Design Thinking for Innovation

by

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Understanding the role of innovation in entrepreneurship

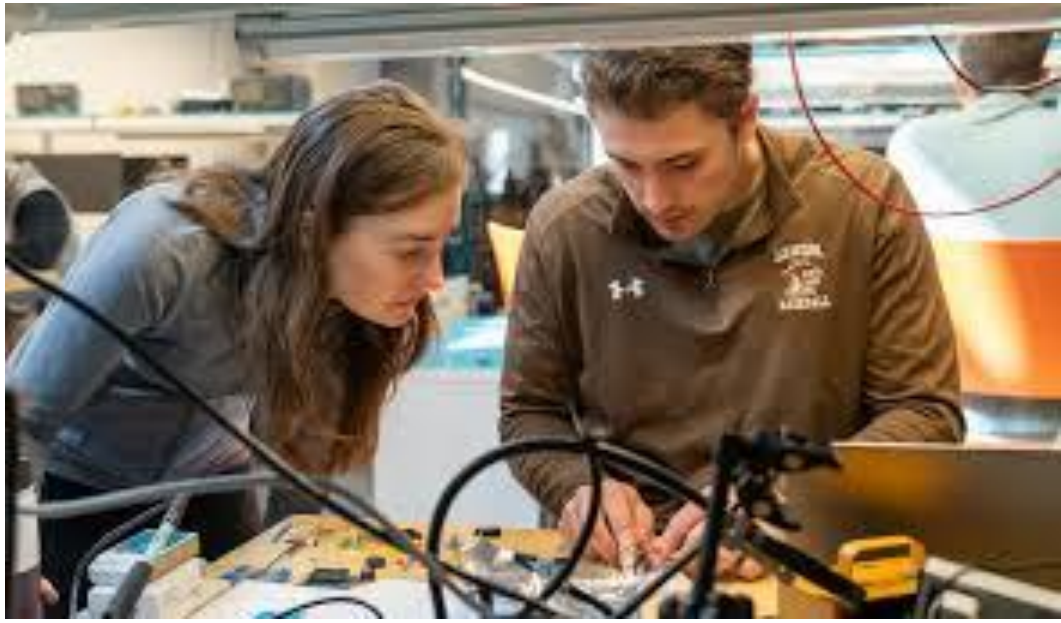
- pivotal for growth and to stay ahead of competitors,

these two are intrinsically intertwined in business development.

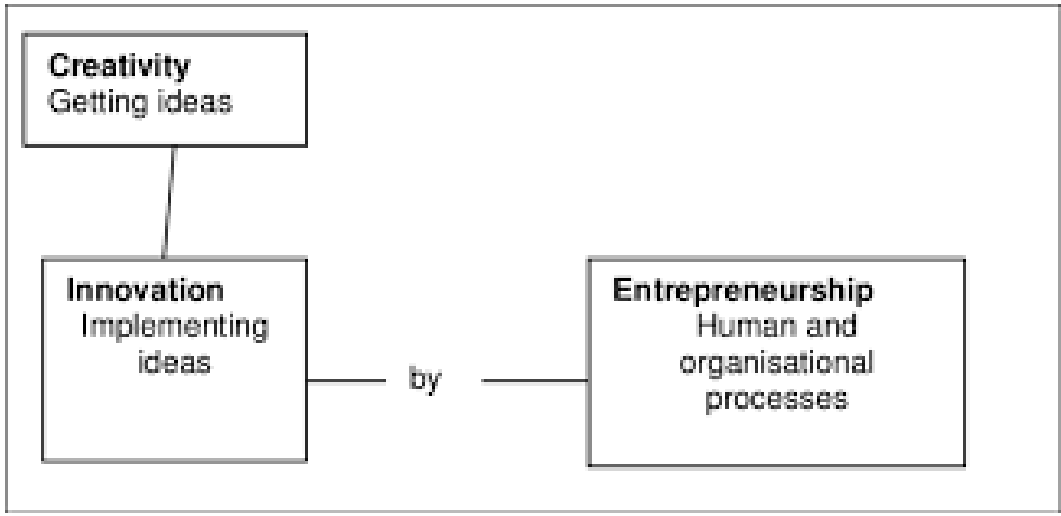
In this dynamic business environment, innovation is commonly regarded as the driving force behind successful entrepreneurship.

- **'Entrepreneurship'** contends with identifying opportunities, taking calculated risks, and creating a (business) venture and managing it to achieve a set of goals. 'Entrepreneurs' exhibit propensity to innovate and willingness to embrace change to build on these opportunities.

- **'Innovation'** is the act of envisaging new ideas, methods, products/ services that enhances the value for the business – it may be incremental improvements or disruptive breakthroughs that transform the industry.



Courtesy: Lehigh University



Courtesy: Researchgate

How ‘innovation’ plays in towards several aspects of entrepreneurship:

Opportunity Identification: Entrepreneurs demonstrate the ability to identify market gaps and opportunities. Innovation plays a crucial role by rendering fresh perspectives, challenging existing credo, and educing novel solutions to user needs /pain-points while recognizing these opportunities.

Value Creation: Successful entrepreneurship boils down to delivering value to customers. Innovating products, processes or services, by thinking differently and embracing change, are the ways-in through which entrepreneurs create this value

Effectively Compete: Competition is fierce in present time, which is why entrepreneurs always seek innovative means to differentiate from their competitors, in terms unique features, better customer experiences, or disruptive business models.

Risk Management: Entrepreneurship underlyingly involves risk, which can be mitigated through ‘Innovation’ by way of ‘data-driven insight’ based decision-making, rationalizing operations, and bearing a deep insight about market dynamics; and with informed decisions the uncertainties can be handled.

Adaptability: Entrepreneurs need to remain agile and adaptable under the dynamicity due to economic, technological, and social changes, where Innovation ‘antes up’ with the tools to pivot and make headway in the face of change.

Scaling-up and Growth: Innovation catalyses business growth and empowers entrepreneurs to diversify product/ service offerings, explore new markets for expanding customer base – such scalability of ventures results from commitment to innovation.

Investment: Investors look for innovation potential in entrepreneurial ventures - strong innovative edge is an important factor in securing funding from investors like, ‘Angels’, venture capitalists (VCs) or Crowdfunding platforms.

Need for consideration for **Design** (Thinking) – an enabler of Innovation

The process of 'Sales' starts with the way the product is designed.

- The two major questions needed to be asked are; what is the precise need of the customer, and who are the 'customers'

- There are new entrepreneurs, who are not clear about these questions and want to sell everything to everyone, and they sell to no one.
- One, therefore, has to look from the perspective of the customer and understand how important is the product/ service and what it accomplishes

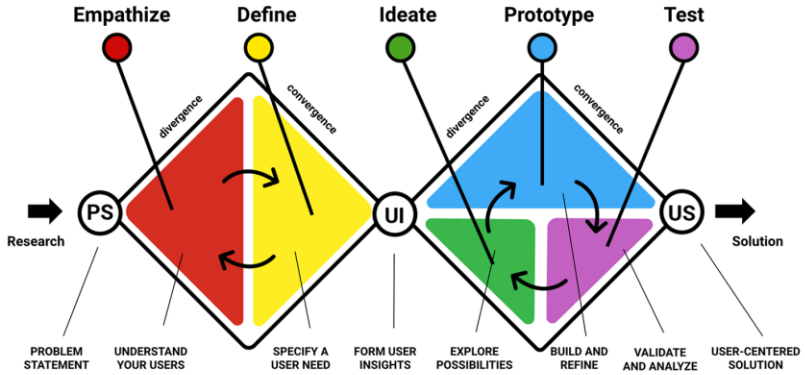
- So, it begins from that, the design of the product – because if the business is selling **something that people actually need, half of your sale is done.**

  - if the business sells something just for quick money it does not work.

That is, 'whom' the solution is undertaken for, and what is the 'problem' the business is solving are critical and everything is to be designed around that.

Market requires enterprises to be more and more competitive – a prime reason for the development of innovation strategies.

An approach adopted increasingly in innovation processes is **'Design Thinking',** which offers innovators and startups an efficacious model of a systemised creative process, helping them with a toolkit to accelerate and improve creative processes.



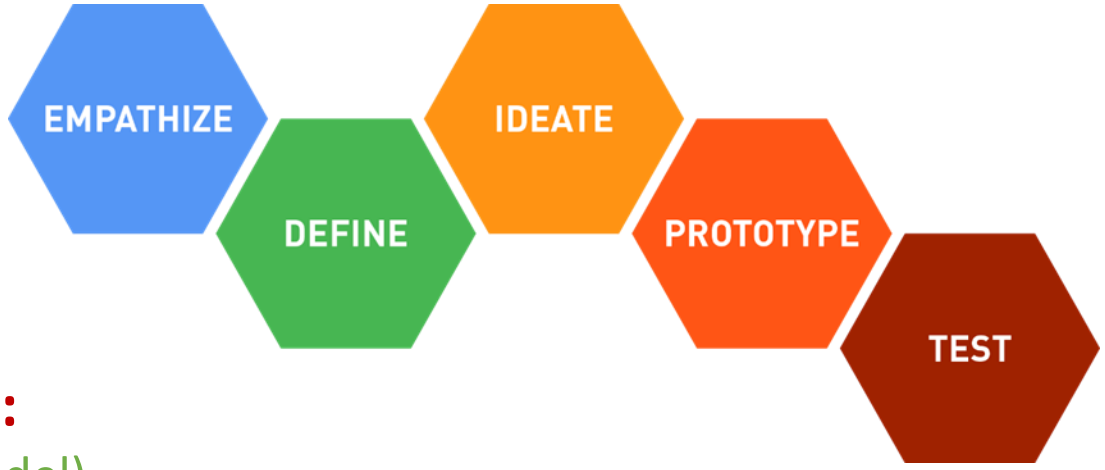
Design Thinking: Double Diamond Model
by Chris R Becker
on Dribbble

What is Design Thinking?

- Design Thinking (DT) is a discipline that uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity, according to Tim Brown of IDEO, and thinking like a designer can transform the way one develops products, services, processes, systems and even strategy.

- DT is a methodology that ingrains in the whole gamut of innovation activities a disposition of user-centered or broadly speaking, a human-centered design orientation.

- It is about designing products or services based on close observation of the user's need and expectations or disliking of about the product or the way a product is configured, packaged, marketed, sold, and supported.



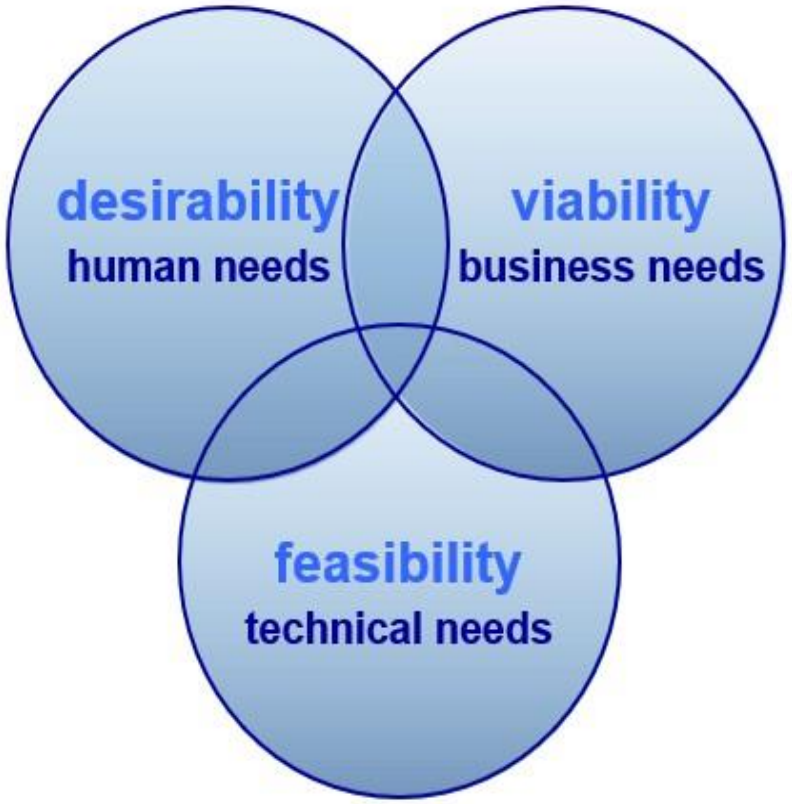
Design Thinking (DT) as a basis for Innovation:

(Elucidation with reference to Stanford d.school's DT Model)

- **Empathize:** Innovation approach is user-centered (human-centered), based on discovery and deep understanding of pain points (problem)/ gains desired.
- **Define:** Innovation would be targeted to solve a problem, based on insight developed.
- **Ideate:** Innovation based on generation , analysis and critical evaluation of ideas, considering the user desirability, technical feasibility and economic viability of the solution.
- **Prototype:** Innovation should be materialized in efficacious transformational terms.
- **Test:** Innovation ought to be verified with user and the solution to be refined.

Design Thinking Principles

- Does the solution engross empathy for end-users?
- Is this the solution simple enough for the intended purpose accomplished?
- Is it useful?
- Is it elegant?



- Is the solution affordable?
- Does it improve profitability?
- Are the proficiency and skills available?
- How much is the ROI?

- **Innovation is at the Intersection.**

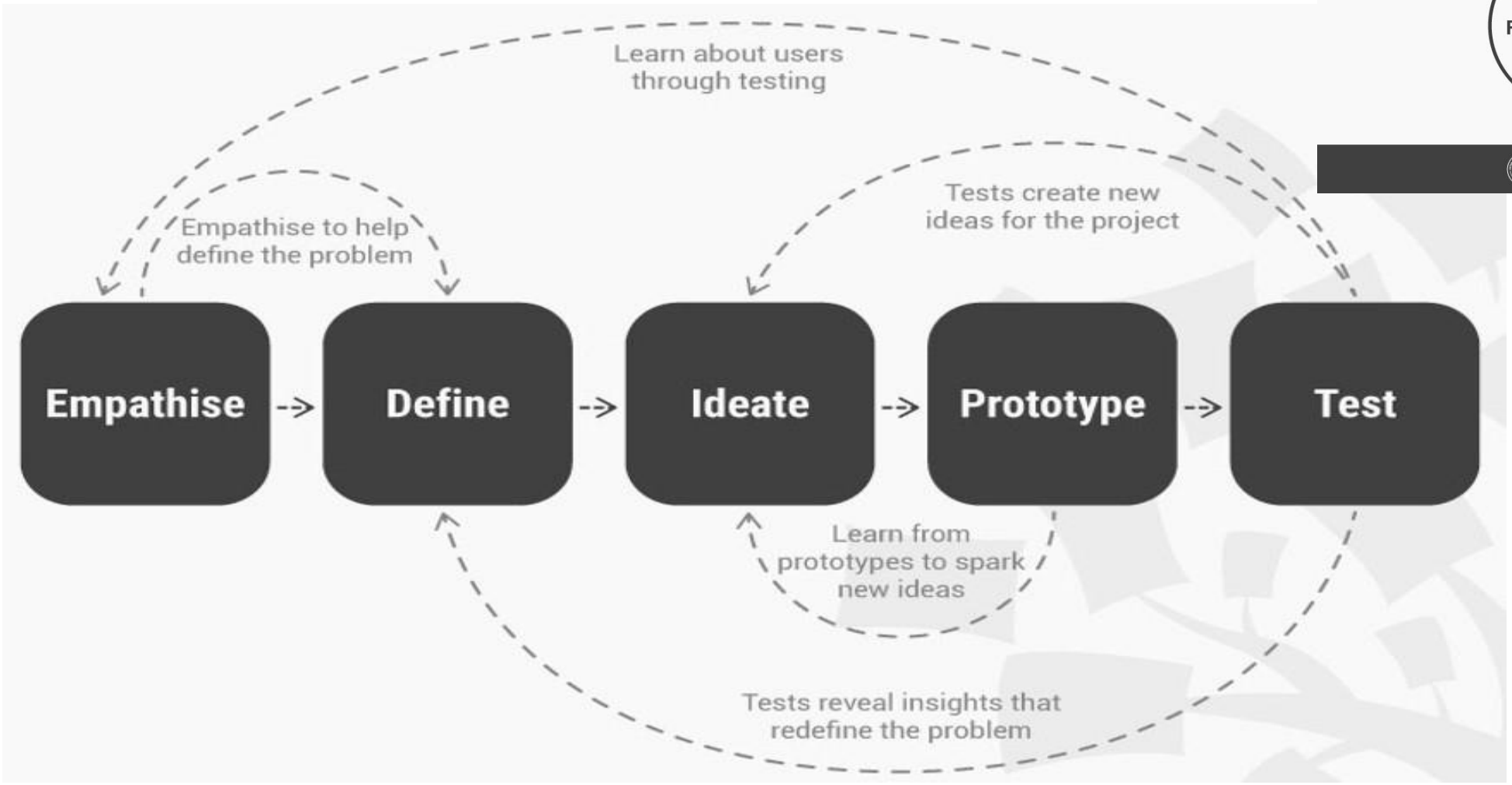
Product creation Phases:

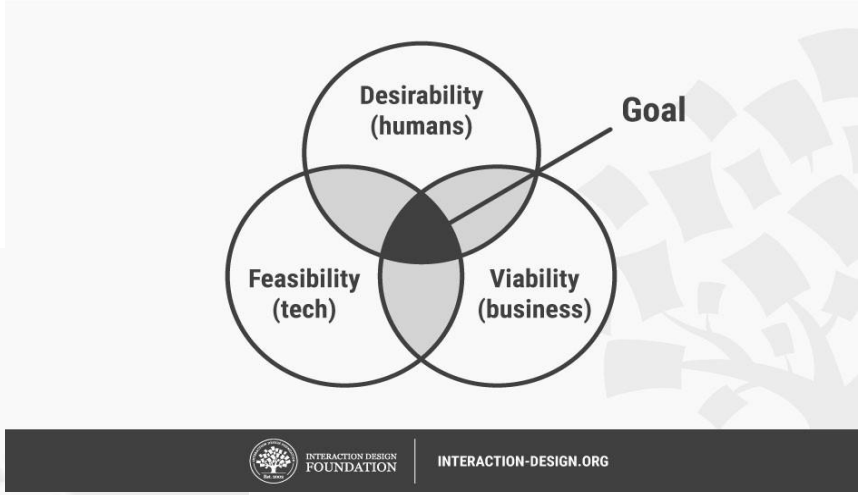
0) Understand/observe
1) Visualize/Realize
2) Evaluating/Refining
3) Implement (detailed engineering)
4) Implement (manufacturing and liaison in vendor operation)

- How quickly can the solution be configured to suit the needs?
- Is the solution maintainable without much hassle?
- Is it consistent with the existing system profile?
- Is the solution conveniently supportable?

Design Thinking: A Non-Linear Process

(Ref: Teo Yu Siang and Interaction Design Foundation, author of the diagram)





Courtsey: Paras Hospital

Courtesy: Straight Talk Counseling

Step 1: Empathize

- It is holding back ones opinions, mindset and beliefs, culture, learning and knowledge, purposefully in order to understand other peoples' (users/ customers) experiences of affairs and stuff deeply and meaningfully.

- It necessitates a high degree of ingenuity for imaginativeness to be able to see through another person's view point.

- It is absolutely necessary for absorbing and understanding the first-hand and raw information.

- It is not easy, since people generally are trained, due to grooming process in acquire knowledge and experience to form judgments and opinions rather than absorbing and understanding the raw information.

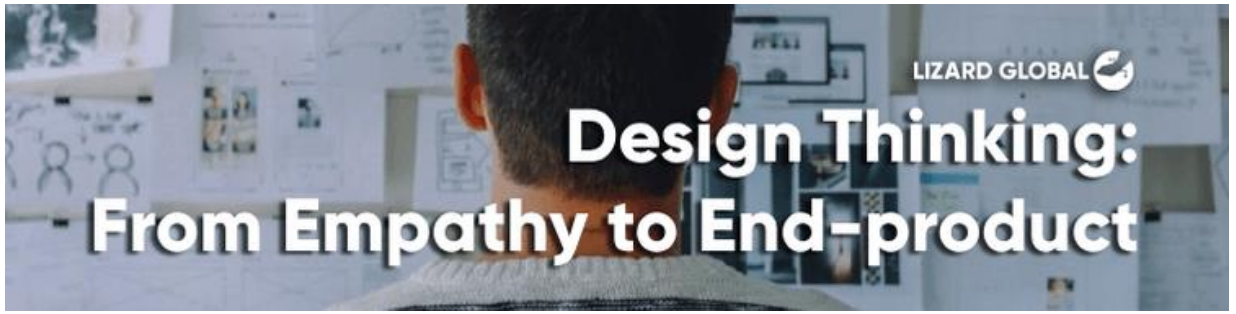
Empathizing – What it is: It is at the core (HCD)

Empathy is at the core of a human-cantered design (HCD) process and the undertaking in this mode is to understand users, within the context of a considered design challenge.

The effort here is to evolve an insight about the way people do things and why, their needs – both physical and emotional, their worldview, and what is meaningful to that particular group of people to create meaningful innovations.

Courtsey: Cornell Human Centered Design

Courtsey: Imperial College London



Courtsey: LIZARD.global

Empathize – why is it needed:

The best solutions can come from the best insights into human behaviour and 'Good Designs' are created on a sound insight about the beliefs and values held by people.

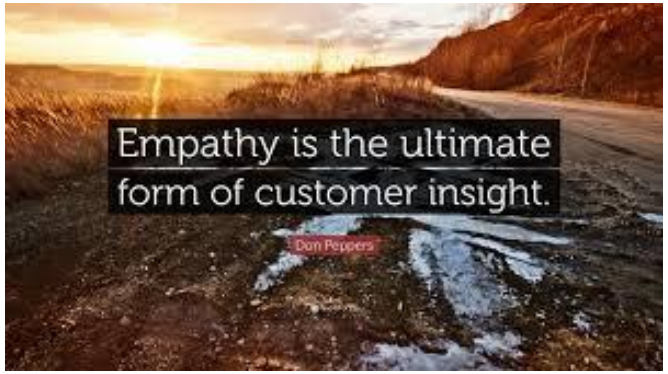
With observation and listening what a particular group of people do or say and how they interact with their environment (bodily manifestations of their experiences) helps one to develop perceptions about what they think and feel and it befits learning about what they need or want.

Observation and listening allows to decipher the meaning of those experiences so as to bare customer insights that guides in innovative solutions.

Empathising is actually about engaging with people and learning to see things with a fresh set of eyes to capture the way they think and the values they hold, as sometimes people say they do things in a way but actually they are found to be doing differently.

These thoughts and values of the users are not always quite clear even to themselves, and a good conversation can surprise both the designer and the user by the revelation of unanticipated customer insights.

Learning to pin point the customer insights, however, is harder than one possibly thinks as our minds unintendedly filter out a lot of information without our even realizing it.



Cortsey: QuoteFancy

Empathize – how to [Observe, Engage, Demonstration]

Courtesy: Banelec

- Observe - Watching/ Studying
- Engage - Interviewing and Listening
- Demonstration

Courtesy: YouTube

Courtesy: Coursera

Courtesy: Naval Sea Systems Command – Navy.mil

Observe (Watching/ Studying):

- To make observations in relevant contexts of the design challenge (in addition to interviewing) and often impactful insights may be gained by noticing a disconnect between what people say and what they do.
- At times ‘shortcuts’ created by people may be very striking to the designer, but the ‘subject’ may not even think of mentioning about it in conversation.

Courtesy: Navigos Search

Courtesy: Management Notes

Engage (Interviewing and Listening)

- To be effective, it should be more like a conversation even though the engagement process is generally known as ‘interviewing’.
- It is expected that conversation may strictly not follow the prepared questionnaire and it is advised that the interviewing is loosely bounded.
- Designer should elicit issues from the people during interview/ conversation and ask the ‘why’ questions to scrape up deeper meaning and therefore the process can be both short ‘intercept’ encounters and longer scheduled conversations.

Courtesy: Forage

Courtesy:
Student Life Blogs – University of Toronto

Demonstration:

- The designer should combine observation and engagement, however, it may furthermore be necessary to ask the subjects to show how they complete a task.
- It may be relevant that they physically go through the steps, and explain why they are doing what they do and also verbalise what's going through their minds as they perform a task or interact with an object.
- Conversations regarding context and background relating to home or workplace, whichever is related to design challenge, since deeper questions would help to know about users for whom 'creating meaningful innovations' is aimed ultimately.

Courtesy: Department of Energy

Courtesy: Gardens Libraries and Museums – University of Oxford

Progression: from ‘Empathize’ to ‘Define’

Courtsey: Smith School of Business – Queens University

As designers proceeds from empathy work to drawing conclusions out of it, they need to process all the things they observed and listened, that is unboxing information, so as to comprehend the broad picture and capture the sum and substance of it all.

This ‘unboxing’ is a way to begin that process, that is by sharing the findings with the design team and capturing the important parts to visualise, may be on a board (on the wall).

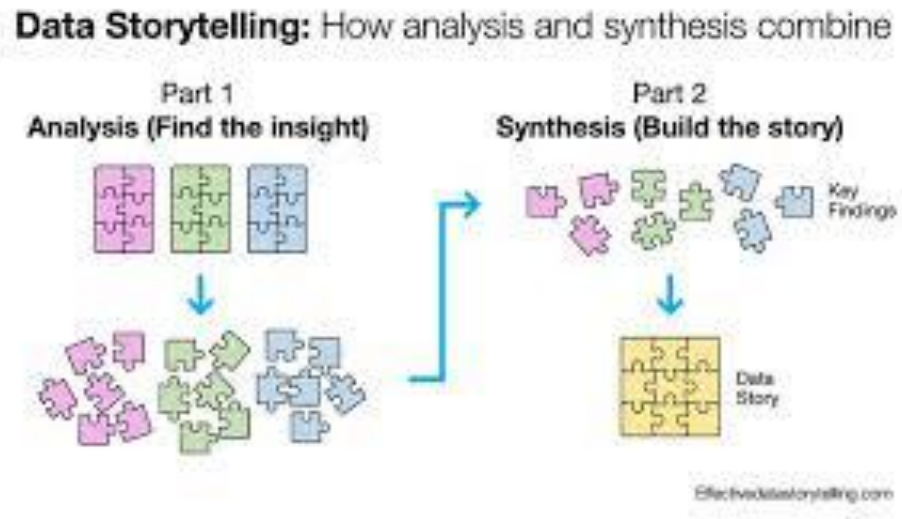
It is getting the information out of the designer’s head on to the wall/ board where they can start to relate and make connections – ‘post-its’ with notes/ comments, user journey maps or experience, and whatever that captures impressions and information about the user.

This is the beginning of the synthesis process, which transitions into a ‘Define’ drill.

Courtesy: iStock

Step 2: Define

What is ‘Defining’?



Brent Dykes on LinkedIn

Courtsey: iStock

- **Assimilation** of information gathered in the ‘empathy phase’ followed by **analyzing** and **synthesizing** the observation.

  Analysis (analyzing): Breaking down complex concepts and problems into smaller and simpler elements for better understanding and comprehension.

  Synthesis (synthesizing): Creatively putting together research output and analysis data to construct whole ideas. The steps followed respectively are organizing, interpreting and making sense of the data gathered to create a problem statement.

- Leading to creating meaningful and accurate problem statement based on developed insight

Courtsey: Freepik

DEFINE: ‘Define’ mode – what it is?

Framing the ‘right problem’ (that emerges through a process of synthesizing information**)**
is the precise way to create the ‘right solution’.

‘Define’ in design process is to bring clarity and focus to the design space.

It is the design thinker’s responsibility and vantage to define the challenge/ problem that s/he is taking on based on the insight from the ‘empathise’ phase regarding the user and the context.

The intent of the Define mode is to frame a meaningful and actionable problem statement, in line with ‘point-of-view (PoV)’, a guiding statement that dwells on insights about the needs of an user (or composite user persona).

Insights usually do not just unexpectedly comes to the design thinker; they actually emerge through a process of synthesizing information to track down connections and patterns, leading to sensemaking as the outcome in Define mode.

Point of view (PoV) is shared by the users in the ‘Empathize’ phase of design thinking.

This PoV is turned into a ‘problem statement’ in the ‘Define’ stage, which is a written expression of the user's problem.

An effective problem statement is actionable - means a problem that can be acted upon.

‘Define’ – Why to?

Define mode is critical for PoV/ Problem Statement

The Define mode is critical as it evolves the ‘point-of-view’ (PoV) into a clear-cut Statement of the problem the designer is striving to address.

More essentially, the PoV defines the ‘right’ challenge to address, based on the findings about the user and the problem space.

The Define mode, moreover, is also a bid to synthesize the scattered findings into powerful insights.

It is this ‘synthesis’ of the empathy work that bestows designer the vantage that s/he only has: discoveries, that is, the ‘Insight’ that design thinker can leverage to tackle the design challenge.

Courtsey: Medium

Define – How?

A deep dive is taken if something interesting is noticed and then it is to be figured out why that might be.

Through asking why someone had a certain behaviour or feeling, the designer in effect is making connections from that person to the larger context.

It is needed to develop an understanding of the type of '**user**'; the persona.

It is required to synthesize and select a moderate set of **'needs (problems)'** considered by the designer as important to fulfil, which however, may be a singular choice of an important need as well.

It is vital to work to put across **'insights'** the designer developed through the synthesis of information s/he has gathered through empathy and research work.

It is then required to express a Problem Statement by assimilating these three elements – **user, need (problem),** and **insight** that is to become an actionable problem statement to drive the rest of the design work.

Design thinker considers what revealed during the empathy excercises, that is observing and interviewing (conversing with) people to reckon what patterns emerge by looking at the information set.

Point-of-View (PoV): The problem statement should be precise

An exemplary 'point-of-view'(PoV) is one that:

- provides focus and frames the problem

- inspires the team

- informs criteria for evaluating competing ideas

- empowers the team to make decisions independently in parallel

- captures the hearts and minds of people the designer interacts with

- saves the designer from an impossible task of developing concepts that are all things to all people (since, ideally the problem statement should be discrete, not broad)

- **Framing the problem right is an imperative to create the right solution**
- **Crafting a more sharply (narrowly) focused problem statement tends to yield both greater quantity and higher quality solutions during the idea generation process.**

Point of view (PoV) is shared by the users in the 'Empathize' phase of design thinking.

This PoV is turned into a problem statement in the 'Define' stage, which is a written expression of the user's problem.

An effective problem statement is actionable, which means a problem one can act on.

Progression: ‘Define’ to ‘Ideate’

In ‘Define mode’ the designer determines the specific meaningful challenge to take on, and in ‘Ideate mode’ the focus lies on generating solutions to address that challenge.

A well-scoped point-of-view (PoV) and well-articulated ‘Problem Statement’ will lead the designer into ideation as a very natural course of action.

The PoV is a useful guide to monitor if brainstorming topics tends to depart from the PoV reference.

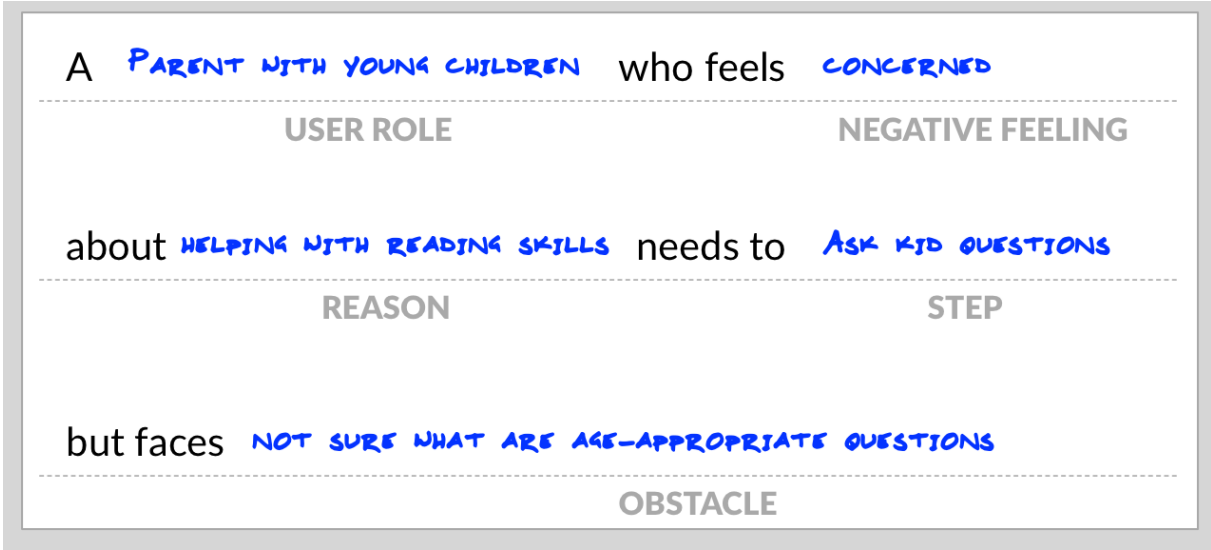
From the Problem Statement flows the next step that is to create a list of ‘How-Might-We’ (HMW) questions, and brainstorming ‘topics’.

- these brainstorming ‘topics’ are subsets of the whole problem, focused on different aspects of the challenge.

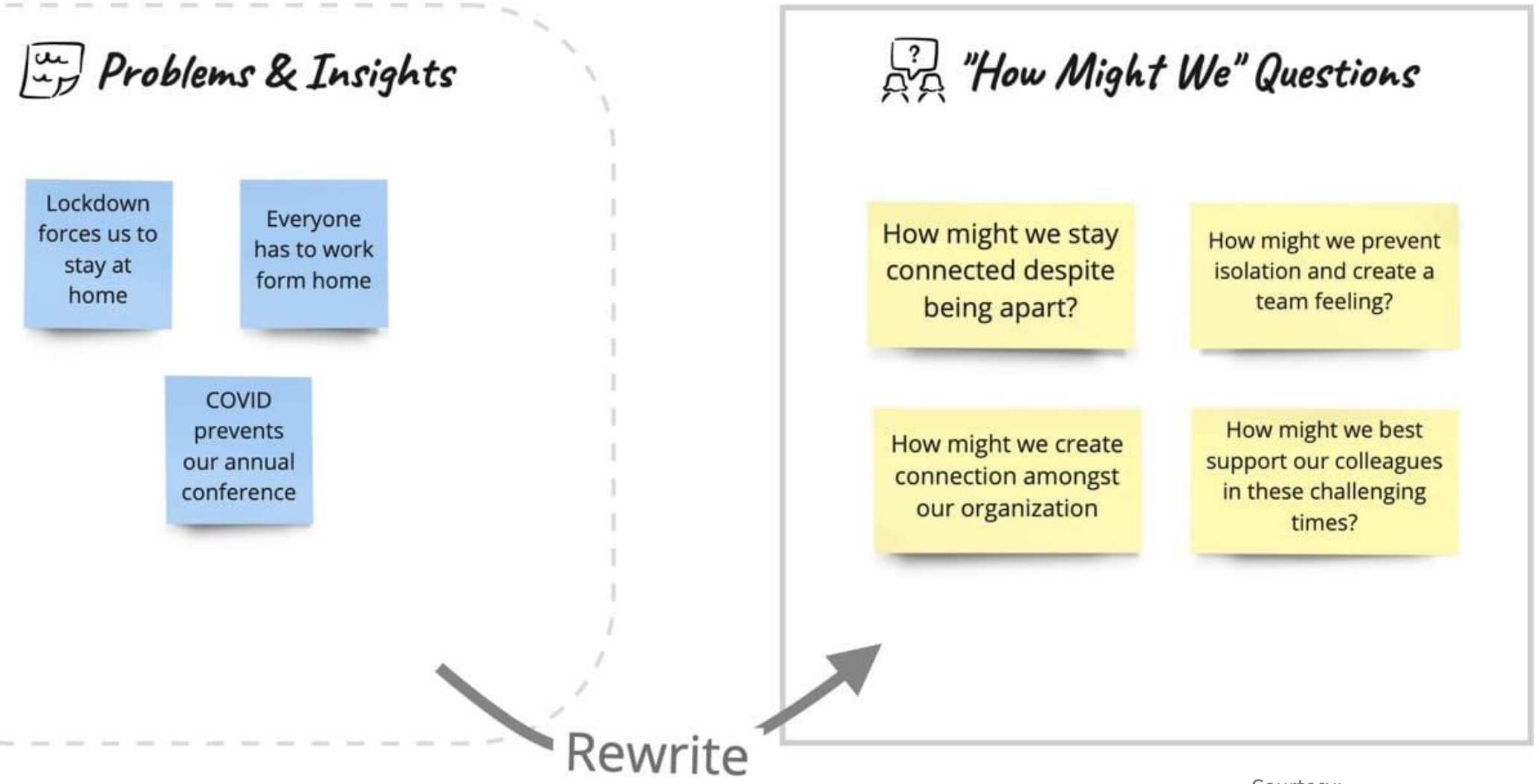
Defining is articulation of meaningful challenge

- from ‘defining‘ as the designer moves into ‘ideation’ can and will select different topics

- where the group can really churn out a sizable number of compelling ideas and try out a few to find the very good one (sweet spot).



Courtesy: Medium



Courtesy:
Facilitator School

POV - PS - HMW

This stage is to indicate the problems users want the innovators to solve with their design. To compose the problem statement (PS) the designer uses the Point of View (POV) structure, which helps to script all the design problems correctly, which in turn to be written as 'How-might-we (HMW)' questions so that brainstorming solutions (or other ideation techniques) at the Ideation stage.

Insights	Needs	POV	HMW
Users often look for ways to assess their performance in learning a foreign language themselves, since teachers do not always pay attention to this, and sometimes even skip such conversations, and this greatly affects their motivation	Users should be able to receive reports on the work in a foreign language lesson, as well as on success over a certain period of time.	Nina needs to be able to receive feedback on her work in a foreign language class, as well as a progress report for a certain period because she often looks for ways to evaluate herself since teachers do not always give her feedback on her progress.	How might we help Nina get feedback on her class and progress over some time?

Courtrsy: OTAKOI - An example of a point of view (POV) and how might we (HMW) for an online e-learning platform

Defining and HMW Statement:

The **Problem Statement**, commonly known as **'How-Might-We (HMW)'** statements (question) are utilised to transform challenges into opportunities for creative problem-solving and innovation.

Defining is articulation of meaningful challenge

- from 'defining' as the designer moves into 'ideation' can and will select different topics

- where the group can really churn out a sizable number of compelling ideas and try out a few to find the very good one (sweet spot).

Courtesy:
Jalan Journey

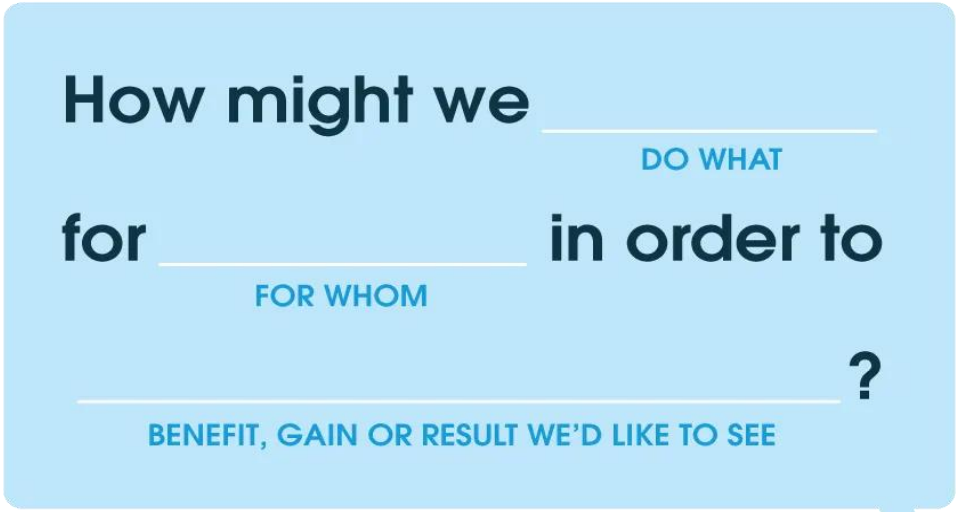
The HMW Statement, is the one that translates (i) a challenge, (ii) a user need, or (iii) a compelling user-insight that was gathered along the problem exploration activity during 'empathizing' stage into an opportunity for 'design' by rescripting it as a 'question' and educing to come up with ingenious ways on approaching this challenge.

HMW Formula

HMW, expressed as a 'formula' would be something as follows in the ideation session:

"How might we" + Intended Action (as an action verb) + "for" + Potential User (as the archetype/ subject) + "so that" + Desired Outcome.

For example - **How might we redesign products (intended action) for customers (potential users) so that they do not generate plastic waste (desired outcome).**



Courtesy: Trailhead - Salesforce

Too broad	*How Might We make our website better?*
Too narrow	*How Might We make our website better by making visuals more entertaining?*
Just right	*How Might We make our website more appealing to customer segment X?*

Courtsey: Viima

How-Might-We (HMW) statements (question) are utilised to transform challenges into opportunities for creative problem-solving and innovation.

Coursey: www.amitbansal.in

Courtsey: Kitameraki

Step 3: Ideate

- This stage is aimed to elicit the best of ideas for solving a defined problem, through ***Brainstorming*** and even the wildest idea generation activities.
- *Creativity* and *Innovation* are the fountainheads and impetus behind developing solutions.
- Generation of ideas in good numbers or quantity is the aim, which on screening yields workable concepts, based on the filters of desirability, feasibility and viability.

IDEATE

‘Ideate’ mode – What this is?

In Ideate mode of the design process the designer focus on idea generation.

It represents a mental process of ‘going wide’ in terms of concepts and outcomes.

Ideation is more about generating the broadest range of possibilities than just coming up with the ‘right’ idea hurriedly.

Ideation provides both the fuel and also the source material for getting innovative solutions and building prototypes.

Courtsey: Intrapreneur Nation

‘Ideate’ –why to? - **to make a transition from problem identification to creating solutions for the users**

Ideation is the designer’s scope to combine the understanding s/he has of the problem space and user with the designer’s imagination to generate solution concepts.

Ideation is primarily about pushing for a widest possible range of ideas from which the designer can select, not just simply finding one best solution, particularly early in an ideation session in a design project.

Ideation are leveraged to:-

- Go beyond obvious solutions and thus increase the innovation potential of the solution set
- Harness the collective perspectives and strengths of the group.
- Make out unexpected areas of exploration
- Create fluency (volume) and flexibility (variety) in the innovation options
- Get obvious solutions out of head, and drive the team beyond those

Courtesy: Mindspower

The notion is that the determination of the best solution will be discovered later, based on feasibility criteria and through user testing and feedback.

‘Ideate’ – How to? **One ideates by linking conscious and unconscious mind, and engaging in rational thoughts with imagination. And, by building.**

- **An ideation exercise, such as in a brainstorm session, the team leverages the synergy of the group to arrive at new ideas by building on others’ ideas** - Admitting constraints, being immersed in with inspiring concerned materials, and while embracing misunderstanding as well as disagreements, nevertheless, allow the designer to reach better solution ideas than one could just by simply thinking about a problem.

- **The other ideation technique is building – that is, prototyping itself can also be a way of aiding ideation** - One encounters issues or points where decisions need to be made when something physically is being created; this furthers new ideas to come up.

- **There are other ideation techniques:** such as ‘**bodystorming**’ (where participants physically act out situations they are trying to innovate within), **mindmapping**, and **sketching, Reverse brainstorming / headstand, Brainwriting, Six Thinking Hats, Crazy 8, SCAMPER, Broadcast search, Crowdsourcing, Pyramid search, Ideation campaigns**

separating ‘idea generation’ from ‘idea evaluation’

Whatever be the technique used to ‘ideate’, deferring judgment is the common theme for all

– that is, separating the ‘generation of ideas’ from the ‘evaluation of ideas’.

Courtesy: Linkedin

Courtesy: Remember Everything

Possible criteria for evaluating Ideas:

How fast can it be done?
How beneficial or effective will the idea be?
How easy is it to do?
How cheap or economic is it?
How risky is it?
How the design team feel about the idea?

Idea Generation Techniques

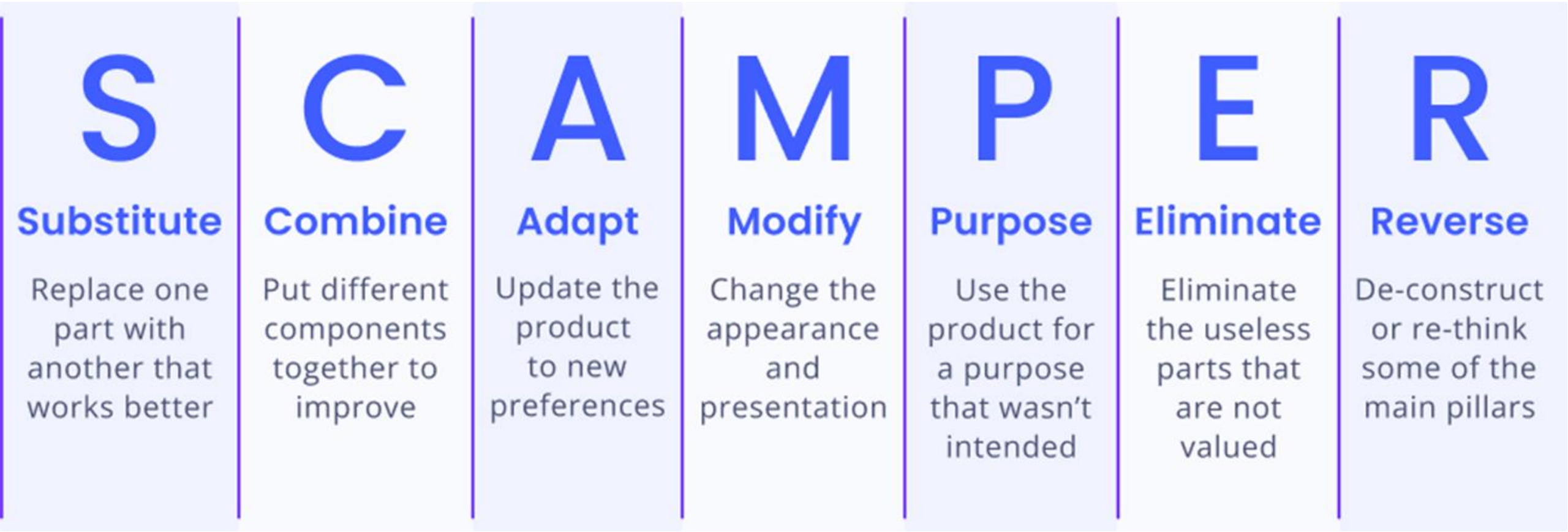
Courtesy: YouTube

- Reverse Brainstorming
- Brainwriting
- Brain Netting
- Forced Relationships
- Role-storming
- Storyboarding
- Five Whys
- Six thinking hats
- Gap filling
- Word Banking
- Wishing
- Rapid ideation
- Group Sketching
- S.C.A.M.P.E.R.
- S.W.O.T. analysis
- Trigger Storming
- "What if"
- Zero draft

Management Mantra

Because of separating the ‘idea generation’ from the ‘idea evaluation’, one’s imagination and creativity gets a voice, while placating one’s rational side for a period in knowing that s/he will get to the scrutiny of their merits later.

SCAMPER: An Ideation for Innovation method



Progression: ‘Ideate’ to ‘Prototype’

The objective is to take the best ideas forward into prototyping.

The solution alternatives, now generated through ideation, has to undergo a process of judicious selection, by which one can bring select ideas forward into prototyping, thus maintaining the innovation potential.

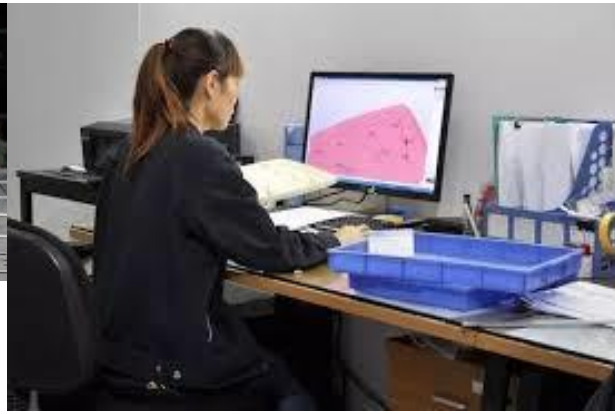
The team may choose, say for instance, voting criteria for different ideas as ‘the most likely to delight’, ‘the rational choice’, ‘the most unexpected’ as potential criteria generated during brainstorming, however, such criteria is actually to be decided by the team.

The objective is to take the best two or three ideas that receive the most votes forward into prototyping.

Finally, the aim could possibly be to take the best one forward. This process is radically different from the one where the team settles on a single idea based on just majority voting.

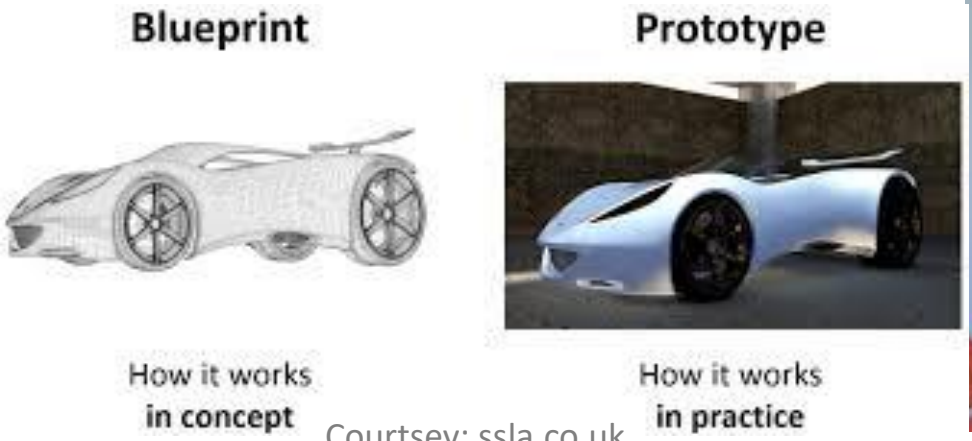
Courtesy: AutoDesk

Courtesy: WayKen



Courtesy: The Hans India

Step 4: Prototype



Courtesy: ssla.co.uk

Courtesy: AII3DP

What is a prototype?

- An early, inexpensive, and scaled-down version of a product that can be used to obtain the test results.

- It offers product creators the opportunity to bring their ideas to reality, test the practicability of the present design, and conceivably and reasonably investigate as to how the users perceive about a product.

Types of Prototyping:

- **Low-Fidelity Prototyping*:*** It is generally not a very complete version and rather often uses only a few features of the final intended design.

- **High-Fidelity Prototyping*:*** This version more or less resembles and operate as the finished product or closer to it.

PROTOTYPE

‘Prototype mode’ – What it is? [may be Digital and then Physical]

The PM is the iterative development of artifacts intended to answer questions that get the designer closer to the final solution.

Such questions may be broad in the early stages of a project and the designer would create low-resolution prototypes that are quick and cheap to make but good enough to elicit useful feedback.

Both the ‘prototype’ and ‘questions’ get somewhat more refined in subsequent phases and iterations.

A prototype can be anything that a user can interact with – be it a board of ‘post-it notes’, an artifact or gadget that has been put together, a storyboard, or even a role-playing activity.

Developing items for feedback from users/ stakeholders helps to arrive at the final solution.

Designers’ preference typically is for something that a user can experience with.

Walking a user through a scenario with a storyboard is workable.

Having the ‘user’ role-play through a physical environment, created by the designer, may rouse more emotions and responses from that person.

‘Prototype’ – Why is it necessary?

‘Building’ nourishes thinking and testing enhances learning

Courtesy: Getty Images

The purpose of prototype is to

- **ideate and problem-solve:** in a way it is ‘build to think’
- **communicate:** It is said that a picture is worth a thousand words and in that sense a prototype is worth a thousand pictures so to say.
- **start a conversation with users:** which are often richer when cantered around a conversation piece – a prototype, and facilitates a directed conversation with a user.
- **fail quickly and cheaply:** Committing as minimum resources as possible to each idea means less time and money invested up front.
- **test possibilities:** Staying low-resolution (in prototyping) allows the designer to pursue many different ideas without committing to a direction too early on.
- **manage the solution-building process:** Identifying a variable also encourages to break a large problem down into smaller, testable chunks.

‘Prototype’ – How to?

It is helpful to start building, even if, one is not too sure what exactly is coming up out of it.

The act of picking up some materials (paper-board, tape, post-its, or some suitable objects) can be fair to start a very low fidelity prototype.

It is advisable to not to spend too long on one prototype and simply becoming emotionally attached to any one prototype.

It is required to identify a variable that’s to be tested with each prototype – as a prototype is purposed to answer a particular question when tested.

However, one should be alert that other incidental understandings can also be gained from someone’s responds to a prototype.

The prototype is to be built with the user in mind and taking to what is hoped to be tested with the user - what sorts of behaviour is expected.

Answering these questions helps to focus the prototyping and to receive meaningful feedback in the testing phase.

Courtesy: The Altitude Agency Ltd.

Courtesy: Proto io Blog

Progression: From ‘Prototype’ to ‘Test’

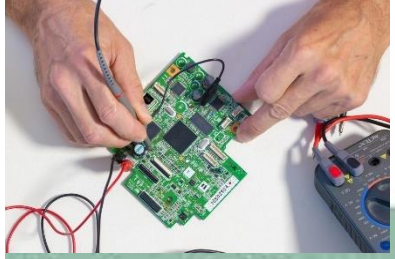
(One can learn a lot from a very simple prototype)

Instead of sequential progression from Prototype to Test modes, these two are considered in tandem.

Both, **what aspect is being tried to be tested** and **how it is to be tested** are crucial considerations before creating a prototype.

Sometimes both the above aspects are entirely intertwined, and in such cases too it is to be kept in mind that planning and executing a successful testing plan is a critical step after creating a prototype.

It is not just an affair of putting a prototype before the user for testing; rather the truly informative results can be gained through careful thinking about how to test so that it will facilitate the most natural and honest user feedback.



Courtesy: AutoDesk

Courtesy: Care@pcbmust.com

Courtesy: Razor

Courtesy: Entrision

Courtsey: Kitameraki

Step 5: Test

What is Testing?

- Testing in design thinking refers to and purposed for obtaining feedback from the users about the developed prototype, involving features and functionalities.

- This feedback helps the developer to understand the users more accurately.

Courtsey: ePravesh

Why Testing?

- Collecting feedback is crucial in design thinking and product innovation, and without proper understanding of the users needs the right set iteration in product engineering and development will not take place and the process will fail.

- If the users encounter any problem with the present solution version then the Product engineering team must rethink and design some alternative versions.

TEST

'Test mode' – what it is?: Testing bestows opportunity to learn about the planned solution and the user

Test mode is for feedback from users about prototypes and it presents one further opportunity to gain empathy when problem-framing and test-prototypes created are more 'concrete, unlike as was in initial empathy mode.

Notably, there should be no reduction of 'testing' work of finding whether or not users like the solution while continuing to ask "Why?"

It is to focus on what can be learned about the user, the problem, and the potential solutions, ideally within the real context of the user's life.

If it is a 'physical product', then the user may be allowed to use it within their normal routines and if it is something to 'experience' then an attempt may be made to create a scenario in a location that would capture the real situation.

If in situ testing of a prototype is not possible, a more realistic situation may be framed by having users take on a role or task to assess the prototype.

Courtesy: Appcues

An axiom:

Prototyping is to be done as though it is being right, but testing for if it is wrong.

'Testing' presents an opportunity to refine the solutions and improve them.

TEST – Why to?

To refine prototypes and the solutions as the test results dictates the next iterations of prototypes – which may mean going back to the drawing board as well as to learn more about the life of the user.

Testing often yields unexpected insights. Or, to refine the POV, and it can reveal that not only one did not get the solution right, but also that s/he failed to frame the problem correctly.

Courtesy: Appcues

Courtesy: Linkedin

Test – How to?

The proviso is to show and also put the prototype in the user's hands, or for non-physical ones put the user within an experience, but not to explain it all (yet).

This allows the tester interpret the prototype.

It is worth watching how they use it or even tamper with what is given to them while trying to handle and interact with it **[Observe]**

- then to listen to what they talk about it, and the queries they have **[Listen].**

Courtesy: Shutterstock

Courtesy: Esri

Courtesy:
Canadian Auto Dealer

The idea is to 'Create Experiences' – to create and test the prototypes someway that comes off as an experience that the user is weighing up, as opposed to an explanation that the user is evaluating.

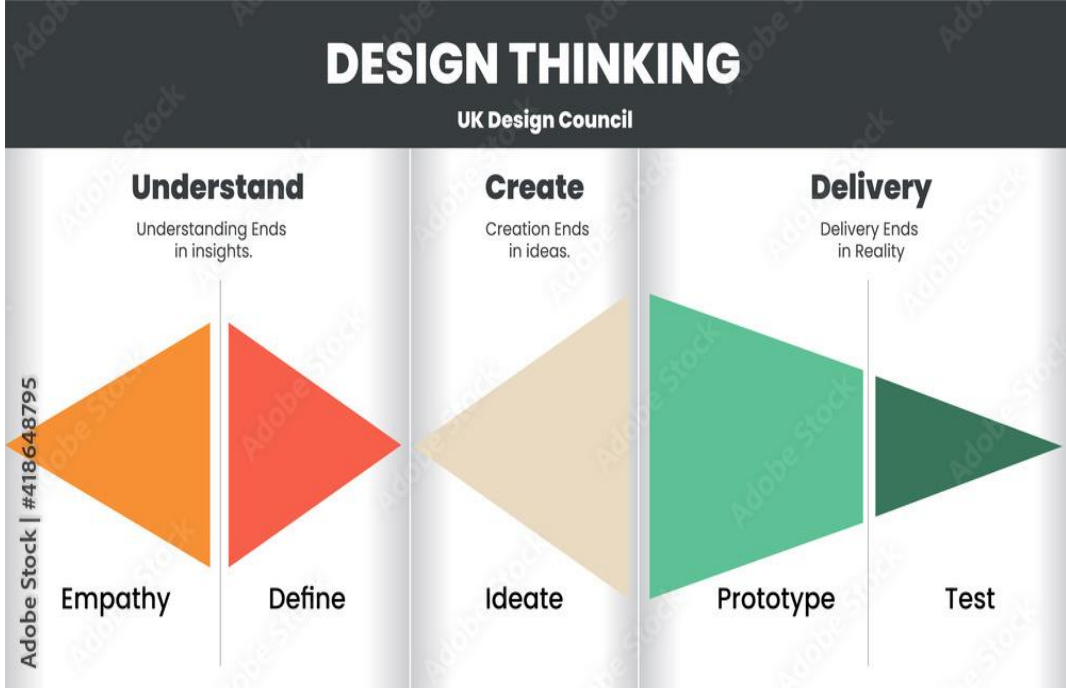
The user may be asked to compare and it requires to bring multiple prototypes to test that provides users a basis for comparison, and such comparisons, more often than not reveal implicit or unstated needs.

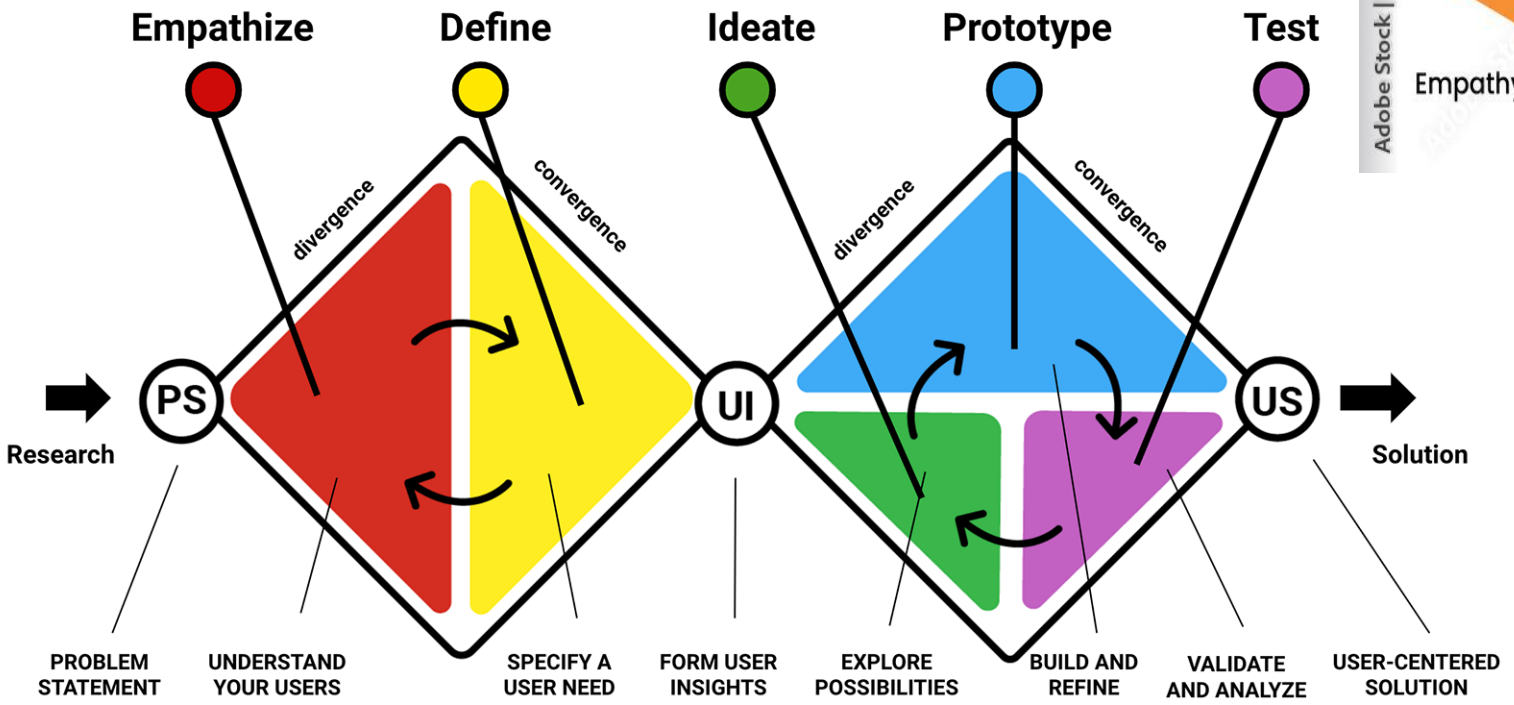
Takeaways

- This addresses a **functional definition** of ‘design thinking’ **for primary understanding** about it.
- Delineates the **inadequacy in practicing ‘Innovation’ in industry**, to help in **gauge the scope and opportunity for the industry**, covering corporate organisations and startups, to explore and embrace **as well as for the professionals** in this domain.
- The discussion covers **principles of design thinking** alongside the **innovation aspects** which is a common element in engineering practices be it a large corporate or a technology startup.
- Consequently, the aspect of **design thinking as a basis for Innovation** has been explicated, and
- Briefly introducing the steps in **design thinking process steps**.

Courtsey: Tennessee Arts Commission

DT: Double Diamond Model





Design Thinking:
Double Diamond Model
by Chris R Becker
on Dribbble