team members to pinpoint areas where there is a resource drain or a bottleneck.

Service design blueprints help businesses locate problematic areas and potential failure points and rectify them before hand. Engaging teams in the service design procedure allows them to envision the bigger picture and situate their role in it.

It helps them understand why change and innovation is necessary in what they are offering and how they are offering it

SERVICE BLUEPRINT

What is service blue print?

A service blueprint is an operational planning tool that provides guidance on how a service will be provided, specifying the physical evidence, staff actions, and support systems infrastructure needed to deliver the service across its different channels.

For example, to plan how you will loan devices to users, a service blueprint would help determine how this would happen at a service desk, what kinds of maintenance and support

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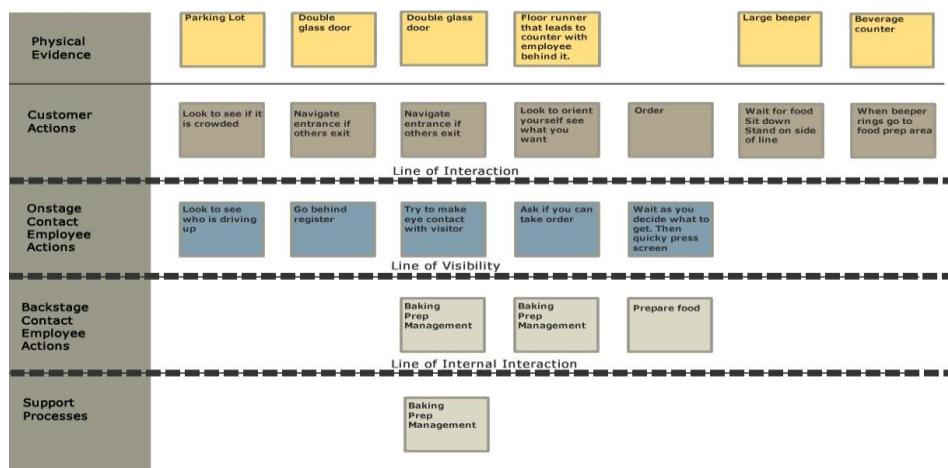
activities were needed behind the scenes, how users would learn about what's available, how it would be checked in and out, and by what means users would be trained on how to use the device.

Service Blueprints may take different forms – some more graphic than others but should show the different means/channels through which services are delivered and show the physical evidence of the service, front line staff actions, behind the scene staff actions, and support systems.

They are completed using an iterative process – taking a first pass that considers findings from personas, journey maps, and location planning and then coming back to the blueprint to refine it over time.

Often blueprints raise questions that cannot be readily answered and so need to be prototyped; for instance by acting out an interaction or mocking up a product.

Service Blueprint | Panera Bread



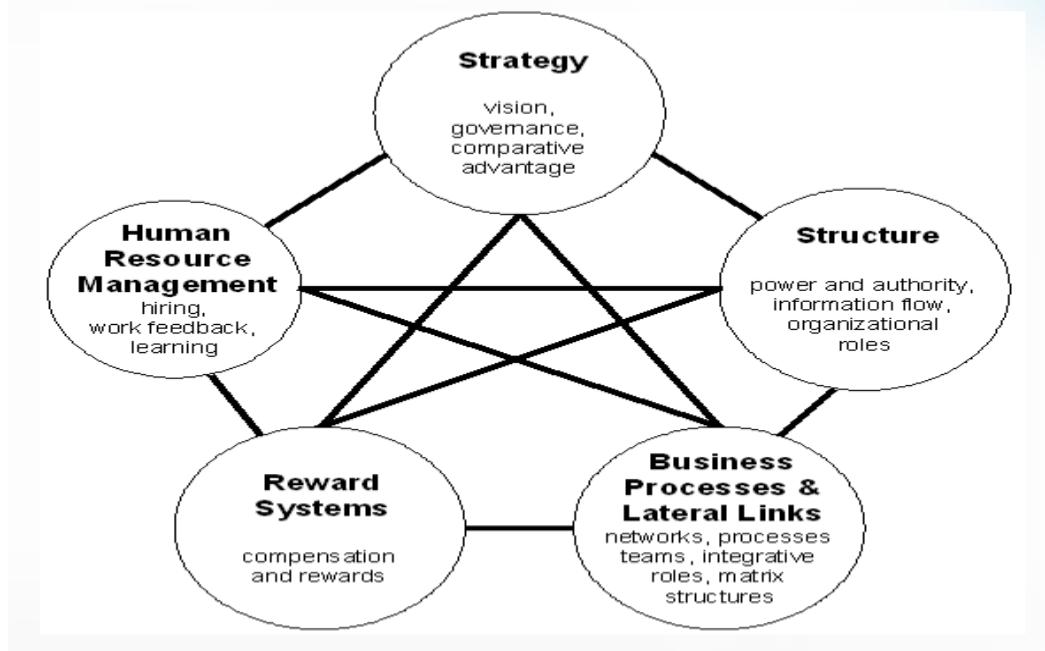
DESIGN STRATEGY

Design strategy is the term used to describe the nexus between corporate strategy and design thinking.

Corporate strategy is the traditional method that businesses and other similar entities use to identify, plan, and achieve their long term objectives and goals.

Design Thinking is a methodology that provides a solution-based approach to solving problems by engaging the end-users. As in war and business, we need a way to put a strategy into effect, and that requires a methodology, a framework, a roadmap, and a way of thinking.

In order to implement a design strategy, it requires a **strategic thinking mindset**.



PRINCIPLES FOR INFORMATION DESIGN

- Information flow is key to delivering high quality services; if people don't know what they're supposed to and when they're supposed to know it – service suffers. These are simple principles for information design in service design:
- Data shall be normalized between the organization and its customers and within the organization itself.
- Data shall be easy to transfer and be reusable within the organization and within the partner network.

