# Why Design Thinking Helps Identify Great Artificial Intelligence Use Cases

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## Introduction

Artificial Intelligence is a class of computer systems capable to performing tasks normally requiring human intelligence, such as visual processing, speech recognition & decision-making. It is a technology very much at its peak in the hype cycle. The advancement in this technology has enabled automation in multiple domains and in increasing depth over the last few years. Today, enterprises are aiming to automate almost anything, from simple monotonous, repetitive work to highly cognitive decision making processes.

Design thinking, on the other hand, is a human centric approach to solve problems. It brings structure to a problem solving thought process. The process runs through 5 main phases - Empathize, Define, Ideate, Prototype and Test. Each phase focuses on a particular aspect of the solutioning and the process can be iterative.



This paper aims to highlight how the design thinking framework compliments and encourages a mindset that helps in the Artificial Intelligence implementation process.

## Design Thinking Process - The Artificial Intelligence Perspective

Design thinking has a set of concepts that inherently brings human centricity to problem solving. It follows from this human centric nature that it is open to uncertainty. This openness is vital to solutions built on rapidly evolving technologies like Artificial Intelligence.

Each stage in the design thinking phase provides importance to some aspect of the overall solution – from empathizing with the actual user to rapid prototyping. Each of these stages can draw a parallel with building a great AI solution.

## 1. Empathize

*Benefit For AI: Helps in identifying the unarticulated AI opportunities, promotes a bottom up approach*

Almost every enterprise is trying to automate their processes and AI is an unavoidable part of these initiatives. These initiatives are usually driven in a top down approach. However, the design thinking approach flips this on its head bringing the human user to the center of the solution, thus making it a bottom up approach.

The design thinking approach requires you to interact closely with the stakeholder and empathize with them to identify the pain points. During this interaction, the AI consultant, armed with the knowledge of the vast possibilities of AI can quickly identify opportunities for improvement. This means that even if the stakeholder does not articulate some concerns, one is still able to catch these and visualize a super-efficient future for them.

AI consultants needs to be capable of identifying human actions that leads to human decisions. This is key as it is important to create and collect training data which might not even exist today. The human centric approach of design thinking aids this facet of data creation for automation scenarios as we have a better understanding of how the various stakeholders. This may, at times, even lead to a modification of existing processes to capture subtle human actions.

It is also important to understand the current technological landscape of the enterprise. This is a critical step as the key decision makers would want to understand the technological shift that may be needed as part of our solution. Moreover, adopting AI into enterprise often needs a shift in mindset about how the operations are run. This phase gives you a chance to empathize with the various stake holders and understand their concerns about this shift.
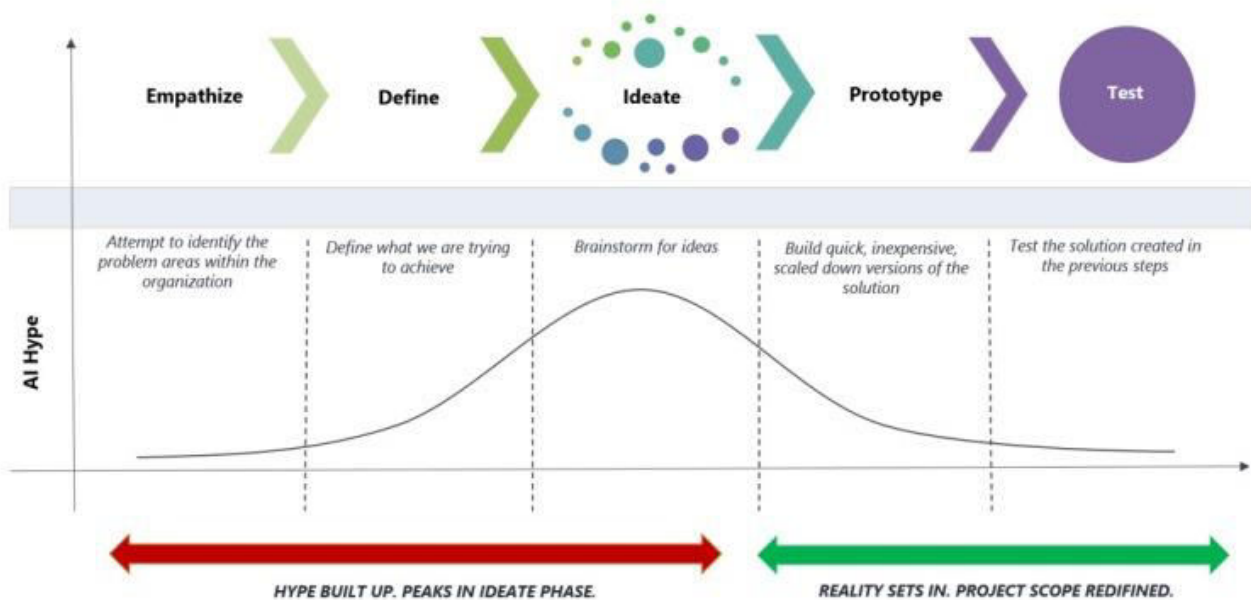
## 2. Define

*Benefit for AI: Helps in defining the problem statement in a human centric way, thereby reducing anxiety*

AI is often associated with job displacement. As such, resistance of AI solutions are often felt while interacting with stake holders. However, AI today should be viewed more as a solution that augments the capabilities of the work force, enabling them to reduce their workload on them. As such, a human centric definition of the problem statement would convey to the stake holder what they get as part of the overall solution. A statement like "Reduce effort by 50%" would do little to motivate the users to collaborate for an AI solution. On the other hand, "*Enable a more convenient execution of work*" might strike a chord with the work force.

## 3. Ideate

*Benefit For AI: Promotes out of the box thinking, challenging status quo, thereby aiding innovation*

This is a phase that allows the team to explore all the incredulous ideas. This stage allows users to challenge status quo, explore the unexplored and bravely imagine solutions akin to science fiction. Though expected to mimic human beings, automation offerings can follow a different set of rules as compared to human being for better efficiency. For example, in most automated warehouses, items are randomly placed as against an ordered fashion required by humans to do the job. The ideate stages helps us to unearth such radical and "not so obvious" possibilities for automation.



AI hype is often criticized, but in the design thinking process it is actually encouraged in the ideate stage. This actually powers innovation and helps in building out of the box solutions. As depicted in the diagram above, the AI peaks in this stage. Luckily, within the design thinking process, there is a mechanism in place to contain it in later stages.

## 4. Prototype

*Benefit For AI: Promotes a "Fail fast, fail safe" mindset. Letting reality kick in smoothly.*

This phase involves building quick proof of concepts. Design thinking encourages the philosophy of "Fail fast, Fail safe". Many benchmarking solutions out there may not be practical in production level solutions. It is often said that if you torture data hard enough, it will give you what you want. However, this will rarely be replicable in practical use cases.

Identifying the right use case candidate is a critical part of this whole process. Many practical problems in automation space have long tails. Human In The Loop (HITL) is the way forward. Spending 20% of effort to solve 80% of work makes an ideal case for HITL. Prototyping cases that meet these criteria should be the focus.

This phase reveals what is actually achievable within the AI ecosystem, bringing some sanity from all the hype built up in the previous stage. Here we quickly test hypothesis in AI and reduces the hype drastically. Furthermore, it lets the team

understand what all can be achieved via AI, staying within the limitation of the current technology maturity. Design thinking promotes a mindset that it is ok for PoC's to fail, as a failed PoC is one step closer to a successful solution.

## 5. Test

*Benefits For AI: Uncertainty is not frowned upon*

Testing AI solution needs a completely different mindset. It is often not possible to promise a given accuracy or performance for an AI solution. So it is always a moving target. That is because, the accuracy of the solution is highly dependent on the quality and quantity of data available in the enterprise. Unless one actually plays with the data, it might not be possible to confirm the accuracy of a solution at the beginning of a project. However, this mindset is often viewed cynically in the business world. However, in design thinking uncertainty is not frowned upon. In-fact it is expected facet of the overall process.

Moreover, one should note that AI solutions are expected to learn over time. The accuracy and target keep moving based on incoming data and feedback loops. Testing stage provides a feedback mechanism, allowing the team to see whether the solution is actually improving over time and more importantly whether it is able to achieve the required KPI's or not.

**Summary:**

Design thinking provides a framework that enables us to ask the right question at the right time while building an AI solution. Moreover, it promotes a mindset that accepts uncertainty, a major component for most complex AI projects. Design thinking tackles complex AI related problems by:

- Understanding the in-articulated AI opportunities within a process
- Reducing the apprehensions of the stake holder of the "dangers" of AI, thereby enabling better collaboration
- Allowing AI hype to grow that aids innovation while at the same time containing it at later stages
- Encouraging *'fail fast fail safe'* methodology, that empower AI engineers to test uncharted waters
- Bringing in a mindset to accept uncertainty in results, with an anticipation that the solution learns over time

Artificial Intelligence is the future and is every much intertwined with our life's. With more are more AI projects being taken up, design thinking helps promote the mindset and culture, so much required for enabling a AI-pro future.

## About the authors

Mr. Sojan George has over 11 years' experience in the IT industry and has been predominantly associated with the Artificial Intelligence domain. He currently works as a Business Development Manager at Tata Consultancy Services for the Artificial Intelligence Practice. Over the last 5+ years, he has interacted with multiple customers, across domains, in solving their pain points leveraging AI techniques (like Deep Learning, Shallow Learning, Natural Language Processing) and has helped shape their AI journey.

He has completed his BTech from Mar Athanasius College of Engineering, Kothamangalam, Kerala and his MBA from Leeds University Business School, United Kingdom.

Mr. Rajeev M Azhuvath is a hands-on technologist with 19 years of experience. Presently he is part of the Artificial Intelligence (AI) Program in TCS. Primary responsibilities include delivery of architecture focused on AI and building capabilities around shallow learning, deep learning, & natural language understanding.

The right mix of consulting experience, delivery experience, servicing experience, research experience, & futurism gives him the unbiased perspective of technology and its impact. Additional areas of interest include advances in Nano Technology, Bio Technology, Information Technology, & Cognitive Science (NBIC). Special interest in Convergence of Technologies & Technological Singularity and its impact to humanity.

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**"We must design for the way people behave,
not for how we would wish them to behave."**
Donald A. Norman, Living with Complexity