

AN EMPIRICAL STUDY ON THE APPLICATION OF DESIGN THINKING IN  
CONSULTING IN INFORMATION TECHNOLOGY INDUSTRY IN INDIA

by

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DISSERTATION

Presented to the Swiss School of Business and Management Geneva

In Partial Fulfillment

Of the Requirements

For the Degree

DOCTOR OF BUSINESS ADMINISTRATION

SWISS SCHOOL OF BUSINESS AND MANAGEMENT GENEVA

December 2022

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## **Dedication**

To all the people who have shaped my learning; to my parents Late. Mangaiah Kancharla and Late. Satyavedam Kancharla, to my teachers and professors, to my managers and mentors, to my clients and colleagues, to my wife Mary Rajeswari and my daughters Kezia Harshita, Nikia Sushmita.

## **Acknowledgements**

One more of my life's ambitions – my doctoral journey, is finally taking shape. Thanks to Almighty for His enablement, its 'Not my Merit ... but His Grace'.

My sincere and deepest gratitude to my mentor, Dr. Anna Provodnikova for her continuous support, prompt feedback, advice and encouragement throughout this dissertation's development. Thank you, it would have been impossible to complete the research work without your guidance.

I am equally indebted to my parents, who have bestowed upon me the greatest asset – education. They often said “Education is the only inheritance we can give you” and that they have given me aplenty, having nurtured the habit of learning since childhood.

I would like to put on record my sincere thanks to my wife, Mary Rajeswari for being a source of constant support and to my daughters Kezia Harshita and Nikia Sushmita for giving me the space to pursue my studies.

I am also thankful to all the practitioners, experts and executives who participated in this research. For their valuable insights and time that they took out to respond to my survey, to participating in the focus group discussion and executive interviews. In particular, I am grateful to Dr. Rajendra Prasad Teli, Mr. Ananth Krishnan, Dr. Adeel Shamsi, Dr. Jigna Srivastava, Mr. Mohan Mallari and Mr. Avadhesh Tewari for their constructive criticism and suggested corrections that kept my work on track. May the Almighty shower his blessings and mercy on each one of us.

Thank you everyone, I will always remain indebted for your contribution.

## ABSTRACT

### AN EMPIRICAL STUDY ON THE APPLICATION OF DESIGN THINKING IN CONSULTING IN INFORMATION TECHNOLOGY INDUSTRY IN INDIA

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Traditionally, the word 'Design' is used to describe the visual aesthetics of objects. However, the meaning of this word has evolved and it is not that limited anymore. In the context of business, design is not just about form or physical attributes; it is about a new method of thinking about products and services. 'Design Thinking' uses creative and innovative techniques to put customer needs at the heart of development strategy.

Design thinking in products is widely prevalent, design thinking in services is evolving. Though there have been many studies on application of design thinking in product development, and to some extent improving efficiency in services, there has not been much research focused on 'Design thinking in Consulting'.

The purpose of the current study is to provide a comprehensive review of design thinking as applied to business and outline a conceptual framework for applying the

principles and practices of design thinking to consulting in the information technology industry in India.

Design thinking Principles are the fundamental ideas or general rules that are true regardless of the circumstances, they are the propositions that serve as the foundation for design thinking (e.g., Human centered design). Design thinking Practices on the other hand are the tools or techniques by which the expected outcomes of the principles are achieved (e.g., Empathy maps). The matrix of the such principles applicable for consulting in its entirety along with associated practices, is the 'Design Grid', the proposed conceptual framework for this research.

The study covers information technology organizations in India, providing consulting services. Research method used was mixed methods methodology; online surveys with a larger set of consulting practitioners to address generality and focus group discussions with a smaller set of experts on specific consulting types plus qualitative semi-structured interviews with limited industry leaders to address particularity. The outcome of this study will be relevant to both the organizations and practitioners in the IT industry.

Results from survey were tabulated on five themes - consulting capability, design thinking awareness, design thinking principles, design thinking practices and design thinking in consulting. The first four themes are results from the survey. The fifth theme is results from focus group discussions.

Findings revealed a very strong consulting capability and a high level of awareness of design thinking amongst respondents. In the focus group discussions - all

five design thinking principles and twelve design thinking practices of the Design grid found applicability in all the consulting phases across all consulting types, demonstrating the breadth and depth of usage of design thinking principles and practices.

Leaders from the Indian IT industry acknowledged survey findings and advocated that the conceptual framework (i.e.) the ‘Design grid’ can be a force-multiplier for applying Design thinking in Consulting.

## KEYWORDS

Understand context, Current state assessment, Target state definition, Analysis & findings, Report & recommendations, IT Strategy consulting, IT Architecture consulting, IT Portfolio management, IT Process consulting, IT Governance consulting, IT Infrastructure consulting, IT Outsourcing consulting, IT Transformation consulting, Human centered design, Embrace ambiguity & diversity, Openness to radical collaboration, Co-create impactful solutions, Implement & iteratively improvise, Empathy maps, User personas, How might we, Storyboarding, Interviewing techniques, Brainstorming, Business model canvas, Journey maps, Affinity diagrams, Raskar's hexagon, Morphological analysis, Value proposition canvas and Design grid.



## TABLE OF CONTENTS

List of Tables .....	xi
List of Figures .....	xii
CHAPTER I: INTRODUCTION.....	1
1.1 Introduction.....	1
1.2 Research Problem .....	2
1.3 Purpose of Research.....	3
1.4 Significance of the Study .....	3
1.5 Research Questions.....	5
CHAPTER II: REVIEW OF LITERATURE .....	7
2.1 Introduction.....	7
2.2 Theoretical Framework.....	8
2.3 Summary .....	42
CHAPTER III: METHODOLOGY .....	45
3.1 Introduction.....	45
3.2 Overview of the Research Problem .....	45
3.3 Research Purpose and Questions .....	46
3.4 Research Design.....	48
3.5 Population and Sample .....	50
3.6 Participant Selection .....	52
3.7 Instrumentation .....	54
3.8 Data Collection Procedures.....	57
3.9 Data Analysis .....	60
3.10 Research Design Limitations .....	62
3.11 Conclusion .....	63
CHAPTER IV: RESULTS.....	65
4.1 Introduction.....	65
4.2 Results of Survey .....	66
4.3 Results of Focus Group Discussions.....	75
4.4 Results of Executive Interviews.....	87
4.5 Conclusion .....	88
CHAPTER V: DISCUSSION.....	89
5.1 Introduction.....	89
5.2 Discussion on Findings from Survey .....	90

5.3 Discussion on Findings from Focus Group Discussion.....	101
5.4 Discussion on Findings from Industry Leader Interviews.....	137
5.5 Conclusion .....	140
CHAPTER VI: SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS.....	142
6.1 Summary.....	142
6.2 Implications.....	147
6.3 Recommendations for Future Research.....	147
6.4 Conclusion .....	148
REFERENCES .....	151
APPENDIX A SURVEY - COVER LETTER.....	154
APPENDIX B SURVEY - QUESTIONNAIRE.....	155
APPENDIX C FOCUS GROUP DISCUSSION - PROCESS .....	166
APPENDIX D FOCUS GROUP DISCUSSION - PROCEEDINGS .....	168
APPENDIX E EXECUTIVE INTERVIEW - INFORMED CONSENT.....	213
APPENDIX F EXECUTIVE INTERVIEW - GUIDE.....	214

## LIST OF TABLES

Table 4.1 Participants Education Distribution .....	66
Table 4.2 Participants Total Experience Distribution.....	67
Table 4.3 Participants Consulting Experience Distribution.....	67
Table 4.4 Consulting Capability Distribution.....	68
Table 4.5 Design Thinking Awareness Distribution.....	69
Table 4.6 Design Thinking Principles .....	69
Table 4.7 Design Thinking Principles Applicability to Consulting Phases.....	70
Table 4.8 Design Thinking Principles Applicability to Consulting Types.....	71
Table 4.9 Design Thinking Practices .....	72
Table 4.10 Design Thinking Practices Applicability to Consulting Phases .....	73
Table 4.11 Design Thinking Practices Applicability to Consulting Types .....	74
Table 4.12 Participation in Focus Group Discussions .....	76
Table 4.13 Focus Group Discussion – IT Strategy Consulting Design Grid.....	77
Table 4.14 Focus Group Discussion – IT Architecture Consulting Design Grid .....	78
Table 4.15 Focus Group Discussion – IT Portfolio Management Design Grid.....	79
Table 4.16 Focus Group Discussion – IT Process Consulting Design Grid.....	80
Table 4.17 Focus Group Discussion – IT Governance Consulting Design Grid.....	82
Table 4.18 Focus Group Discussion – IT Infrastructure Consulting Design Grid .....	83
Table 4.19 Focus Group Discussion – IT Outsourcing Consulting Design Grid .....	85
Table 4.20 Focus Group Discussion – IT Transformation Consulting Design Grid .....	86
Table 5.1 Design Grid for Design Thinking in IT Strategy Consulting .....	105
Table 5.2 Design Grid for Design Thinking in IT Architecture Consulting.....	110
Table 5.3 Design Grid for Design Thinking in IT Portfolio Management .....	113
Table 5.4 Design Grid for Design Thinking in IT Process Consulting .....	116
Table 5.5 Design Grid for Design Thinking in IT Governance Consulting .....	121
Table 5.6 Design Grid for Design Thinking in IT Infrastructure Consulting.....	126
Table 5.7 Design Grid for Design Thinking in IT Outsourcing Consulting.....	131
Table 5.8 Design Grid for Design Thinking in IT Transformation Consulting.....	136
Table 6.1 Design Grid for Design Thinking in Consulting .....	143

## LIST OF FIGURES

Figure 2.1 The Knowledge Funnel .....	15
Figure 2.2 Consulting Types.....	31
Figure 2.3 Consulting Cycle .....	34
Figure 2.4 Knowledge Funnel Re-imagined.....	41
Figure 5.1 Participant Profile – Education.....	90
Figure 5.2 Participant Profile – Total Experience .....	91
Figure 5.3 Participant Profile – Consulting Experience .....	91
Figure 5.4 Consulting Capability across Consulting Types.....	92
Figure 5.5 Design Thinking Awareness.....	94
Figure 5.6 Design Thinking Principles Applicability to Consulting Phases .....	95
Figure 5.7 Design Thinking Principles Applicability to Consulting Types.....	97
Figure 5.8 Design Thinking Practices Applicability to Consulting Phases .....	99
Figure 5.9 Design Thinking Practices Applicability to Consulting Types .....	101

# CHAPTER I: INTRODUCTION

## **1.1 Introduction**

Historically, the word ‘Design’ is used to describe the visual aesthetics of objects. However, the meaning of this word has evolved and it is not that limited anymore. The concept of ‘Design Thinking’ was developed by social scientist and Nobel laureate Herbert A. Simon. Everything that has been designed should be viewed as artificial rather than natural. Engineers, and designers more broadly, should be concerned with how things should be in order to achieve objectives and how to work (Simon and Laird, 2019).

Design thinking, fundamentally recognizes that design should achieve purpose and business goals not just beauty. Design thinking shifts the focus from a business-centric engineering solution (inventing a product based on a bunch of assumptions and crossing our fingers that it will work for customers) to a customer-centric solution (exploring cultural phenomena, observing how people behave and think, gaining insights into what they need, and designing a product around that).

The objective of the method is to encourage creativity and find innovative solutions to challenging business problems, not to turn business people into real designers. Instead, it builds on the notion that there is much to be learn from the way designers think and work (Heerema, 2015).

The study covers information technology organizations in India, providing consulting services. The outcome of this study will be relevant to both the organizations

and practitioners who are keen to explore and employ human centered techniques in understanding the real needs of customers, co-creating solutions in a collaborative manner and providing value-based recommendations.

## **1.2 Research Problem**

Design thinking in products is widely prevalent, Design thinking in services is evolving. Though there have been many studies on application of design thinking in product development, and to some extent improving efficiency in services, there has not been much research focused on Design thinking in Consulting.

However, depending on the project's goals, the consulting firm's organizational culture, the design maturity of the client organization, and the consultant's experience and function, design can be used to consulting in a variety of ways. A co-creation workshop can serve as the design component, or the entire engagement could be design-led, in which case the design thinking process and its guiding principles would substantially influence consultants' work throughout the entire project (Juurikka, 2021).

Principles are the fundamental ideas or general rules that are true regardless of the circumstances, they are the propositions that serve as the foundation for design thinking (e.g., Human centered design). Practices on the other hand are the tools or techniques by which the expected outcomes of the principles are achieved (e.g., Empathy Maps). The matrix of the such principles applicable for consulting in its entirety along with associated practices, is the Design grid, the proposed conceptual framework for this research, to explore how design thinking can be applied to consulting in the information technology industry in India.

### **1.3 Purpose of Research**

The purpose of the current study is to provide a comprehensive review of design thinking as applied to business and outline a conceptual framework for applying the principles and practices of design thinking to consulting in the information technology industry in India.

#### **Specific Aims:**

1. To understand the different types of consulting engagements and how they are executed in the Indian IT industry.
2. To understand how design thinking is generally perceived in the Indian IT industry.
3. To evaluate what design thinking principles and practices can be adopted in consulting engagements across the consulting phases, in the Indian IT industry.

### **1.4 Significance of the Study**

In consulting, conventionally partners and practitioners engage only with executives in the client organization. This approach is perfectly valid to meet the objectives of the engagement in line with the terms of reference from a practitioner's perspective. However, when seen from the end customer's perspective as in the client's organization or the extended customer (i.e.) the client's customer – the consumer's, point of view, opportunities for improvements may surface - be it in the form of a problem, a process, a person or a proposition, a symptom or a solution.

In such context, a contemporary thought like design thinking would work best, especially for a world in which enterprises would be embracing digital technologies and end-users would be demanding enhanced customer experiences. Practitioners can exploit existing knowledge from conventional consulting or explore knowledge for contemporary consulting; while these combinations are at best incremental innovation's, the disruptive determinant is in design thinking.

The advantages of design thinking include choosing how goods and services are distributed (by linking systems, locations, and the final delivery of a designed and managed customer experience), choosing how interpersonal relationships are handled (between clients, design consultancies, stakeholders, end-users, or customers), and choosing how teams, processes, and procedures are structured (Best, 2011).

Additionally, design thinking in consulting can enable four key targets (Juurikka, 2021):

- A focus on the needs of the client, resulting in improved customer service and product and service offerings
- A collaborative, open strategy approach that fosters new, innovative concepts and organizational transformation with less turbulence
- A problem-centric strategy that results in the discovery of new development opportunities and, as a result, new projects with the customer going forward
- The use of experimental strategy, which results in more informed, fact-based decisions and, ultimately, better investment choices.



Design thinking, thus paves the way to produce solutions that generate new meanings and activate diverse elements like cognitive, emotional and sensory, involved in the human experience, by understanding cultures, experiences, emotions, thoughts and behavior to provide inspiration to design thinking in consulting to not just succeed but also sustain.

The results of this study will be valuable to consulting practitioners and information technology service providers in executing engagements in a human-centric manner keeping the end customer in mind, in co-creating solutions in a collaborative manner and in implementing recommendations iteratively.

Furthermore, the novelty of the research lies in design thinking discovering a new field for application - consulting services in IT industry and consulting practitioners / practices in IT can now deliver advisory services leveraging a contemporary technique like design thinking. The innovation lies in the design of the conceptual framework - Design grid, a matrix of principles and practices of design thinking.

### **1.5 Research Questions**

The main question of the research study is to explore, evaluate and extrapolate how design thinking can be applied to consulting in the information technology industry in India.

#### **Sub-Questions**

- What are the different types of consulting engagements and how are they executed in the Indian IT industry?
- How is design thinking generally perceived in the IT industry?

- What design thinking principles can be adopted in consulting engagements across the consulting phases?
- What are the design thinking practices related to the above principles and how can they be adopted in consulting engagements across the consulting phases?
- What are the potential benefits / perceived challenges of applying design thinking to consulting?

## CHAPTER II: REVIEW OF LITERATURE

### **2.1 Introduction**

The turn of the century saw IT service providers in the Indian IT industry move up the value chain from delivering technology solutions to providing advisory services. Consulting offerings included - IT Strategy, IT Organization design, Enterprise architecture, Portfolio management, IT Process consulting, Infrastructure and Outsourcing consulting. The first movers, also capitalized on the white space where technology intersects business and built offerings around IT Enabled business transformation. Around the same time, pure play Management consulting firms also tapped this opportunity and integrated their business services downward to include technology advisory.

Over the last two decades, this industry grew and the conventional consulting services matured. Consulting firms are now in need of a new value proposition to differentiate and deliver in the digital world. Can a human centered approach like design thinking be the right answer? The study hopes to answer this question.

Empirical research utilized for this literature review was gathered by conducting various searches within electronic databases, like Google Scholar, Research Gate, Springer and published books on Consulting, Design thinking and Innovation.

## **2.2 Theoretical Framework**

The theoretical framework looks at design thinking starting with evolution, followed by definitions, application of design thinking in business in general, overview of design thinking principles and practices as relevant to consulting and finally leading to Design grid – the conceptual framework for design thinking in consulting.

### **2.2.1 Design Thinking Evolution**

In 60's America, professions like industrial design and product design made their first small steps to distance themselves from engineering and the sciences. However, they did not get very far, industrial design was still mostly based on quantifiable facts, things that could be proven, measured and improved upon, designer's workplace was still in a university laboratory or on a factory floor.

Around the same time in Europe, Scandinavian participatory design or cooperative design was also getting off the ground. Unlike the teams of experts assembling in America to fix the world, the Scandinavians invited everyone to become involved in discussions on design; here designers played the role of facilitators or guides, with everyone from experts to workers and inhabitants co-designing products and services they would want to use.

Norman (2013) a design theorist redefined participatory design into what he coined as 'User-Centered Design'. User testing became less about usability and more about a user's interests and needs. Another significant shift in ideology was the placement of the user at the center of the development process, emphasizing experience

over efficiency and adopted a more humanistic approach with the involvement of the user throughout the development of a product or system.

Human centered design evolved in late 1990s when the development of methods described above shifted from technology driven focus to a humanized one. The holistic perspective introduced in service design allowed human centered design to transform from a method to a mindset aiming to humanize the design process and empathize with stakeholders (Kancharla, 2021).

Cross (2010) a researcher in the field of human computer interaction, looked at what makes the way designers think and make decisions different to other professions and observes that “Everyone can and does design. We all design when we plan for something new to happen, whether that might be a new version of a recipe, a new arrangement of the living room furniture, or a new layout of a personal web page. Design thinking is something inherent within human cognition; it is a key part of what makes us human.”

In business context, design thinking was adapted by David Kelley who started a new program at Hasso Plattner Institute of Design (d-School) at Stanford, where students from different back grounds could nurture their creative talents and apply their new found skills to tough challenges. David Kelley also founded IDEO – a firm that pioneered the contemporary and current view of design thinking (Kelley and Kelley, 2013).

Tim Brown, an industrial designer and IDEO’s CEO, has been a great advocate for design thinking and innovation, promoting design thinking for non-designers. With the use of design thinking, people can match their demands with what is technologically

possible and what a workable business plan can turn into customer value and market opportunity (Brown, 2008).

The traits of the design process—problem and solution centered, hypothesis-driven, and interested in the specific and concrete—are strongly convergent across the last 60 years of works in design theory. It is best suited to decision situations with high levels of uncertainty and ambiguity since it relies on abduction and anticipates cycling through numerous experiments testing a number of alternatives in an iterative manner (Liedtka, 2013).

Reflecting chronologically, there is not much evidence of application of design thinking to consulting either conceptually or even empirically.

### **2.2.2 Design Thinking Definition**

Design thinking is the search for a magical balance between business and art, structure and chaos, intuition and logic, concept and execution, playfulness and formality, and control and empowerment. Design thinking is ultimately a cultural framework for organizations that successfully apply it to challenges. Due to the fact that certain design concepts come from traditional design disciplines, design thinking has made it possible to use design ideas in a larger and more complicated commercial context (Mootee, 2013).

There is no standardized definition of design thinking because it is a complex idea (Kleinsmann et al., 2017).

Currently, it is believed that design thinking is a mode of thinking that results in organizational change, innovation, and new ways of running a firm. Within organizations

and businesses, design thinking has the capacity to execute and foster innovative thinking (Tschimmel, 2012).

Design thinking identifies and investigates with known and ambiguous aspects of current situation to discover hidden parameters and open alternative paths that may lead to the goal. Because design thinking is iterative, intermediate “solutions” are also potential starting points of alternative paths, including redefining of the initial problem, in a process of co-evolution of problem and solution.

Design thinking employs divergent thinking as a way to ensure that many possible solutions are explored in the first instance, and then convergent thinking as a way to narrow these down to a final solution. Divergent thinking is the ability to offer different, unique or variant ideas adherent to one theme while convergent thinking is the ability to find the correct solution to the given problem. Design thinking encourages divergent thinking to ideate many solutions (possible or impossible) and then uses convergent thinking to prefer and realize the best resolution.

Design thinking integrates what is desirable from a human point of view with what is technologically feasible and economically viable. Design thinking relies on our ability to be intuitive, to recognize patterns, to construct ideas that have emotional meaning as well as functionality. Design thinking is a term used to describe a set of guidelines that are used by a variety of people to solve a variety of issues. The supporting components of an effective design are: Insight - learning from the lives of others, Observation - listening to and seeing what other people don't say or do, and Empathy - putting oneself in another person's shoes (Brown, 2009).

Key tenets of design thinking that are consistently found in design thinking organizations are – thorough grasping of the user and a quest to find the correct problem to address, combining empathy with teamwork, accelerating learning via practical experimentation and visualization through quick prototypes, and integrating business model innovation should into the design thinking process (Lockwood and Papke, 2018).

Faud-Luke (2009) a design researcher synthesizes the various definitions of design thinking succinctly as follows - “The real ‘Joy’ of design is to deliver fresh perspectives, improved well-being and an intuitive sense of balance with the wider world. The real ‘Spirit’ of design elicits some higher meaning. The real ‘Power’ of design is that professionals and laypeople can co-design in amazingly creative ways. The real ‘Beauty’ of design is its potential for secular, pluralistic expression. The real ‘Strength’ of design is this healthy variance of expression. The real ‘Relevance’ of design is its ability to be proactive. The real ‘Passion’ of design is in its philosophical, ethical and practical debate.”

The diverse characteristics of design thinking through the above definitions, does evoke the plausibility of application of design thinking to consulting.

### **2.2.3 Design Thinking in Business**

Thomas Watson, CEO of International Business Machines (IBM) recognized in 1950 that “Good design is good business” (Di Dio et al., 2022). Good design generates social and economic value, makes the world a better, more interesting place, and enhances the quality of our lives.



Organizations have to develop and deliver some kind of products or services in order to exist and to operate, which means they engage in design not by choice but out of necessity. Utilizing design within a company frequently begins with the creation of products and services, where there is a strong connection to the target market (Junginger, 2015).

Organizations may engage in ‘Exploration’ the search for new knowledge or ‘Exploitation’ the maximization of payoff from existing knowledge. Both activities create value, and both are critical to the success of any organization. Very few companies balance exploration and exploitation, they end up choosing one of them they like and encourage analytical thinking, the alternative is frightening the knowing without the reasoning of intuitive thinking. The answer is not to try to get corporations to embrace the randomness of intuitive thinking and eschew analytical thinking, we cannot do without hat either entirely. The answer lies in a third form of thinking – design thinking that helps a company both hone and refine within the existing knowledge stage and generate the leap from stage to stage continuously (Martin, 2009).

From an organizational standpoint, design functions in conjunction with a variety of other disciplines, organizational divisions, and roles. The design process is helpful as a method and tool for strategic change from the perspective of the customer because it adopts a user-centered approach in the development of new processes, products, and services rather than focusing on internal hierarchies or traditional core competencies of traditional business structures (Best, 2011).

Persons or organizations instilled with design thinking discipline are consistently seeking a fruitful balance between reliability and validity, between art and science, between intuition and analytics and business exploration and exploitation. The business world is a reliability-oriented place, bulk of the organization therefore would be reliability driven design thinkers. But the organization also needs validity driven people to keep the organization from stagnating through over exploitation and under exploration.

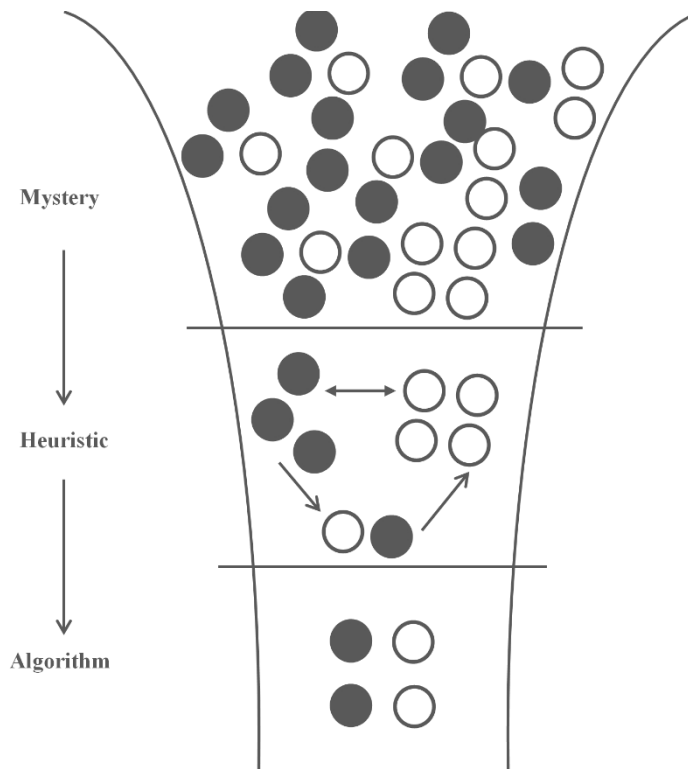
The role of design in strategy development is not a brand-new subject for academic study. Four design-led strategy practices—simulating, reviewing, cooperating, and conversing—can help strategists incorporate design thinking into their management practice. Managers interact with the design thinking information both individually and collectively. Individually, they react to the data and share their opinions with others. Beyond what is feasible in the boardroom, design-led strategy techniques enable managers to build understanding about their market contexts through observation and participation (Knight et al., 2020).

In order to be effective, design thinkers need to embrace the challenges of the extremes, empathize with colleagues who exist in the extremes of analysis and intuition, communicate with analytical thinkers and intuitive thinkers speaking the language of reliability and validity, using analogies for reliability driven colleagues and data or reasoning with validity driven colleagues.

In ‘The Design of Business’ (Martin, 2009) Roger Martin balances exploration of new knowledge (innovation) with the exploitation of current knowledge (efficiency)

through the ‘Knowledge Funnel’ to regularly generate breakthroughs and create value for companies.

Knowledge funnel is a three-stage process, Figure 2.1 shows how knowledge proceeds through the funnel.



*Figure 2.1*

*The Knowledge Funnel*

Source: Martin, R. (2009). *The design of business: Why design thinking is next competitive advantage*. Harvard Business Press.

The first stage of the funnel is the exploration of a ‘Mystery’, which takes an infinite variety of forms. The next stage of the funnel is a ‘Heuristic’, a rule of thumb that helps narrow the field of inquiry and work the mystery down to a manageable size. As an organization puts its heuristic into operation, studies it more and thinks about it intensely

it can convert a general rule of thumb to fixed formulae, that formula is an ‘Algorithm’ the last stage of the knowledge funnel. Design thinking focusses on accelerating the pace at which knowledge advances from mystery to heuristic to algorithm (Martin, 2009).

Information technology industry is knowledge intensive, the unknowns in the consulting business are far too many; the knowledge funnel depicting the flow of knowledge from mystery to heuristics to algorithms would surely be a blessing to practitioners.

### **2.2.3.1 Design Thinking in Products**

Throughout most of history, design was a process applied to physical objects. Frank Lloyd Wright designed houses. Charles Eames designed furniture. David Kelley designed products, including (most famously) the mouse for the Apple computer (Brown and Martin, 2015).

GE Healthcare MRI scanner, design of which had been submitted to International Design Excellence Awards. The designer visited a pediatric hospital to get feedback on the new features, but what the designer witnessed was anxiety and fear his machine caused among the most vulnerable patients, that experience triggered a personal crisis that forever changed his perspective towards design. He learned about human centered approach to design and innovation, he observed and talked to users, he collaborated with managers from other companies, he reached out to pediatric doctors, care givers, teachers, all this cross pollination of ideas made him feel more creative. By thinking holistically about how children experienced and interacted with the technology, the designer transformed the MRI suite into a kid’s adventure story with the patient in a

starring role – the MRI suite became a pirate ship / spaceship with all the technical processes now enacted as adventures (Kelley and Kelley, 2013).

Herman Miller chair, the challenge before the designers was to start with a clean slate and step back from their own assumptions about form and materials to design a totally new kind of chair. What do people really need when they sit down to work? A chair must look good and feel comfortable, and it must also provide ergonomic support and easily adjustable for whatever task taken. The designers visited many offices and spoke to several people who sit in chairs all day to understand how many different tasks people perform, how the chairs work for and against them as they move. Then reasoned out, what a chair ideally suited might be. Resulting design was a chair was made from porous, screenlike material for seat and back, helps even people shift and move as opposed to conventional upholstery which retained too much heat, forcing people to change positions while seating (Martin, 2009).

Frister & Rossman sewing machine, the designer put usability at the forefront of his thinking. The new design features arose out of functional, practical approach leveraging personal experiences. Conventionally, the sewing machine is placed centrally on the base platform, whereas the user needs more space on their side of the needle than behind it; because once the work is behind the needle you can do nothing about it, its sewn. To overcome this and to make the sewing machine more usable, the designer simply moved the sewing machine mechanism rearwards on its base (Cross, 2010).

Oral-B toothbrush for children, the most important time to learn to brush thoroughly and regularly is as a child, yet for decades kid's toothbrushes were smaller

versions of adult brushes. Designers at IDEO, discovered the ‘Fist phenomenon’, little kids grasp the brush with their fist, unlike elder kids or adults who grasp with their fingertips. So, they designed a soft squishy grip that would be easier for them to handle. The new squish grip brushes looked and felt like toys, a good thing when you consider that the longer kids brush, the better (Kelley, 2016).

### **2.2.3.2 Design Thinking in Services**

Service design may be described as a service-specific application of design thinking, and has the following definition: ‘Designed offerings to provide experiences that happen over time and across different touch-points’. Service design, therefore is as much about the ability of the organization to deliver an offering, as the design of the offering itself, is about choosing the most relevant touch-points for service delivery and designing a consistent customer experience across these many touch-points.

The many innovation opportunities that designing with touch-points offer are:

- Creating consistency across touch-points
- Introducing new touch-points
- Replacing touch-points
- Optimizing individual touch-points
- Expanding the service journey by adding touch-points at earlier or later phases of the journey (Luders et al., 2017).

Innova Schools launched its initiative to bring affordable education to Peru by holding information sessions on its interactive-learning approach with local parents and

teachers. Designing a new model – designers from Intervention Design, began by exploring the lives and motivations of Innova’s many stakeholders to find out how it create a system that would engage students, teachers and parents. Ideas began to crystallize around a technology enabled model that shifted the teacher from ‘sage on stage’ to ‘guide on the side’. Piloting the program - pilots were run in two 7<sup>th</sup> grade classrooms in two schools. Teachers were thoroughly trained and the model was repeatedly adapted to address their real-time feedback. Implementation evolution – the technology enabled model has been implemented in all of Innova’s 29 schools. Innova continues to work with its 900 plus teachers, seeks feedback from teachers, and students and iterates on its methodology and curriculum (Brown and Martin, 2015).

Arvind Eye Care System, the challenge the company faced is logistics; how best to deliver eye care to populations far removed from urban areas where Aravind’s hospitals are located. The company saw its network of hospitals as a beginning rather than an end. Most of its innovative energy has focused on bringing preventive care and diagnostic screening to the countryside, by holding ‘eye camps’ in an effort to register patients, administer eye exams, teach eye care and identify people who may require surgery or advanced diagnostic services or who have conditions that warrant monitoring. In 2006 and 2007 Aravind eye camps screened more than 500,000 patients of whom nearly 113,000 required surgeries. Over the years it has bolstered its diagnostic capabilities with telemedicine trucks, which enable doctors back at Aravind hospitals to participate in care discussions. All these services are free for roughly 60% of patients who cannot afford to pay. Throughout its history – defined by the constraints of poverty,

ignorance and an enormous unmet need, Aravind has built a systemic solution to a complex social and medical problem (Brown, 2008).

Dr. Reddy's, a Hyderabad based pharma major in India, has its own design thinking center called Studio 5B. The studio has an inspiring purpose, to use design thinking to inspire and create solutions that make a difference to health and everyday lives of people. Going well beyond the medicines that Dr. Reddy's discovers and manufactures, the lab prides itself in deeply engaging with patients and their contexts, including family members, care providers and the healthcare community at large. Applying a design thinking approach, Dr. Reddy's launched a new corporate identity in 2015. Their new heart shaped logo is an expression of empathy and dynamism which helps keep patients at the center of everything that Dr. Reddy's does. The belief, 'Good health can't wait' lends new meaning to their core purpose of accelerating access to affordable and innovative medicines (Soni, 2020).

#### **2.2.4 Design Thinking Principles**

Principles are fundamental ideas or general rules that are true regardless of the circumstances, they are the propositions that serve as the foundation for design thinking, they are Human centered design, Embrace ambiguity & diversity, Openness to radical collaboration, Co-create impactful solutions, Implement & iteratively improvise; each of the principles are explained below (Kancharla, 2021):

##### **1. Human centered design**

Human centered design, as the name implies is keeping humans / users / customers or simply put people at the core. No matter what is being designed, whether



it's a product or a service or a solution or building, focus is always kept intact on the user; empathizing with, learning more about and testing findings with users, iterating till the right insights are nailed and ideas made tangible.

## **2. Embrace ambiguity & diversity**

Innovation through iteration is at the core of design thinking, for which there has to be a free flow of ideas, irrespective of whether they are right or wrong. Ambiguity is recognition of this fact, there are multiple variables each with possibly multiple values. Diversity refers to the breadth, of stakeholders, contributors and critics from varied disciplines. Both ambiguity & diversity are a reality and are essential to design thinking, as they force understanding the problem from multiple perspectives, facilitates an open-minded approach fostering flexibility and thinking from first principles.

## **3. Openness to radical collaboration**

Openness to radical collaboration implies learning from diverse perspectives of people from different backgrounds skills, abilities and thinking preferences to come together; on the contrary to traditional collaboration relies on so called experts. Radical collaboration embraces multiple perspectives and enables breakthrough insights and solutions to emerge from the diversity, which are the essential ingredients of innovation. Radical collaboration is practical in reaching agreements in which all parties feel respected and have their interests met, while building long-term relationships, a characteristic that is key to articulating recommendations.

#### **4. Co-create impactful solutions**

Co-creation stems from an active dialogue and well channeled interaction between stakeholders. Co-creation promotes emotional engagement of the stakeholders and ensures alignment of diverse perspectives. The participative approach allows stakeholders to free up their inhibitions and freely ideate, because of the trust co-creation fosters. In co-creation, the ability to assemble and work with heterogeneous teams is key. Though the diverse profiles, broad expertise and deep experience of the heterogeneous teams can surely identify innovative ideas, co-creation must still be conducted through a dialog between stakeholders without losing focus on end users.

#### **5. Implement & iteratively improvise**

In design thinking, the final stage though commonly referred to as test, implies both test and implement. The uniqueness of design thinking is that, as an approach it allows for improvisations even at this stage as long as they are incremental in nature. Furthermore, if it is beyond incremental and tending to be radical or disruptive, the approach still does not abandon the idea but recommends restart from ideation. What this principle provides for, is to see how the prototype performs and pro-actively work around the perceived shortcomings iteratively, in order to avoid any last-minute glitches in the product or service.

##### **2.2.5 Design Thinking Practices**

Practices are tools or techniques by which the expected outcomes of the principles are achieved, they are Empathy maps, User personas, How might we, Storyboarding, Interviewing techniques, Brainstorming, Business model canvas, Journey maps, Affinity

diagrams, Raskar's hexagon, Morphological analysis, Value proposition canvas; each of the practices are explained below (Kancharla, 2021):

### **1. Empathy maps**

Empathy maps are a simple yet powerful tool that captures knowledge about a single user or segment of users' behaviors and needs. Empathy map is a 2x2 matrix where each quadrant is labelled with a category that explores the user's external, observable world, and internal mindset; what the user is Saying, Doing, Thinking, and Feeling (includes pains and gains).

The first step in an empathy map is to define the person or group of persons to understand and empathize with and identify desired outcomes. Next, capture the outside world, what do they see, what do they hear, what do they do or say. Then, explore the inside mind, what really matters to the users, the positives and negatives of their thoughts, what makes them feel good or bad, explore the specifics of their pains and gains, what is success and failure to the users. Finally summarize findings, take a moment to reflect, capture ideas and insights generated, take pictures to capture the moment.

### **2. User personas**

A persona in human centered design is the characterization of a user who represents a segment of the target audience. A user persona is a representation of the goals, desires, limitations and behavior of a hypothesized group of users. In most cases, personas are synthesized from data collected from interviews with users, details include behavior patterns, goals, skills, attitudes, and the environment, with a few fictional personal details to make the persona a realistic character.

Personas can be developed in many ways; common steps are collecting basic demographics, background information of target audience, segmenting the target audience, goals motivations and pains of the target audience and additional information like skills, brands, influences and social networks.

### **3. ‘How might we’**

Synthesizing insights from a human centered approach to problem solving into actionable statements, by pre-fixing ‘How Might We’ (HMW) is the crux of this practice. Meaningful insights generate several HMW statements and each one of them may provide one or more design opportunities, which in turn can lead to a healthy brainstorming session.

In practice, just start by prefixing HMW to an insight, if the insight reads, “users are confused to see many choices”, then a good how might we question can be “How might we reduce the number of choices with our users”. Having the question reframed, answer by providing ideas, opportunities or options. Ensure that the number of options are reasonably adequate. Compile all solution options and baseline them for brainstorming session.

### **4. Storyboarding**

Storyboard’s help visualize ideas, they capture attention, provide clarity and inspire stakeholders to act. Storyboards communicate a story through images displayed in a sequence of panels that chronologically map main events of a story. Storyboard’s sketch out an idea to depict how a user or a team may use a feature or experience an environment or realize a benefit in future even before starting development work, brings

a high-level clarity on a future state based and helps establish consensus among stakeholders at all levels.

Storyboard's have three broad components, the first component deals with Scenario planning - the person or user or a team that plays a role in a scenario or a story is clearly specified at the top with a short text description of the scenario. The second component are the actual Visuals - each step or phase in the scenario is represented visually in a chronological sequence. The third component is the Caption - each visual has a caption, describing the user's actions, environment, experience, feelings etc.

## **5. Interviewing techniques**

In interviewing a set of questions are asked and responses are recorded, a very simplistic definition, but the success of any interview depends on converting this process into a meaningful conversation wherein the stakeholders are comfortable. Making the interviewee at ease helps to have deeper conversation with possibility of more meaningful insights as outcome. It's a proven practice to ask open-ended question before asking yes-no type questions.

Interviews are categorized into two types – Expert interviews and Group interviews. Expert interviews are one-on-one conversations with subject matter experts. In Group interviews, interviewers get a chance to observe interviewee's behavior, agreements or dis-agreements in action, instead of relying only on responses. The flip side is restriction in free flow of thoughts.

## **6. Brainstorming**

Brainstorming is a creative problem-solving technique wherein ideas and solutions are generated through intensive and orchestrated group discussions, a proven method to tap into a broader body of knowledge of multiple individuals. Brainstorms work best when the group is positive, optimistic, and focused on generating as many ideas as possible without any hidden fears or resistance.

The key to effective brainstorming is choosing the right group and orchestrating the session. In choosing the group, invite the right people with right skills for an open discussion, more diverse the skill set, more diverse the background of individuals within the group, the better it is to present points / counter-points to make the discussion more productive. In orchestrating the session, there should be ways to control the discussion and steer it in the right direction at all times. The focus of brainstorming should be to generate as many ideas as possible. Goal isn't a perfect idea, its lots of ideas, collaboration, and openness to radical thinking.

## **7. Business model canvas**

A company's business model describes how it generates value for itself while providing goods or services to its clients. The business model determines what should be the core components of the organization and how they should function as a whole to generate value for the business. Business model canvas is a strategic management tool that allows practitioners to describe, design, challenge, invent, and pivot the organization business model (Osterwalder and Pigneur, 2010).

The canvas captures nine key components of a business model – Customer segments, Value proposition, Channels, Customer relationships, Revenue stream, Key resources, Key activities, Key partnerships and Cost structure.

## **8. Journey maps**

Journey maps, also referred to as experience maps, is a very powerful tool that provides stakeholders and product teams with a detailed understanding of the user so that they can ideate, prototype, test and create meaningful user-centered design. Journey maps systematically goes through the step's customers take both internal and external whilst interacting with a product or service.

Given that its practically impossible to map the journey of all users, creation of a persona helps. A persona is created for one person that best represents the target customer segment. The number of persona's required to be created is based on business needs, in most cases its one persona per customer segment. Persons that best fit the personas are engaged in fact finding discussions to understand his / her interactions with the product or service and their motivations.

## **9. Affinity diagrams**

Affinity diagrams is a great visual tool, to help you make sense of mixed data gathered through various sources such as ethnographic research, ideas from brainstorming, user opinions, user needs, insights, and design issues. Affinity diagrams or clustering exercises are all about organizing data into groups or themes based on their relationships.

A simple affinity diagram can be created by the following steps - note pieces of data, small documented facts onto post-it notes. Take one post-it and make it the first post-it in the first group. Take the next post-it and ask, "Is this similar to the first one or is it different?", then you will place it in the first group or into its own group, continue with the rest of the post-its'. You should now have 3-10 groups, name these groups, create information structure and discover themes. Rank the most important groups over less important groups. Depending on user priorities, markets, company's stakeholder's create connections with other groups using lines or other devices between individual bits of data or groups of data. Summarize what you have synthesized, for example, insights, user needs, pain points, or look for gaps you that are not yet addressed.

#### **10. Raskar's hexagon**

Raskar's hexagon or idea hexagon is a framework for arriving at new ideas from a given idea. At the core of using idea hexagon is the need of having a novel and convincing idea or solution, that successfully address a genuine problem. Once a right idea or solution is crystallized. Raskar's hexagon can then help arrive at new ideas stemming out of that particular idea or solution.

Raskar's hexagon provides six methods of arriving at a new idea - extending the idea to another dimension, combining two contrasting ideas, doing exactly the opposite of what is currently being thought of right now, finding every possible problem that the idea can solve, finding every possible solution to the problem, adding an adjective to the idea and making the idea more useful more effective.



## **11. Morphological analysis**

Morphological analysis is a creative problem-solving technique for systematically structuring and exploring all possible solutions to a multi-dimensional, complex problem and a powerful tool for generating creative ideas and designing a new product or service. The objective is to break down the system, product, or process problem at hand into its essential parameters or dimensions and to place them in a multi-dimensional matrix. Then find new ideas by searching the matrix for creative and useful combinations.

Illustrative approach to the morphological analysis - define the problem in a short and clear statement, identify attributes or determine suitable problem characteristics or parameters, identify alternatives and features for the different parameters, fill a grid with lists of alternatives, combing items from the lists, identify a new useful, interesting or potential combination within the grid, eliminate those combinations that are impossible or undesirable to execute, finally evaluate and select ideas to use or develop into practical solutions of the problem.

## **12. Value proposition canvas**

Value proposition canvas makes value propositions visible and tangible and thus easier to discuss and manage. The value proposition canvas zooms into value proposition and customer segment's building blocks of the business model canvas. Value proposition design - provides proof that your ideas work, gets buy-in from top management, access to resources, manages cannibalization and overcomes risk aversion (Osterwalder et al., 2014).

Value proposition canvas has two sides. With the customer profile you clarify your customer understanding, with the value map you describe how you intend to create value for that customer, you achieve fit between the two when one meets the other.

### **2.2.6 Design Thinking in Consulting**

Firstly, an overview of the various types of IT Consulting and the typical phases of an IT Consulting engagement, prior to applying the design thinking principles and practices along the re-imagined knowledge funnel.

#### **2.2.6.1 Consulting Types**

IT Consulting comprises of the following consulting types - IT Strategy consulting, IT Architecture consulting, IT Portfolio management, IT Process consulting, IT Governance consulting, IT Infrastructure consulting, IT Outsourcing consulting and IT Transformation consulting. Taken together they form the consulting spectrum the answer to business problem's when seen through an IT prism, abbreviated as SAPPGIO-T, akin to the VIBGYOR of a rainbow. The suffix T is the resultant Transformation, the pot of gold at the end of the rainbow for the business (Kancharla, 2016).

IT Strategy consulting, deals with alignment of IT to business, and is invariably coupled with one or more of the following – IT Organization design, Enterprise architecture and / or IT Infrastructure. The outcome of an IT Strategy consulting engagement is a well-thought of plan of action that provides adequate guidance on how to use technology resources across the enterprise and make decisions which help alignment to business and achieve corporate vision.

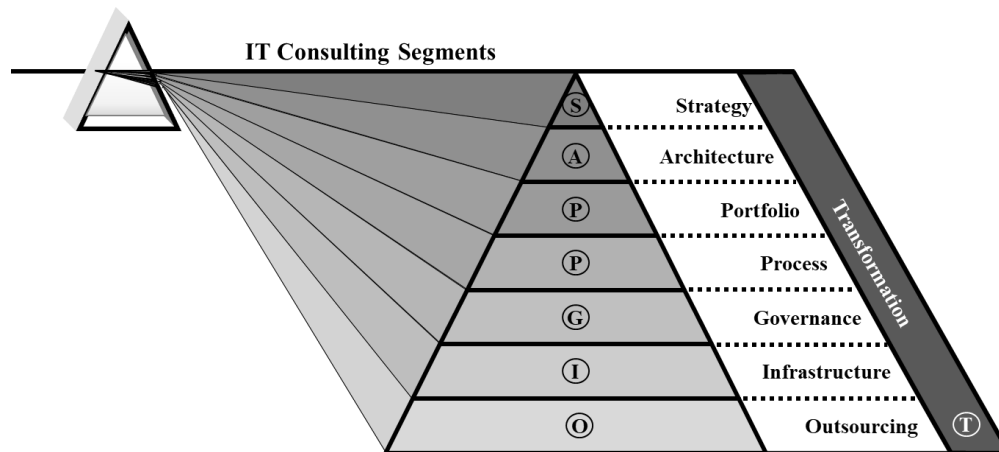


Figure 2.2  
Consulting Types

Source: Kancharla, M. (2016). *Consulting: A practitioner's perspective*. Notion Press.

IT Architecture consulting, deals with enterprise architecture definition and design. Enterprise architecture is an integration of business, application, information and technical architecture's that help IT become more agile to serve business requirements. A well-defined enterprise architecture demonstrates consistency in business processes, supported by aligned applications that make available reliable and secure information over an efficient infrastructure network.

IT Portfolio management, deals with alignment of the application portfolio to support the business, measured in terms of functional fitment to support the business and technical maturity that is future proof, collectively enabled through right distribution of IT Investments for optimal returns. The management of an IT Portfolio involves simplification of business processes, rationalization of applications, consolidation and / or virtualization of infrastructure and additionally management of IT Investments.

IT Process consulting, deals with definition, deployment, management, compliance and optimization of processes and services in order to improve productivity and deliver resilient IT services. In process consulting, improvement and optimization initiatives are continuous exercises; organizations should consider a progress appraisal once a year or two to measure the degree of improvement, success of implementation and impact of institutionalization.

IT Governance consulting, deals with the entity, the IT Organization. The role of IT Governance is to establish a structure that can maximize value delivered by IT, through proven governance processes. The structure in turn is strengthened by well-defined roles and responsibilities. The roles mandate specific decision-making mechanisms pertinent to the specific IT domain. The mechanisms are supported by measurements that rightfully reflect their performance and are monitored by empowered committees.

IT Infrastructure consulting, deals with planning and design of the required infrastructure components, budget distribution for capital expenditure and operational expenditure, right-selecting components and right-sizing configurations, operating level agreements and opportunities for consolidation or optimization. Infrastructure systems should scale gracefully to support increasing volumes, should be standardized on platforms that can support diverse set of applications with adequate security controls.

IT Outsourcing consulting, deals with organizational readiness for outsourcing, outsource-ability analysis of technology components, resource model based on capability

and capacity analysis, designing a sustainable outsourcing model, evaluation of best suited offshore locations and a mutually agreed upon service level agreement. Post outsourcing, organizations end up developing capabilities for improved quality and productivity.

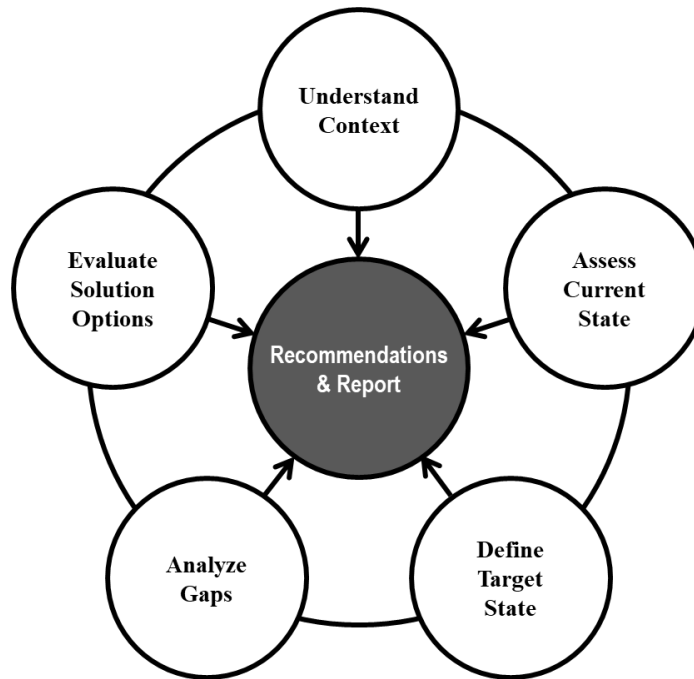
IT Transformation consulting, deals with IT Enabled business transformation, starting with understanding transformation drivers leading to right selection and relative positioning of the consulting types; both in terms of priority and prominence, holistic analysis of core and corollary consulting types, resulting in a series of cross functional recommendations for transformation. The outcome of a transformation programme depends on how clearly and comprehensively the transformation strategy, value and risks have been articulated and communicated to all stakeholders.

#### **2.2.6.2 Consulting Engagements**

In general, consulting engagements comprise of the following phases – a) Understanding context, b) Current state assessment, c) Target state definition, d) Gap analysis, e) Evaluating solution options and f) Report and recommendations. The six phases are valid from an engagement model perspective, however in execution mode, in most cases gap analysis and evaluation of solution options are merged together as Analysis & findings phase (Kancharla, 2016).

Understanding the past in terms of context and drivers is the starting point. In most consulting engagements there is no defined problem statement, what is known at best is a certain hypothesis. The first task therefore is to articulate this hypothesis and arrive at a problem statement. The objective of this phase is to understand the client

context and business drivers with an open mind, putting aside past experience to uncover the specificities.



*Figure 2.3  
Consulting Cycle*

Source: Kancharla, M. (2016). *Consulting: A practitioner's perspective*. Notion Press.

Understanding the past (context) naturally leads to assessing the present (current state) in terms of functional capability, competency of resources and culture of organization. The objective of this phase is to baseline the organization and the functional areas required to be covered by the engagement.

Having understood the past (context) and assessed the present (current state) the next logical step is defining the future (target state) in terms of the required functionality of the target environment. The objective of this phase is to visualize the required features of the target state and validate the gaps to be bridged.

Analysis & findings phase is core and critical to the success of the engagement, as the insights from these findings help shape the recommendations, the future course of action for the organization to realize its objectives. The objective of this phase is to analyze the gaps, evaluate solution options and validate findings from analysis.

The final phase of the consulting engagement, a culmination for all the hard work and a moment to gain credibility. The objective of this phase is to present recommendations and prepare the consulting report.

In executing consulting engagements, practitioners can exploit existing knowledge from conventional consulting or explore knowledge for contemporary consulting; while these combinations are at best incremental innovation's, the disruptive determinant is in design thinking.

An original method for tackling problems is provided by design thinking. As issue solving activities are naturally linked to consulting practices, design thinking-related interventions and mechanisms may have positive effects on consulting practices (Kostermans, 2019).

The respective teams must collaborate in the same department, ideally in the same location, in order to effectively mix design and consulting. Engagements could thus be carried out by diverse teams. A holistic perspective that is based on consumer behavior, data, technology, and business can be created by combining the diversity's worth and its potential. Typically, the designer brings in a customer-centric approach while the consultant adds a value perspective on what makes sense (Juurikka, 2021).

### **2.2.6.3 Application of Design Thinking Principles**

Human centered design - as a consultant interacts with stakeholders, adopting human centric approach provides an opportunity to discover not just hard facts, but aspirations, desires and hidden thoughts and behaviors of stakeholders, these are insights that conventional information gathering techniques may not yield. Such insights also help in analyzing and validating findings and iterating early in the consulting cycle to build solutions that resonate with the stakeholders; an opportunity for early buy-in and higher probability of recommendations being accepted.

Embracing ambiguity & diversity - ambiguity relates to scope and diversity relates to stakeholders, can be applied to Current state assessment or Target state definition to understand diversity of requirements and to Analysis & findings to acknowledge the ambiguity of findings.

Openness to radical collaboration – the principle provides opportunities to discover ideas and insights in the context of understanding drivers and incubate innovation in defining the target state. During analysis radical collaboration can come in very handy in identifying unforeseen issues and barriers that may become roadblocks at a later stage, it is a very effective means of identifying potential conflicts and proactively addressing them in early stages of solutioning.

Co-create impactful solutions - practitioners though rich in external knowledge, often spend a lot of time in getting to understand the internal dynamics of the client environment and are under immense pressure to bring out the right ideas at the right time. In such a context, bringing in diverse stakeholders and ideating through unbiased



dialogue, characteristic to co-creation, is a boon to practitioners in defining the target state, analysis and recommendations.

Implement & iteratively improvise - resonates with practitioners, as it removes inhibitions to implement for fear of failure on the part of clients and provides protection for both in the window of improvisation even post implementation.

#### **2.2.6.4 Application of Design Thinking Practices**

Empathy maps can help synthesize observations about client stakeholders and reveal deeper insights about client's needs. When included at early stages of consulting, empathy maps can help looking at things from client's point of view before proposing solutions or finalizing recommendations.

User personas help to better infer what a real person might need, which can further help in brainstorming, use case specification and features definition. Once established, proposed solutions can be guided by how well they meet the needs of individual user personas and deliver value.

HMW statements can be a powerful means of extracting action items that can address one or more insights. More critical to consulting because every phase throw's up more and more insights that would require logical and sequential evaluation as they shape the next stage. Therefore, techniques such as HMW statements come in handy as they aid in generating a series of options for action and in prioritizing / combining insights into initiatives that help achieve engagement objectives.

Storyboards are a powerful means of ideation. Storyboard's sketch out an idea to depict how a user or a team may use a feature or experience an environment or realize a

benefit in future even before starting development work, brings a high-level clarity on a future state based and helps establish consensus among stakeholders at all levels.

Interviews are at the heart of consulting and in every phase of the engagement. Talking to stakeholders in Understanding context, subject matter experts in assessing the current state and in defining the target state. Choosing the right technique relevant to the context, customizing the question bank dynamically based on insights captured or because of noticeable discomfort and maintaining minutes for forward integration or backward traceability becomes key.

Brainstorming enables stakeholders with diverse backgrounds to interpret the drivers in Understanding context, focus groups to accurately baseline the current state, generating of ideas to define the target state, openness in discussion to analyze the findings to determine feasibility of solution options and collaboratively converging to shape the recommendations.

Business model canvas helps to establish a common language among the stakeholders pertaining to the nine components and its relevance, across phases. In Current state assessment, it captures customer insights at high level, shifting the perspective to determine the envisaged business change. In Target state definition, the model describes the rationale as to how the organization will create, deliver and measure the value. In Analysis & findings, it poses ‘what-if’ questions to facilitate creation of better prototypes. In Report & recommendations, the framework assists in envisioning the organizations business model in short, medium and long-term horizons.

Journey map's help empathize with the customer or end user, provide a bigger picture and reveal the right opportunities. Specifically, in Current state assessment journey maps lay out touchpoints with the product or service and highlight opportunities for improvement. Journey maps can also be created for the desired target state based on interactions with personas, that can be used to reflect on the current state and identify the gaps to be bridged. Together these journey maps provide an inside-out and outside-in perspective of personas interaction with the product or service, which can indirectly help in analysis and recommendations.

Affinity diagrams is one of the most valuable practices of design thinking and can be applied across different phases of consulting. Information gathering is a continuous process in consulting, from Understanding context to Current state assessment to Target state definition and to Analysis & findings, the information gathered is interpreted and inferences made at every stage resulting in logical groups leading to deeper insights. Affinity diagrams help in deeper definition of problems and in developing ideas for solutions, steering analysis based on synthesis of insights.

Raskar's hexagon can help take ideas and solutions to the next level as well as generate new ideas. The solution or an approach or even a concept can be extended using the idea hexagon to benefit the larger enterprise, especially in transformational kind of engagements where the scope extends beyond one consulting type. The risk however, is the high degree of emphasis given to the starting idea or solution.

Morphological analysis has the ability to evolve at all possible solutions for complex problems is a much-wanted algorithm. Despite the best of efforts in

understanding context and assessing current state, when it comes to defining target state and analysis of findings, there are still a plethora of possibilities. Morphological analysis helps in structuring such possibilities, leading to uncovering innovative solutions.

Value proposition canvas comes in handy in articulating recommendations, plots value map against the customer profile. Ensures alignment of value from products and services to customer jobs and adequacy of pain relievers and / or gain creators in the value proposition.

#### **2.2.6.5 Design Grid – The Conceptual Framework**

Lastly the Design grid, a matrix of design thinking principles and practices can be leveraged as a conceptual framework (Kancharla, 2021) to apply design thinking in consulting.

Mysteries in the context of consulting are; the way the hypothesis is articulated to define the problem statement, the emphasis placed on executive leadership to provide strategic and operational directions, the assumptions made in order to deliver within the short duration of consulting engagements, the completeness of pre-formatted questionnaires used for information gathering, the presumptive notion that something is broken internally and therefore external help is being sought, the inherent tendency that a solution that worked elsewhere will work here also, the reliance on benchmarks to highlight the deviation, the expectation on recommendations to succeed in implementation. Mysteries expressed above are spread across the consulting phases and may vary depending upon the nature of the consulting type, hence, they are taken together to be the mystery to be addressed.

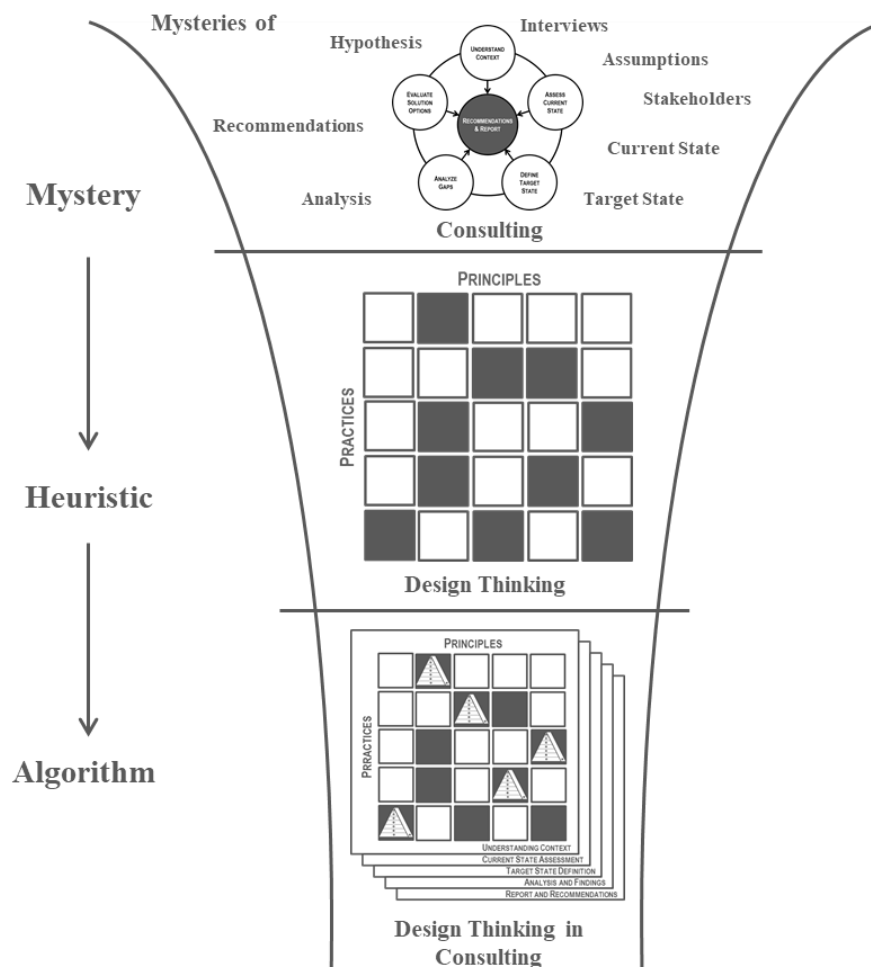


Figure 2.4

*Knowledge Funnel Re-imagined*

Source: Kancharla, M. (2021). *Design thinking in consulting: How to sustain your success in the IT consulting space*. Notion Press.

The Heuristic that can best solve the mysteries of consulting as summarized above are through design thinking; by exploring requirements from end customers and extended customers point of view, interactions with associates who are close to the problem at hand, early validation of assumptions, inclusive evaluation of enterprise’s ecosystem, in-house experiences in articulating corrections, business risk and business value balancing

and by bundling or un-bundling recommendations. Heuristics expressed above are tabulated in the Design grid, an innovative technique, based on careful evaluation of principles of design thinking and associated practices that can potentially enhance and extend the consulting solution.

Design grid is the starting point for the algorithm. Each principle in the Design grid defines ‘the what’, a characteristic or a contemporary thought of design thinking, that can be applied to consulting and can potentially enhance or enrich execution of the consulting engagement. And for each principle there are a set of practices describing ‘the how’, a tool or technique of design thinking, that helps in achieving the objective of the corresponding principle.

Given that each of the consulting phases are unique, the generic Design grid (i.e.) the pattern from the heuristic needs to be evaluated further to derive the phase specific Design grid. This involves identification of principles applicable to the consulting phase and evaluation of practices associated with the identified principles to short-list practices relevant to the particular consulting phase. The phase specific Design grid is further studied to understand the nuances for each of the consulting types as applicable, collectively this becomes the formulae or algorithm for design thinking in consulting.

### **2.3 Summary**

IT service providers in the Indian IT industry moved up the value chain from delivering technology solutions to providing advisory services. Consulting offerings include - IT Strategy consulting, IT Architecture consulting, Portfolio management, IT Process consulting, IT Governance consulting, IT Infrastructure consulting, IT

Outsourcing consulting and IT Transformation consulting. In execution, consulting engagements start with; Understanding context and move onto Current state assessment, Target state definition, Analysis & findings and conclude with Report & recommendations.

Design thinking as a concept started in the 1950s, evolving from industrial design to product design to user centered design. Design thinking in its simplest form is thinking as a designer would. In 'The Design of Business', Roger Martin introduced the 'Knowledge funnel' three-stage process, showing how knowledge proceeds through the funnel. The first stage of the funnel is the exploration of a Mystery, which takes an infinite variety of forms. The next stage of the funnel is a Heuristic, a rule of thumb that helps narrow the field of inquiry and work the mystery down to a manageable size, the heuristic. As an organization puts these heuristics into operation, the general rule of thumb gets converted to a fixed formula, that formula is the Algorithm, the last stage of the knowledge funnel.

Design thinking principles are; Human centered design, Embrace ambiguity & diversity, Openness to radical collaboration, Co-create impactful solutions and Implement & iteratively improvise. Associated design thinking practices are Empathy maps, User personas, How might we, Storyboarding, Interviewing techniques, Brainstorming, Business model Canvas, Journey maps, Affinity diagrams, Raskar's hexagon, Morphological analysis and Value proposition canvas.

Through the theoretical framework, it can be concluded that, there have been many studies on application of design thinking in product development, improving

efficiency in services, but there has not been much research focused on design thinking in consulting. Nonetheless, the literature provided a conceptual framework, in the form of a Design Grid – a matrix of design thinking principles and design thinking practices. Due to the nascent stage of this topic the proposed framework is an academic-based framework based on review of literature and researcher’s own research and experiences in the field.

The most important factors that significantly impact the research are the specifics of different IT Consulting types, these will be analyzed empirically by collecting data from practitioners in the IT industry through a questionnaire-based survey plus experts in specific consulting types through their participation in focus group discussions and semi-structured interviews with leaders from the IT industry in India, details of which will be explained in the following chapter on Methodology.



## CHAPTER III: METHODOLOGY

### **3.1 Introduction**

Research methodology is a way to systematically solve the research problem, it may be understood as a science of studying how research is done scientifically.

Researchers must comprehend the underlying presumptions of diverse strategies and be aware of the standards by which they can determine which techniques and processes will be appropriate for a given topic and which ones won't (Kothari, 2004).

This chapter provides an overview of the research problem and explains the research purpose and questions. Also includes the research design process, the rationale for choosing a qualitative approach followed by descriptions of research sample, participant selection criteria, research instruments used, data collection procedures, data analysis techniques and concludes with limitations of the research design.

### **3.2 Overview of the Research Problem**

Design thinking in products is widely prevalent, design thinking in services is evolving. Though there have been many studies on application of design thinking in product development, and to some extent improving efficiency in services, there has not been much research focused on design thinking in consulting.

Design can be applied to consulting in various ways depending on the objectives of the project, organizational culture of the consulting company, design maturity of the client organization and expertise and role of the consultant. A co-creation workshop can

serve as the design component, or the entire engagement could be design-led, in which case the design thinking process and its guiding principles would substantially influence consultants' work throughout the entire project (Juurikka, 2021).

In design thinking, principles are the fundamental ideas or general rules that are true regardless of the circumstances, they are the propositions that serve as the foundation for design thinking. principles considered are; Human centered design, Embrace ambiguity & diversity, Openness to radical collaboration, Co-create impactful solutions and Implement & iteratively improvise. Practices on the other hand are the tools or techniques by which the expected outcomes of the principles are achieved. Practices associated with the above principles are - Empathy maps, User personas, How Might We, Storyboarding, Interviewing techniques, Brainstorming, Business model canvas, Journey maps, Affinity diagrams, Raskar's hexagon, Morphological analysis and Value proposition canvas.

The matrix of the such principles applicable to consulting in its entirety along with associated practices, is the Design grid; the proposed conceptual framework for this research, to explore how design thinking can be applied to consulting in the information technology industry in India.

### **3.3 Research Purpose and Questions**

The purpose of the current study is to provide a comprehensive review of design thinking as applied to business and outline a conceptual framework for applying the principles and practices of design thinking to consulting in the information technology industry in India.

**Specific Aims:**

1. To understand the different types of consulting engagements and how they are executed in the Indian IT industry.
2. To understand how design thinking is generally perceived in the Indian IT industry.
3. To evaluate what design thinking principles and practices can be adopted in consulting engagements across the consulting phases, in the Indian IT industry.

The results of this study will be valuable to consulting practitioners and information technology service providers in executing engagements in a human-centric manner keeping the end customer in mind. The novelty of the research lies in design thinking discovering a new field for application, consulting services in IT industry and consulting practitioners / practices in IT can now deliver services leveraging a contemporary technique like design thinking.

The main question of the research study is to explore, evaluate and extrapolate how design thinking can be applied to consulting in the information technology industry in India.

**Sub-Questions:**

- What are the different types of consulting engagements and how are they executed in the Indian IT industry?
- How is design thinking generally perceived in the IT industry?

- What design thinking principles can be adopted in consulting engagements across the consulting phases?
- What are the design thinking practices related to the above principles and how can they be adopted in consulting engagements across the consulting phases?
- What are the potential benefits / perceived challenges of applying design thinking to consulting?

### **3.4 Research Design**

In order to integrate the many study components in an articulate and logical manner and to ensure that research problems are effectively handled, a researcher must first create a research design, which serves as the blueprint for all of the activities and the overall approach they picked. It serves as a plan for the gathering, measuring, and analysis of data (Shamsi, 2018).

Research design is the general orientation of the conduct of research, it spells out in detail the framework of the intended research and can be quantitative, qualitative or a mixture of both.

Exploratory research is the initial research into a hypothetical or theoretical area, generally carried out to determine its scalability and holds a great deal of flexibility. Exploratory research allows determining the best research design, data collection method and selection of subjects. The objective is to explore a phenomenon and gain new insights from it.

Discovering the characteristics of things, phenomena, situations, people, meanings, and events is the goal of qualitative research (Kostermans, 2019). Qualitative

research involves an in-depth understanding of the behavior and perception of a target audience concerning a particular topic, it involves case study analysis, ethnography study, or insights from interviews.

Descriptive research describes data and characteristics about the population or phenomenon being studied, attempts to explore or explain while providing additional information, builds on exploratory research. A descriptive technique used to gather data from or about individuals in order to describe, contrast, or explain their thoughts, perceptions, knowledge, values, and actions is called survey research according to Fink (2016). The objective is to describe a particular action, primarily designed to describe what is going on or what exists.

A research design is a framework for organizing and responding to research questions, such as: Why was the study conducted, how was the research problem defined, how and why was the hypothesis formed, what data was collected and what specific method was adopted, and why was a particular data analysis technique used? Research design process comprises of the following steps (Kothari, 2004):

1. State the research problem – purpose of research, context and significance of the present study. Application of design thinking in consulting in information technology in India.
2. Review related literature – study available literature to understand what is available, limitations / gaps of current research, opportunities for further research. Significant information available of application of design thinking in

products and to some extent in services, but limited research of its application in consulting.

3. Design the research study – research methods, questionnaires for data collection, determining population, sample size, criteria for participant selection. Qualitative, exploratory and descriptive research to be adopted.
4. Define data collection procedures – design questionnaire for research study, identify participants from target population, administer questionnaire through surveys with practitioners, conducting focus group discussions with experts and interviewing industry executives.
5. Analyze data collected – qualitative analysis of survey responses, findings from focus group discussions and insights from executive interviews corroborated to determine major findings.
6. Report results and recommendations – findings and results of present study along with limitations and recommendations for future research.

### **3.5 Population and Sample**

A population includes all people or items with the characteristics researcher wishes to understand or study. The population of interest for this study will be consulting practitioners, experts and executives within the information technology organizations in India. Because there is rarely enough time or money to gather information from everyone, a sample study is conducted.

Sampling is the activity that involves decisions about how to select the instances and the number of instances to select Van Aken et al. (2012). Sampling is the process of

obtaining information from a subset (sample) of a larger group (population) to estimate characteristics of the whole population. The researcher usually cannot make direct observations of every individual in the population which he / she intends to study. Instead, collects data from a subset of individuals called as sample and use these observations to make inferences about the entire population. Then the researcher makes conclusions from the sample which is probably applicable to the entire population.

There are two sampling methods - probability sampling, where each component of the population has an equal chance of being selected for the sample. Simple random sampling, systematic sampling, stratified sampling, and cluster sampling are the four methods of probability sampling. And, non-probability sampling, in which components of the population are chosen based on their availability or because the researcher believes they are representative (Shamsi, 2018).

As the population size is known, researcher has taken probability sampling and selected, 'Simple random sampling' method to draw the desired sample from the targeted population.

Population for this study (the 'N' value) is the number of consulting practitioners in the information technology space in India, is taken to be 20,000.

Confidence level is taken to be 95%. The Standard error (the 'e' Value) with 95% Confidence level is 0.05 i.e.  $(1 - 0.95)$ .

Therefore, the Standard Normal Random Variable (the 'Z' statistic) with 95% Confidence level, is constant at 1.96.

The estimates of Population proportion (the ‘P’ value), is calculated as (total favorable cases / total cases). In our target population of IT Consultants, how many are aware of design thinking, taken as 0.2.

Sample size (S) is calculated as (Verma and Verma, 2020):

$$S = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N}\right)}$$

Using the above-mentioned values, the Sample size resulted as 243.

### **3.6 Participant Selection**

Participant selection is part of designing the research study, the third step in the research design process. As the topic is fairly new in the academic literature and probably also in the corporate world, three sets of participants were selected, consultants for survey, experts for focus group discussions and industry leaders for interviews.

The first set of participants are randomly selected practitioners from the information technology industry in India with experience in consulting. A structured questionnaire designed to get practitioners response was sent to 400 randomly selected associates from the target population. The method of distribution and collection was over email and professional network platforms like LinkedIn, as it was the fastest method for data collection from a different locations perspective. A total of 252 responses were received (i.e.) a response rate of 63%. All questions in the survey were mandatory,



leaving no room for incomplete data. Therefore, all the responses have been found to be good and suitable for study.

The second set of participants are experts with a consulting capability level of proficient or more in their respective consulting type's and having a high or complete level of awareness of design thinking. Such experts who have also agreed to participate in further brainstorming sessions were invited to the focus group discussions, to co-create the Design grid for the consulting type of their expertise. In all about 8 focus group discussions were conducted with about 4 - 6 participants per session.

The third set of participants are leaders from the information technology industry in India having an insight into the topic based on their experiences with many client organizations. Letters / eMails were sent to them in advance to solicit their permission to conduct the interview. Upon receiving confirmation from the participant's willingness to participate in the study, informed consent forms were shared. Industry leaders representing industry / consulting / technology companies in India were contacted via email and LinkedIN.

Most of the people decided to take part in this study and some went further to identify other potential participants. The 'Snowball sampling method' was used to find the most suitable expert participants for this study. The number of interviews was deemed appropriate for a qualitative study in order to achieve data saturation, which occurs when new interviewees no longer contribute new knowledge and the data begins to repeat itself (Juurikka, 2021).

### **3.7 Instrumentation**

Research instruments are the tools for data collection. There are two main methods - Survey methods and non-survey methods. The survey method is one which entails direct contact between the researcher and the subject, during which the researcher asks questions which are answered by the subject. The non-survey method on the other hand is one in which data is collected about subject without necessarily asking them questions and without necessarily involving any direct contact between the researcher and the subject. The focus of this research is on the survey method of data collection. Questionnaires and interviews are the two primary types of instruments used in the survey method of data collection (Afolayan and Oniyinde, 2019).

In order to explore the research questions ‘Mixed methods methodology’ was adopted as a primary source of data, by conducting online surveys with a larger set of consulting practitioners to address generality and by conducting focus group discussions with a smaller set of experts on specific consulting types plus qualitative semi-structured interviews with a limited industry leaders to address particularity. In addition, the secondary method adopted to source data was through review of documents, academic journal articles and industry body websites. Collectively they enabled the researcher to focus beyond the literature on the problem of interest in the study and in improving validation of data, and ensuring credibility of analysis. Each instrument has its own purpose, procedures to induce results that are not possible with the other instrument. A detailed description of each instrument is provided below.

A questionnaire can simply be described as a set of written questions which are served on respondents and which are completed by them. It is a written list of questions that are answered by a number of people so that information can be collected from the answers. Questionnaire simply suggest a collection and, or a form containing a set of questions addressed to a statistically significant audience for which responses (information) are elicited for a survey. Researchers adopt this pattern when the intention is to determine the extent to which respondents hold a particular view or attitude. Questionnaires could be structured or unstructured. An organized and planned structure is used to create a structured questionnaire. In this category, questions might be closed-ended or open-ended. Conversely, unstructured surveys are more comparable to an interview guide (Afolayan and Oniyinde, 2019).

The response format of the questionnaire is a major design consideration since this will alter the type and wording of the questions as well as focus on the type of analysis that the researcher wants to perform. For our research ‘Close-ended question’ format was considered since the data would be in a quantifiable form ensuring that statistical analysis can be performed. Moreover, it is fast and easy to complete, enables automated data entry, and facilitates data analysis and summary of data. The rating scale (Likert scale) and ranking used within this format is to obtain the answers from the respondents. The Likert scale used provide a more precise measure than yes/no or true/false items and it is fast and easy to complete. The rating system utilized for the questions enables the respondents to express the relative importance of selections, assisting the researchers in determining the important issues or aspects (Shamsi, 2018).

Focus group discussion is a form of qualitative research method in which the interviewer (also called the moderator) asks research participants specific questions about a topic or an issue in a group discussion. Focus groups, unlike individual interviews, provide the added dimension of the interactions among members. The interaction between group members should be prioritized when conducting the focus group. The group members are urged to converse with one another, exchanging thoughts and remarks on each other's experiences or points of view, as opposed to the moderator asking questions (Wong, 2008).

Interviews consist of collecting data by asking question. It is a research method that involves the researcher asking questions and hopefully receiving answers from the respondents. It is an interaction in which oral questions are posed by the interviewer to elicit response from the interviewee. The participants, that is, the interviewer and the respondents are strangers. Thus, the investigator has to get himself introduced to the respondent in an appropriate manner. Interview is not a mere casual conversational exchange, but a conversation with a specific purpose. The purpose of research interview is to explore the views, experience, beliefs of the individual participant on the information chosen, to listen attentively to what the respondents have to say, in order to acquire more knowledge about the study topic. It is imperative to ask questions that are likely to yield as much information about the study topic when carrying out interviews. It is usually best to start with questions that the participant can answer easily and then proceed to more difficult and sensitive topics. There are three major types of interviews -

Fully-structured interview, Semi-structured interview and Unstructured interview. For the purpose of this research ‘Semi-unstructured interviews’ have been adopted.

Although the questions in this form of interview are set, the interviewer may change the language at their discretion, particularly if the questions seem to be improper for a particular interviewee. The duration of the interview varies according to the participant, researcher, and subject matter. The interview may last 20 to 60 minutes on average (Afolayan and Oniyinde, 2019).

### **3.8 Data Collection Procedures**

Data collection is the systematic approach to gathering and measuring information from a variety of sources to get a complete and accurate picture of a subject under study. Data collection enables a researcher or an organization to answer relevant questions related to topic, evaluate outcomes and make predictions about future probabilities and trends. Basically, there are two types of sources of data collection:

Primary Source - primary data is information collected through original or first-hand research. It is real time data which are collected by the researcher himself specifically to address the research problem. Important primary sources for this research are online questionnaire and personal interviews.

Secondary Source - the data which is collected from some secondary source (i.e.) the source of reservation storage where the data is collected by one person and used by other agency. These are collected as primary data and used by others as secondary data. The researcher has referred to a number of various literary resources both in published and electronic media for preparing the review of literature (Shamsi, 2018).

The researcher has collected both primary and secondary data for this study. Secondary data was collected from the secondary sources like books, journals and internet. Primary data was collected by using questionnaire, answered through survey questions sent to practitioners and semi-structured interviews with executives. The questions explored relevancy of different design thinking principles and practices relationship to consulting.

The survey had structured questions, closed-ended and Likert-type questions and provided objective quantifiable data on the subject and includes participant's demographic data. The survey was administered using Google Forms, respondents were sought through social media platforms like LinkedIn and emails to personal and professional contacts.

The 'Survey – Questionnaire' (refer to Appendix B) was designed based on the literature review as well as the conceptual framework, to obtain preliminary observations of participants perspective of the subject. The questionnaire comprises of five parts. The first part of the questionnaire is intended to get some profile of participants – name, email, education, overall experience and consulting experience. The second part of the questionnaire is focused on consulting expertise across the specific consulting types. The third part is to identify, awareness of design thinking. Part four, focused on design thinking principles, applicability to consulting phases and consulting types. In part five, the focus is on design thinking practices - applicability to consulting phases, consulting types and relation to design thinking principles.

Focus group discussions are conducted to understand how people think and feel. A good focus group has the following characteristics: carefully recruited participants, interacting in a comfortable environment, led by a skillful moderator, followed by systematic analysis and reporting. Focus group interviews are not meant to be used as, a process for getting people to come to consensus or a way to teach / test knowledge or skills (Krueger and Casey, 2002).

The 'Focus Group Discussion – Process' (refer to Appendix C) will be held for each consulting type, with about experts having a consulting capability of proficient or higher in the respective consulting type and have agreed to participate. Focus group discussions were conducted separately for each consulting type. Only participants with high or complete awareness of design thinking are selected for the focus group discussions. In each session, the Design grid was populated for the specific consulting type selecting one relevant principle and two practices related to the selected principle, this was repeated for each consulting phase, through moderated discussions.

For this study purpose, it was also intended to conduct one-on-one semi-structured interviews with a limited set of industry leaders. A semi-structured interview guides the conversation of an in-depth interview towards topics of interest, but leaves sufficient room for additional information. It involves systematically preparing questions including probes to elicit more elaborate responses (Legard et al., 2003; Dumay, 2011; Van Aken et al., 2012).

Interviews allow the researcher to gather the industry leader's knowledge and experiences. Moreover, the one-on-one interview is essential in that it assists in

establishing rapport with the interviewee and gets the support needed to obtain accurate data for validation. In general, the following process was adopted for interviews – permission was obtained from interviewees via email, participants were requested to sign an ‘Executive Interview - Informed Consent’ (refer to Appendix E).

After a brief introduction of each other and an explanation of the study details with the participant, a set of open-ended questions as in ‘Executive Interview – Guide’ (refer to Appendix F) were used to get executive opinion on survey findings and feedback on the design grids co-created in focus group discussions. In addition, industry leaders own insights on application for design thinking in consulting from a strategic, tactical and operational perspectives were captured.

### **3.9 Data Analysis**

The objective of data analysis is to reduce the accumulated data to a manageable size, develop summaries of the data, look for patterns, and apply statistical techniques in order for researchers to specify the conditions under which their conclusions are valid. The intention is to get a feel for the data, test the goodness of the data and verify the hypotheses developed for the research.

Qualitative data analysis could heavily rely on interpretation and the researcher’s own experiences and knowledge of the field as the data could be rich and complex. Therefore, to ensure that the analysis of qualitative data will be meaningful and valuable, it is crucial to build a systematic method and make a plan in advance. The method is carried out in five main steps (Taylor-Powell, 2004):



1. Get to know your data – good analysis depends on understanding the data. For qualitative analysis, this means you read and re-read the text. Write down impressions you have as you go through the data. Consider the quality of data and proceed accordingly. Explain the limitations and level of analysis you deem appropriate given your data.
2. Focus on the analysis – review the purpose of your evaluation and what you want to find out. Focus by question, look at how individuals responded to a particular question or topic. Organize the data by question to look at all respondents and their answers in order to identify consistencies and differences. Later you may explore the connections and relationships between questions.
3. Categorize information – referred to as coding the data or indexing the data. To bring meaning to the data, identify themes or patterns and organize them into coherent categories, involves reading and re-reading the text. As you categorize the data, you might identify other themes that serve as sub-categories.
4. Identify patterns and connections within and between categories – assessing the relative importance of different themes or highlighting subtle variations maybe important to your analysis. Summarizing information pertaining to one theme or capturing the similarities or differences in people’s responses within a category. Creating larger categories that combine several categories.

Relative importance, to show which categories which appear more important or a greater number of times. Identify relationships between categories.

5. Interpretation – bringing it all together to explain your findings, attaching meaning and significance to the analysis. A visual display might help communicate the findings. Such a model may also reveal gaps in your investigation and connections that remain unclear, these maybe areas you can suggest further study.

The data collected from the surveys was transferred to Microsoft Excel for statistical analysis. The data collected from interview recordings and handwritten notes was transcribed either manually or through suitable transcribing software and imputed in Microsoft Excel spreadsheets for further analysis. Then, thematic analysis using abductive approach was used to identify, analyze and report themes within the data. The content analysis was used to examine the keyword frequencies, common phrases and related keywords were used to create categories and identify recurrent themes. It was used to derive the conclusions and valuable insights.

### **3.10 Research Design Limitations**

Qualitative research is not concerned with numerical representativity, but with the deepening of understanding a given problem. In qualitative research, the researcher is both the subject and the object of his research. The goal of the qualitative methodology is to generate in-depth and illustrative data in order to comprehend the numerous facets of the subject being studied (Queiros et al., 2017).

Limitations of any particular study concern potential weaknesses that are usually out of the researcher's control, and are closely associated with the chosen research design, statistical model constraints, funding constraints, or other factors. In this sense, a constraint is a "imposed" one that is virtually outside the researcher's control. Even so, since it might have an impact on the study's design, findings, and ultimately, conclusions, it must be fully stated in the report when it is submitted (Theofanidis and Fountouki, 2018).

The researcher made some assumptions when developing and analyzing the research design. The researcher assumed, that the small sample population represents the consulting practitioners in the information technology industry in India, that they responded to the survey honestly, that the research participants would have appropriate knowledge of design thinking and its applications, that the consulting experts collaborated freely in co-creating the design grids and that the interviewees shared their experiences and insights openly without hesitation.

### **3.11 Conclusion**

This chapter described the researcher's approach for conducting the research study. The chapter provided details of the research design process, population of interest and computation of sample size. Participant selection - randomly selected consulting practitioners from the information technology industry in India for survey, experts for focus group discussions and industry leaders for semi-structured interviews. The chapter also detailed the questionnaire, which comprises of five parts – participant profile, consulting capability, design thinking awareness, design thinking principles and design

thinking practices. Semi-unstructured interviews have been adopted. Primary data was collected by using questionnaire, survey was administered using Google Forms, respondents were sought through social media platforms like LinkedIn and emails to personal and professional contacts. Data collected from survey and focus group discussions will be highlighted in the next chapter on Results.

## CHAPTER IV: RESULTS

### **4.1 Introduction**

The Methodology chapter described the researcher's approach for conducting the research study. Research instruments used for data collection included, survey of consulting practitioners in the Indian IT industry, focus group discussions with practitioners proficient or expert in specific consulting types with high or complete awareness of design thinking, and semi-structured interviews with IT industry leaders to validate findings from survey, observations from focus group discussions and also to get their independent insights on the subject.

In this chapter, results from the research are presented, starting with profile of participants. Results specific to the research subject are presented along the following themes:

Theme 1: Consulting capability

Theme 2: Design thinking awareness

Theme 3: Design thinking principles

Theme 4: Design thinking practices

Theme 5: Design thinking in consulting.

The first four themes are results from the survey. The fifth theme is results from focus group discussions.

## 4.2 Results of Survey

Themes covered in the survey are – participant profile, consulting capability, design thinking awareness, design thinking principles and design thinking practices.

### 4.2.1 Participant Profile

Participants to the research survey were randomly selected practitioners from the information technology in India with experience in consulting. Practitioners were profiled in Part 1 of the survey, demographic details collected are:

1. Education - graduate, post-graduate or doctorate
2. Total work experience in five year slabs from <5 to >20, and
3. Of the total work experience, their respective consulting experience, also in five year slabs from <5 to >20.

#### 4.2.1.1 Education

A good majority of the survey respondents 73% are post-graduates and about 19% being graduates, remaining 8% have a doctoral degree.

*Table 4.1  
Participants Education Distribution*

<b>Graduate</b>	<b>Post-graduate</b>	<b>Doctorate</b>
19%	73%	8%

#### 4.2.1.2 Education

In terms of experience, a vast majority 78% have work experience of over 20 years, next being 13% of respondents with over 16 years of experience.

*Table 4.2  
Participants Total Experience Distribution*

<b>&lt;5</b>	<b>6 – 10</b>	<b>11 – 15</b>	<b>16 – 20</b>	<b>&gt;20</b>
0%	4%	5%	13%	78%

#### 4.2.1.3 Consulting Experience

Consulting experience however, was evenly distributed. Respondents with over 20 years of consulting experience still being the highest at 26%.

*Table 4.3  
Participants Consulting Experience Distribution*

<b>&lt;5</b>	<b>6 – 10</b>	<b>11 – 15</b>	<b>16 – 20</b>	<b>&gt;20</b>
13%	24%	20%	17%	26%

#### 4.2.2 Consulting Capability

Respondents were asked to indicate their consulting capability ranging from Novice to Beginner, Competent, Proficient and Expert across the eight consulting types - IT Strategy consulting, IT Architecture consulting, IT Portfolio management, IT Process consulting, IT Governance consulting, IT Infrastructure consulting, IT Outsourcing consulting and IT Transformation consulting.

*Table 4.4*  
*Consulting Capability Distribution*

<b>Consulting type</b>	<b>Novice</b>	<b>Beginner</b>	<b>Competent</b>	<b>Proficient</b>	<b>Expert</b>
IT Strategy consulting	6%	12%	33%	23%	26%
IT Architecture consulting	15%	21%	32%	15%	17%
IT Portfolio management	14%	17%	34%	22%	13%
IT Process consulting	8%	13%	45%	15%	19%
IT Governance consulting	16%	15%	37%	17%	15%
IT Infrastructure consulting	30%	29%	23%	12%	6%
IT Outsourcing consulting	13%	14%	35%	19%	19%
IT Transformation consulting	6%	10%	29%	30%	25%

Consulting capability, when asked for across five levels of proficiency, yielded different results for different consulting types.

#### **4.2.3 Design Thinking Awareness**

Respondents were asked to indicate their degree of familiarity of design thinking ranging from Lack of awareness to Low level of awareness, Medium level of awareness, High level of awareness and Complete awareness.



*Table 4.5*  
*Design Thinking Awareness Distribution*

<b>Lack of awareness</b>	<b>Low level of awareness</b>	<b>Medium level of awareness</b>	<b>High level of awareness</b>	<b>Complete awareness</b>
2%	7%	40%	37%	14%

Awareness of design thinking, stood highest at Medium level of awareness at 40%, followed by High level of awareness and Complete awareness.

#### **4.2.4 Design Thinking Principles**

Each of the design thinking principle has been assigned a unique ID that will be used in discussions in quotes (refer Table 4.6).

*Table 4.6*  
*Design Thinking Principles*

<b>Unique ID</b>	<b>Design thinking principle</b>
PRI-01	Human centered design
PRI-02	Embrace ambiguity & diversity
PRI-03	Openness to radical collaboration
PRI-04	Co-create impactful solutions
PRI-05	Implement & iteratively improvise

Respondents were asked to indicate applicability of design thinking principles to consulting phases and also to consulting types separately.

*Table 4.7  
Design Thinking Principles Applicability to Consulting Phases*

<b>Design thinking principle</b>	<b>Consulting phase</b>	Understanding context	Current state assessment	Target state definition	Analysis & findings	Report & recommendations
PRI-01 Human centered design		75	66	73	48	54
PRI-02 Embrace ambiguity & diversity		64	62	62	57	36
PRI-03 Openness to radical collaboration		53	51	74	61	52
PRI-04 Co-create impactful Solutions		38	33	79	70	72
PRI-05 Implement & iteratively improvise		28	36	65	71	78

The five design thinking principles, in co-relation to the five consulting phases yielded a mixed set of responses. Focus group discussions post survey, provided more clarity on the applicability.

Table 4.8  
*Design Thinking Principles Applicability to Consulting Types*

<b>Consulting type</b>	<b>IT Strategy consulting</b>	<b>IT Architecture consulting</b>	<b>IT Portfolio management</b>	<b>IT Process consulting</b>	<b>IT Governance consulting</b>	<b>IT Infrastructure consulting</b>	<b>IT Outsourcing consulting</b>	<b>IT Transformation consulting</b>
<b>Design thinking principle</b>								
PRI-01 Human centered design	65	49	33	72	55	27	43	61
PRI-02 Embrace ambiguity & diversity	72	45	45	54	59	31	40	59
PRI-03 Openness to radical collaboration	67	52	46	58	51	38	43	58
PRI-04 Co-create impactful solutions	68	68	42	63	45	52	45	59
PRI-05 Implement & iteratively improvise	61	64	43	64	44	50	43	58

The five design thinking principles, in co-relation to the eight consulting types yielded a mixed set of responses. Focus group discussions post survey, provided more clarity on the applicability.

#### 4.2.5 Design Thinking Practices

Each of the design thinking practice has been assigned a unique ID that will be used in discussions in quotes (refer Table 4.9).

*Table 4.9  
Design Thinking Practices*

<b>Unique ID</b>	<b>Design thinking Practice</b>	<b>Unique ID</b>	<b>Design thinking Practice</b>
PRA-01	Empathy maps	PRA-07	Business model canvas
PRA-02	User personas	PRA-08	Journey maps
PRA-03	How might we	PRA-09	Affinity diagrams
PRA-04	Storyboarding	PRA-10	Raskar's hexagon
PRA-05	Interviewing techniques	PRA-11	Morphological analysis
PRA-06	Brainstorming	PRA-12	Value proposition canvas

Respondents were asked to indicate applicability of design thinking practices to consulting phases and also to consulting types separately.

*Table 4.10  
Design Thinking Practices Applicability to Consulting Phases*

<b>Design thinking practice</b>	<b>Consulting phase</b>				
	Understanding context	Current state assessment	Target state definition	Analysis & findings	Report & recommendations
PRA-01 Empathy maps	83	68	40	41	21
PRA-02 User personas	75	75	70	46	28
PRA-03 How might we	41	41	83	61	38
PRA-04 Storyboarding	47	56	74	58	41
PRA-05 Interviewing techniques	80	78	40	32	19
PRA-06 Brainstorming	45	48	78	67	37
PRA-07 Business model canvas	44	55	72	61	57
PRA-08 Journey maps	46	67	73	54	43
PRA-09 Affinity diagrams	47	58	57	59	32
PRA-10 Raskar's hexagon	36	34	64	68	33
PRA-11 Morphological analysis	25	31	61	67	35
PRA-12 Value proposition canvas	32	35	72	68	69

The 12 design thinking practices, in co-relation to the five consulting phases yielded a mixed set of responses. Focus group discussions post survey, provided more clarity on the applicability.

*Table 4.11  
Design Thinking Practices Applicability to Consulting Types*

<b>Design thinking practice</b>	<b>IT Strategy consulting</b>	<b>IT Architecture consulting</b>	<b>IT Portfolio management</b>	<b>IT Process consulting</b>	<b>IT Governance consulting</b>	<b>IT Infrastructure consulting</b>	<b>IT Outsourcing consulting</b>	<b>IT Transformation consulting</b>
PRA-01 Empathy maps	65	40	32	64	45	22	34	63
PRA-02 User personas	59	50	40	63	48	31	37	57
PRA-03 How might we	66	56	51	61	47	42	33	52
PRA-04 Storyboarding	67	56	46	67	40	34	35	54
PRA-05 Interviewing techniques	75	59	51	72	64	44	48	57
PRA-06 Brainstorming	73	62	57	65	47	47	38	56
PRA-07 Business model canvas	71	55	48	49	47	28	36	57
PRA-08 Journey maps	70	57	43	65	41	27	33	54

<b>Design thinking practice</b>	<b>IT Strategy consulting</b>	<b>IT Architecture consulting</b>	<b>IT Portfolio management</b>	<b>IT Process consulting</b>	<b>IT Governance consulting</b>	<b>IT Infrastructure consulting</b>	<b>IT Outsourcing consulting</b>	<b>IT Transformation consulting</b>
PRA-09 Affinity diagrams	65	53	46	52	38	21	31	48
PRA-10 Raskar's hexagon	60	49	42	49	32	26	33	43
PRA-11 Morphological analysis	63	52	41	50	30	34	31	49
PRA-12 Value proposition canvas	77	59	48	56	44	45	43	57

The 12 design thinking practices, in co-relation to the eight consulting types yielded a mixed set of responses. Focus group discussions post survey, provided more clarity on the applicability.

#### **4.3 Results of Focus Group Discussions**

As part of the survey respondents were also asked for their willingness to participate in focus group discussions to explore application of design thinking in consulting, 54% of respondents agreed to participate (refer Table 4.12).

*Table 4.12  
Participation in Focus Group Discussions*

<b>Willingness to participate in Focus Group Discussions</b>	<b>Yes</b>	<b>No</b>
	54	46

Participants to focus group discussions were selected based on the following criteria – should have agreed to participate in the brainstorming sessions in the survey form, should have a high or complete awareness of design thinking and should have consulting capability level of proficient or expert in the specific consulting type. Respondents meeting these criteria have been invited to focus group discussion to brainstorm on Design grid for design thinking in consulting for each consulting type.

Moderated by the research scholar, each focus group discussion consisting of 4 – 6 participants, spent about 45 minutes and adhered to the following steps:

1. Select one design thinking principle that is most relevant in your opinion for the specific consulting type for Understanding context.
2. Select two design thinking practices that are most related to the chosen design thinking principle and relevant to the specific consulting type for Understanding context.
3. Repeat Step 1 and Step 2 for Current state assessment, Target state definition, Analysis & findings and Report & recommendations to arrive at the complete Design grid.



### 4.3.1 Design Grid for Design Thinking in IT Strategy Consulting

Results summarized in Table 4.13. Please refer to Appendix D for details of focus group discussion.

*Table 4.13  
Focus Group Discussion – IT Strategy Consulting Design Grid*

<b>Design thinking principle</b>	<b>Design thinking practice</b>	<b>PRI-01 Human centered design</b>	<b>PRI-02 Embrace ambiguity &amp; diversity</b>	<b>PRI-03 Openness to radical collaboration</b>	<b>PRI-04 Co-create impactful solutions</b>	<b>PRI-05 Implement &amp; iteratively improvise</b>
PRA-01 Empathy maps		UC	UC	UC		
PRA-02 User personas		UC				
PRA-03 How might we		TSD	TSD			
PRA-04 Storyboarding		TSD	CSA TSD	CSA		R&R
PRA-05 Interviewing techniques			UC CSA	UC CSA		
PRA-06 Brainstorming				A&F	A&F	
PRA-07 Business model canvas			TSD			
PRA-08 Journey maps			CSA		R&R	R&R
PRA-09 Affinity diagrams				A&F	A&F	
PRA-10 Raskar's hexagon					A&F	
PRA-11 Morphological analysis					A&F	
PRA-12 Value proposition canvas					R&R	R&R

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.

### 4.3.2 Design Grid for Design Thinking in IT Architecture Consulting

Results summarized in Table 4.14. Please refer to Appendix D for details of focus group discussion.

*Table 4.14  
Focus Group Discussion – IT Architecture Consulting Design Grid*

<b>Design thinking principle</b>	<b>Design thinking practice</b>	<b>PRI-01 Human centered design</b>	<b>PRI-02 Embrace ambiguity &amp; diversity</b>	<b>PRI-03 Openness to radical collaboration</b>	<b>PRI-04 Co-create impactful solutions</b>	<b>PRI-05 Implement &amp; iteratively improvise</b>
PRA-01 Empathy maps	TSD					
PRA-02 User personas	TSD	UC				
PRA-03 How might we	TSD	UC				
PRA-04 Storyboarding		UC CSA		UC	R&R	
PRA-05 Interviewing techniques		UC CSA				
PRA-06 Brainstorming				A&F		
PRA-07 Business model canvas		UC CSA	CSA TSD		R&R	
PRA-08 Journey maps	TSD	UC	CSA TSD		R&R	
PRA-09 Affinity diagrams	TSD					
PRA-10 Raskar's hexagon	TSD	A&F				
PRA-11 Morphological analysis		A&F		A&F		
PRA-12 Value proposition canvas			R&R		R&R	

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.

### 4.3.3 Design Grid for Design Thinking in IT Portfolio Management

Results summarized in Table 4.15. Please refer to Appendix D for details of focus group discussion.

*Table 4.15  
Focus Group Discussion – IT Portfolio Management Design Grid*

<b>Design thinking principle</b>	<b>PRI-01 Human centered design</b>	<b>PRI-02 Embrace ambiguity &amp; diversity</b>	<b>PRI-03 Openness to radical collaboration</b>	<b>PRI-04 Co-create impactful solutions</b>	<b>PRI-05 Implement &amp; iteratively improvise</b>
<b>Design thinking practice</b>					
PRA-01 Empathy maps	UC	UC			
PRA-02 User personas	UC	UC			
PRA-03 How might we		A&F		TSD	
PRA-04 Storyboarding					
PRA-05 Interviewing techniques	CSA				
PRA-06 Brainstorming		A&F	A&F		TSD
PRA-07 Business model canvas	UC	CSA		TSD	TSD R&R
PRA-08 Journey maps	CSA R&R			R&R	
PRA-09 Affinity diagrams		CSA	A&F		
PRA-10 Raskar’s hexagon				TSD	
PRA-11 Morphological analysis				TSD	

<b>Design thinking principle</b>	<b>PRI-01 Human centered design</b>	<b>PRI-02 Embrace ambiguity &amp; diversity</b>	<b>PRI-03 Openness to radical collaboration</b>	<b>PRI-04 Co-create impactful solutions</b>	<b>PRI-05 Implement &amp; iteratively improvise</b>
<b>Design thinking practice</b>					
PRA-12 Value proposition canvas	R&R			R&R	R&R

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.

#### 4.3.4 Design Grid for Design Thinking in IT Process Consulting

Results summarized in Table 4.16. Please refer to Appendix D for details of focus group discussion.

*Table 4.16  
Focus Group Discussion – IT Process Consulting Design Grid*

<b>Design thinking principle</b>	<b>PRI-01 Human centered design</b>	<b>PRI-02 Embrace ambiguity &amp; diversity</b>	<b>PRI-03 Openness to radical collaboration</b>	<b>PRI-04 Co-create impactful solutions</b>	<b>PRI-05 Implement &amp; iteratively improvise</b>
<b>Design thinking practice</b>					
PRA-01 Empathy maps	UC CSA TSD		UC A&F		
PRA-02 User personas	UC CSA	CSA	A&F		
PRA-03 How might we			TSD	TSD	

<b>Design thinking principle</b>	<b>Design thinking practice</b>	PRI-01 Human centered design	PRI-02 Embrace ambiguity & diversity	PRI-03 Openness to radical collaboration	PRI-04 Co-create impactful solutions	PRI-05 Implement & iteratively improvise
PRA-04 Storyboarding					TSD	
PRA-05 Interviewing techniques	UC	CSA	A&F			
PRA-06 Brainstorming		UC	A&F	TSD	R&R	
PRA-07 Business model canvas		CSA		TSD R&R	R&R	
PRA-08 Journey maps	UC	CSA	UC A&F			
PRA-09 Affinity diagrams		UC CSA	A&F	A&F		
PRA-10 Raskar's hexagon			TSD		R&R	
PRA-11 Morphological analysis				A&F		
PRA-12 Value proposition canvas				R&R	R&R	

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.

### 4.3.5 Design Grid for Design Thinking in IT Governance Consulting

Results summarized in Table 4.17. Please refer to Appendix D for details of focus group discussion.

Table 4.17

Focus Group Discussion – IT Governance Consulting Design Grid

<b>Design thinking principle</b>	<b>Design thinking practice</b>	PRI-01 Human centered design	PRI-02 Embrace ambiguity & diversity	PRI-03 Openness to radical collaboration	PRI-04 Co-create impactful solutions	PRI-05 Implement & iteratively improvise
PRA-01 Empathy maps	UC TSD					
PRA-02 User personas	UC CSA TSD					
PRA-03 How might we						
PRA-04 Storyboarding			CSA		TSD	R&R
PRA-05 Interviewing techniques	UC CSA		CSA			
PRA-06 Brainstorming					A&F	
PRA-07 Business model canvas	TSD A&F		A&F		TSD	R&R
PRA-08 Journey maps	TSD A&F		CSA		A&F	
PRA-09 Affinity diagrams	CSA					
PRA-10 Raskar's hexagon	TSD		A&F			

<b>Design thinking principle</b>	<b>Design thinking practice</b>	PRI-01 Human centered design	PRI-02 Embrace ambiguity & diversity	PRI-03 Openness to radical collaboration	PRI-04 Co-create impactful solutions	PRI-05 Implement & iteratively improvise
PRA-11 Morphological analysis	R&R					
PRA-12 Value proposition canvas	R&R					R&R

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.

#### 4.3.6 Design Grid for Design Thinking in IT Infrastructure Consulting

Results summarized in Table 4.18. Please refer to Appendix D for details of focus group discussion.

*Table 4.18  
Focus Group Discussion – IT Infrastructure Consulting Design Grid*

<b>Design thinking principle</b>	<b>Design thinking practice</b>	PRI-01 Human centered design	PRI-02 Embrace ambiguity & diversity	PRI-03 Openness to radical collaboration	PRI-04 Co-create impactful solutions	PRI-05 Implement & iteratively improvise
PRA-01 Empathy maps	TSD	UC				
PRA-02 User personas	TSD	UC				
PRA-03 How might we			CSA	A&F		
PRA-04 Storyboarding	TSD	CSA	UC CSA			R&R

<b>Design thinking principle</b>	<b>Design thinking practice</b>	<b>PRI-01 Human centered design</b>	<b>PRI-02 Embrace ambiguity &amp; diversity</b>	<b>PRI-03 Openness to radical collaboration</b>	<b>PRI-04 Co-create impactful solutions</b>	<b>PRI-05 Implement &amp; iteratively improvise</b>
	PRA-05 Interviewing techniques			UC CSA		
	PRA-06 Brainstorming		UC		A&F	
	PRA-07 Business model canvas	TSD	UC			
	PRA-08 Journey maps	TSD	UC		A&F	R&R
	PRA-09 Affinity diagrams					
	PRA-10 Raskar's hexagon					
	PRA-11 Morphological analysis					
	PRA-12 Value proposition canvas					R&R

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.



### 4.3.7 Design Grid for Design Thinking in IT Outsourcing Consulting

Results summarized in Table 4.19. Please refer to Appendix D for details of focus group discussion.

Table 4.19  
Focus Group Discussion – IT Outsourcing Consulting Design Grid

<b>Design thinking principle</b>	<b>Design thinking practice</b>	<b>PRI-01 Human centered design</b>	<b>PRI-02 Embrace ambiguity &amp; diversity</b>	<b>PRI-03 Openness to radical collaboration</b>	<b>PRI-04 Co-create impactful solutions</b>	<b>PRI-05 Implement &amp; iteratively improvise</b>
	PRA-01 Empathy maps		UC			
	PRA-02 User personas	UC	UC			
	PRA-03 How might we	TSD	UC			
	PRA-04 Storyboarding			CSA		R&R
	PRA-05 Interviewing techniques			CSA		
	PRA-06 Brainstorming	TSD			A&F	
	PRA-07 Business model canvas	TSD		CSA		R&R
	PRA-08 Journey maps	TSD		CSA	A&F	
	PRA-09 Affinity diagrams			A&F	A&F	
	PRA-10 Raskar's hexagon					
	PRA-11 Morphological analysis			TSD	A&F	
	PRA-12 Value proposition canvas					R&R

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.

### 4.3.8 Design Grid for Design Thinking in IT Transformation Consulting

Results summarized in Table 4.20. Please refer to Appendix D for details of focus group discussion.

*Table 4.20  
Focus Group Discussion – IT Transformation Consulting Design Grid*

<b>Design thinking principle</b>	<b>Design thinking practice</b>	<b>PRI-01 Human centered design</b>	<b>PRI-02 Embrace ambiguity &amp; diversity</b>	<b>PRI-03 Openness to radical collaboration</b>	<b>PRI-04 Co-create impactful solutions</b>	<b>PRI-05 Implement &amp; iteratively improvise</b>
PRA-01 Empathy maps	UC CSA	UC				
PRA-02 User personas	UC	UC CSA				
PRA-03 How might we	CSA TSD					
PRA-04 Storyboarding			CSA	TSD	R&R	
PRA-05 Interviewing techniques		UC CSA	CSA A&F			
PRA-06 Brainstorming			TSD	TSD A&F	R&R	
PRA-07 Business model canvas	TSD		TSD		R&R	
PRA-08 Journey maps				A&F		
PRA-09 Affinity diagrams			A&F	A&F	R&R	
PRA-10 Raskar's hexagon						
PRA-11 Morphological analysis				A&F		

<b>Design thinking principle</b>					
<b>Design thinking practice</b>	PRI-01 Human centered design	PRI-02 Embrace ambiguity & diversity	PRI-03 Openness to radical collaboration	PRI-04 Co-create impactful solutions	PRI-05 Implement & iteratively improvise
PRA-12 Value proposition canvas					R&R

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.

#### 4.4 Results of Executive Interviews

Select leaders from Indian IT industry, were invited for interviews to gain their insights on the research subject, to playback findings from survey, focus group discussions and seek their expert opinion. Leaders representing industry / consulting / technology were interviewed and each interview lasted for about an hour.

The interview process comprised of the following steps:

- A. Introductions
- B. Briefing on the research study and methodology adopted
- C. Explanation of survey questionnaire and format of focus group discussions
- D. Elaboration on findings from survey and focus group discussions
- E. Interview executives to gain their insights on design thinking, design thinking principles relevance to consulting phases / types, design thinking practices relation to design thinking principles / consulting phases / types and opinions on Design grid for each consulting type.

Results of industry leader interviews are best understand post analysis of findings from survey, focus group discussions and are therefore detailed in the following chapter.

#### **4.5 Conclusion**

This chapter presented the results from survey and focus group discussions only. Firstly, the profile of participants and then the subject specific data along consulting capability, design thinking awareness, design thinking principles and design thinking practice themes, all of which are from the survey. Design thinking in consulting theme data was from focus group discussions. Interviews with industry leaders were conducted post-completion of analysis of survey and focus group discussion proceedings. Data from the survey have been transferred to Microsoft excel for quantitative analysis. Focus group discussion proceedings will remain in Microsoft word as the analysis is pre-dominantly qualitative, except in cases where there was no clear choice of a design thinking principle or practices, the researcher relied on survey data. Findings from analysis of all the above themes will be highlighted in the next chapter on Discussion.

## CHAPTER V: DISCUSSION

### **5.1 Introduction**

The Results chapter, presented responses from the survey of consulting practitioners in the Indian IT industry and proceedings from focus group discussions conducted with practitioners proficient or expert in specific consulting types with high or complete awareness of design thinking.

In this chapter, discussion of results from the research are presented, starting with profile of participants. Discussion of results specific to the research subject are presented along the following themes:

Theme 1: Consulting capability

Theme 2: Design thinking awareness

Theme 3: Design thinking principles

Theme 4: Design thinking practices

Theme 5: Design thinking in consulting.

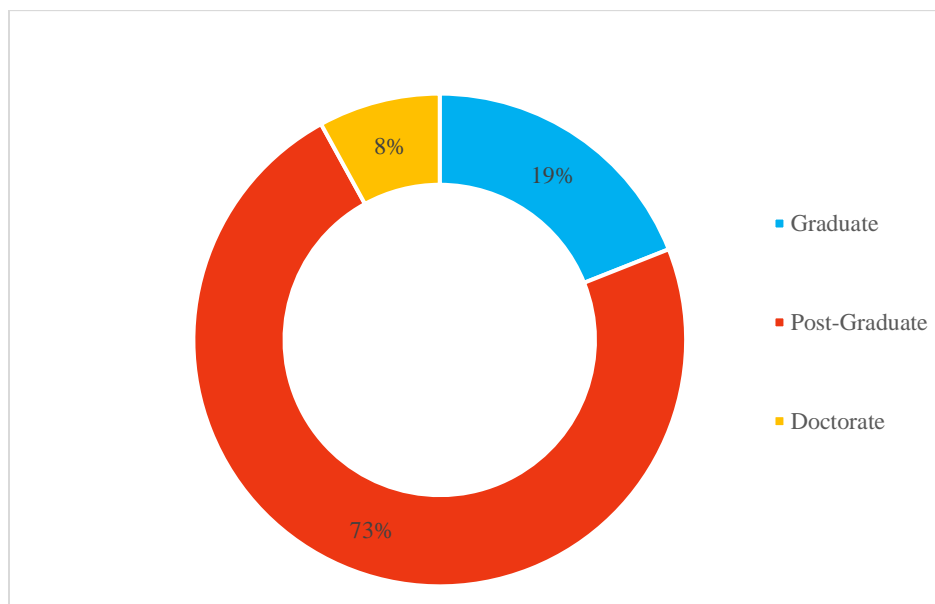
The first four themes are results from the survey. The fifth theme is results from focus group discussions. Summary results from the five themes have been discussed with industry leaders as part of executive interviews; executive feedback plus their independent insights on applicability of design thinking to consulting are also presented in this chapter.

## 5.2 Discussion on Findings from Survey

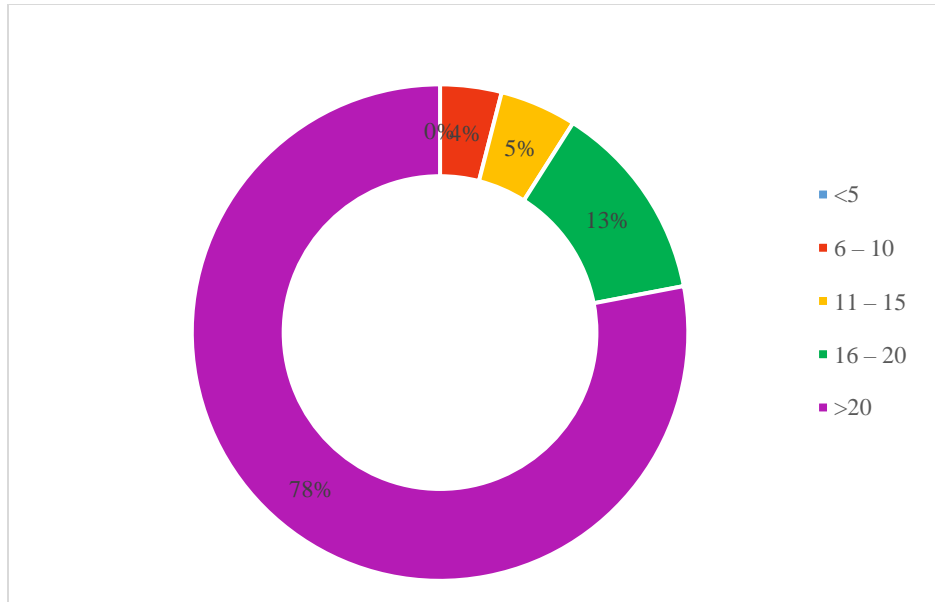
Discussion on findings from survey, continues on the same themes – participant profile, consulting capability, design thinking awareness, applicability of design thinking principles and design thinking practices to consulting phases and consulting types.

### 5.2.1 Participant Profile

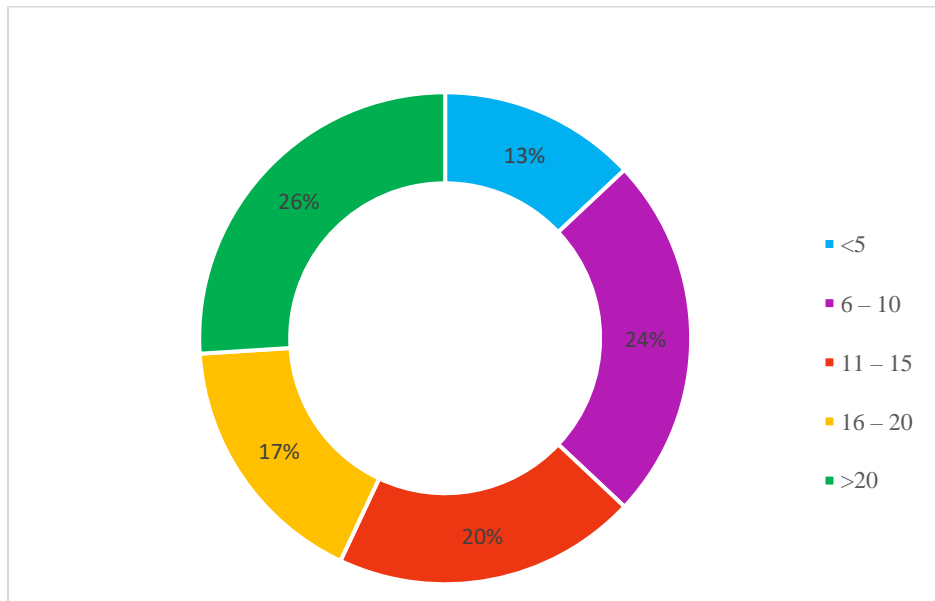
Participant details analyzed from the survey are - education, total work experience and consulting experience.



*Figure 5.1*  
*Participant Profile – Education*



*Figure 5.2  
Participant Profile – Total Experience*



*Figure 5.3  
Participant Profile – Consulting Experience*

In terms of education, more than 80% of the respondents, have a post-graduate or higher degree (73% with post-graduation, 8% with a doctorate degree). On the experience front also, 80% plus respondents have more than 15 years of working experience (78% with over 20 years of experience and 13% with over 15 years of experience). Consulting experience however, was evenly distributed. Over 50% of the respondents have over 10 years of consulting experience (26% over 20 years of experience, 17% over 15 years of experience and another 20% with over 10 years of consulting experience). Collectively, this indicates a participant profile, rich in education, experience and consulting.

### 5.2.2 Consulting Capability

Consulting capability ranked on a five point scale, ranging from Novice to Beginner, Competent, Proficient and Expert (see Figure 5.4).

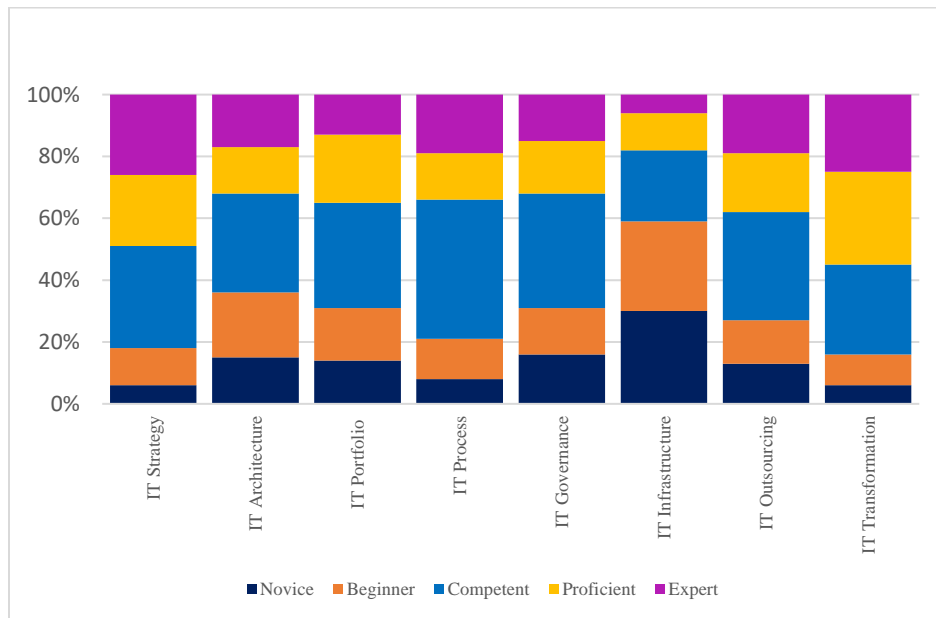


Figure 5.4  
Consulting Capability across Consulting Types

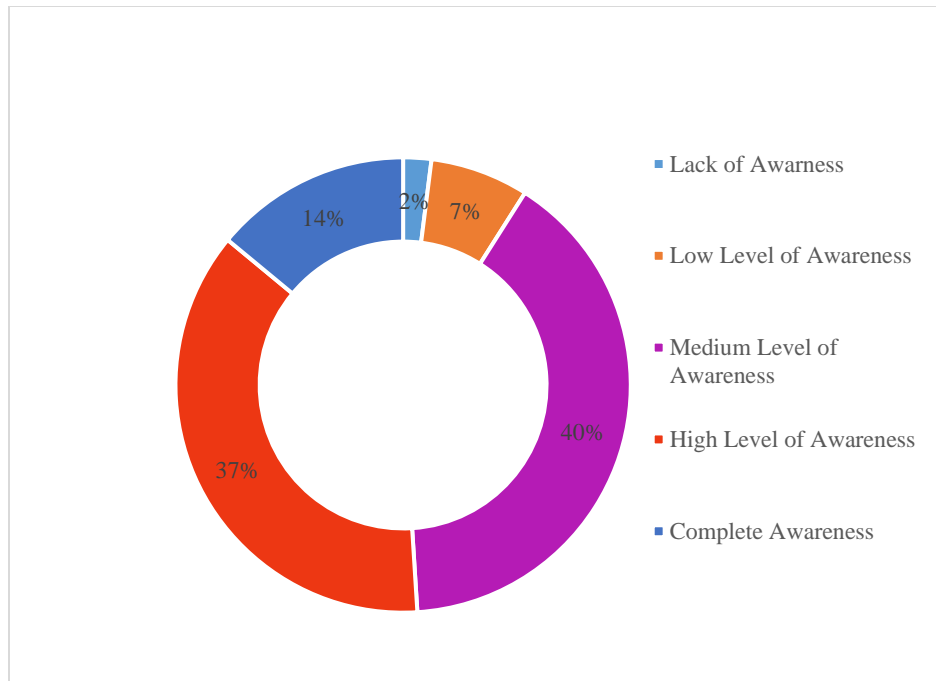


Consulting capability is highest at 'Competent' level, across all consulting types (IT Strategy consulting 33%, IT Architecture consulting 32%, IT Portfolio management 34%, IT Process consulting 45%, IT Governance consulting 37% and IT Outsourcing consulting 35%), except for IT Infrastructure consulting and IT Transformation consulting where it is 'Novice' (30%) and 'Proficient' (30%) respectively. Considering 'Competent' and above capability, the percentage capability is above 50% (except for IT Infrastructure consulting where it is 41%). Implying, a strong consulting capability across consulting types amongst the respondents.

### **5.2.3 Design Thinking Awareness**

Design thinking awareness ranked on a five point scale, ranging from Lack of awareness to Low level of awareness, Medium level of awareness, High level of awareness and Complete awareness (see Figure 5.5).

Awareness of design thinking is very high amongst the respondents. Stands at 46% for 'Medium level of awareness'. The percentages of respondents considering Medium level of awareness and above is a solid 90% plus. Such a strong reading of awareness of design thinking, coupled with competent consulting capability, raises the confidence of survey participants responses to alignment of design thinking principles and practices to consulting phases and consulting types.

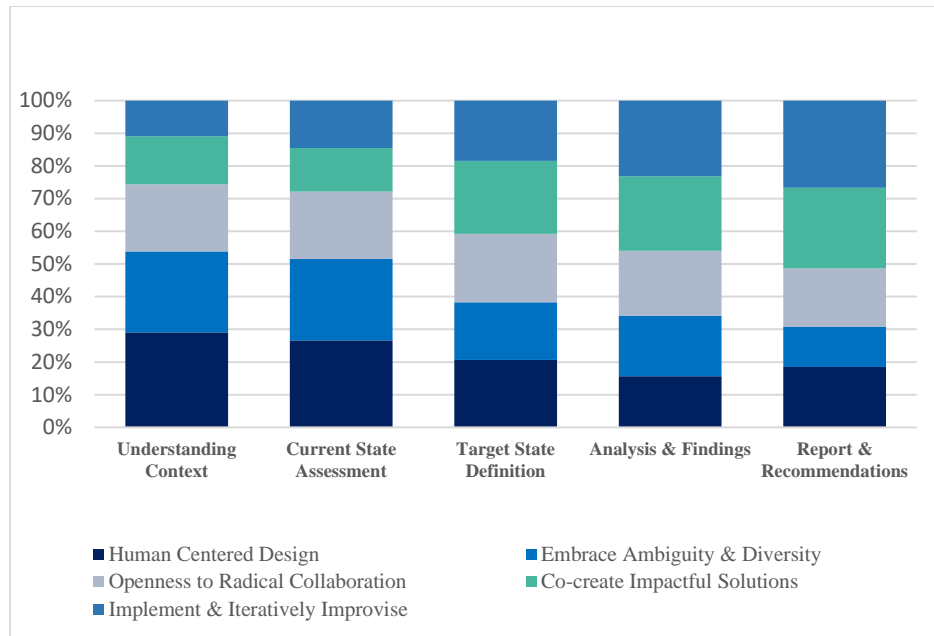


*Figure 5.5*  
*Design Thinking Awareness*

#### **5.2.4 Design Thinking Principles**

Design thinking principles applicability to consulting was analyzed on two dimensions; applicability of principles to consulting phases and applicability of principles to consulting types.

Applicability of the five design thinking principles – Human centered design (PRI-01), Embrace ambiguity & diversity (PRI-02), Openness to radical collaboration (PRI-03), Co-create impactful solutions (PRI-04) and Implement & iteratively improvise (PRI-05) to the five consulting phases – Understanding context, Current state assessment, Target state definition, Analysis & findings, Report & recommendations (refer Table 4.7).



*Figure 5.6*  
*Design Thinking Principles Applicability to Consulting Phases*

Human centered design (PRI-01) as a principle was found to be most applicable to Understanding context to uncover the real problems and to Target state definition to provide real solutions. The applicability was lowest in Analysis & findings.

Embrace ambiguity & diversity (PRI-02) was found to be most applicable to Understanding context acknowledging uncertainty and equally to Current state assessment and Target state definition. Emphasizes possible ambiguity around the drivers and the need to open to diverse views be it in assessing the current state or in defining the future state.

Openness to radical collaboration (PRI-03) was found to be most applicable to Target state definition to collaborate with diverse stakeholder within and outside the enterprise. Applicability was low for both Understanding context and Current state

assessment, implying convergence of insights as opposed to divergence of ideas for Target state definition.

Co-create impactful solutions (PRI-04) has high applicability to Target state definition, Analysis & findings and Report & recommendations, as these are the phases where solutions are defined, prototyped, tested and improved.

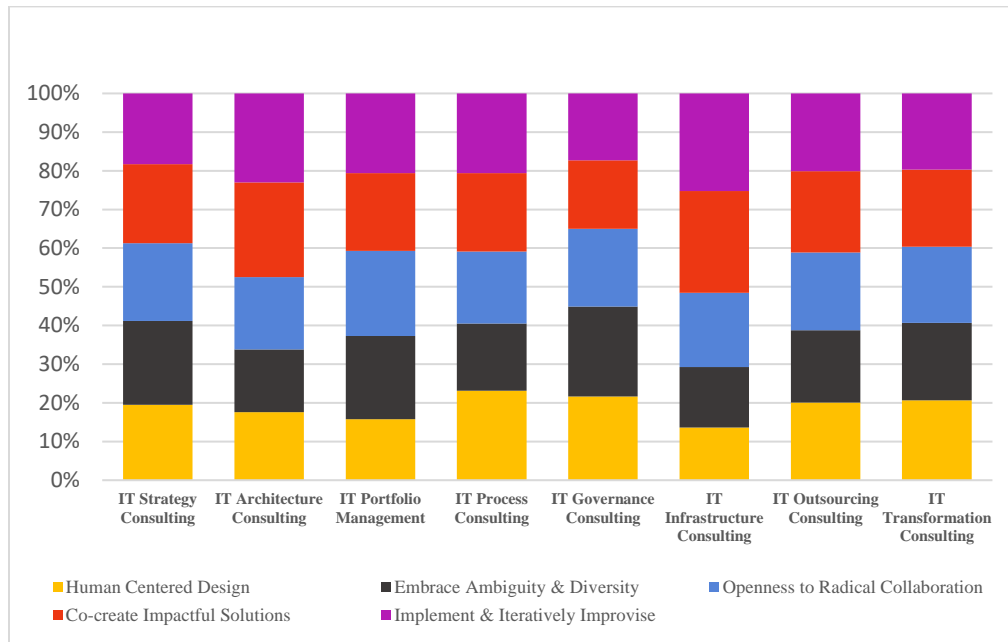
Implement & iteratively improve (PRI-05) has high applicability in Analysis & findings and Report & recommendations. Analysis helps in designing prototypes and findings from implementation are leveraged to fine-tune recommendations.

Applicability of the five design thinking Principles – Human centered design (PRI-01), Embrace ambiguity & diversity (PRI-02), Openness to radical collaboration (PRI-03), Co-create impactful solutions (PRI-04) and Implement & iteratively improve (PRI-05) to the eight consulting types – IT Strategy consulting, IT Architecture consulting, IT Portfolio management, IT Process consulting, IT Governance consulting, IT Infrastructure consulting, IT Outsourcing consulting, IT Transformation consulting (refer Table 4.8).

Human centered design (PRI-01) as a principle was found to be most applicable to IT Process consulting, there is a direct process element in people dimension an indirect process element in technology and business dimensions of IT Process consulting. The applicability was lowest in IT Infrastructure consulting.

Embrace ambiguity & diversity (PRI-02) was found to be most applicable to IT Strategy consulting cause the scope is generally quite diverse and many a time not well defined. The applicability was lowest in IT Infrastructure consulting.

Openness to radical collaboration (PRI-03) was found to be most applicable to IT Strategy consulting for reasons as stated above, the importance for collaboration got confirmed by respondents. IT Infrastructure consulting on the other hand, has well-defined objectives and outcomes, therefore ranks least applicable once again.



*Figure 5.7  
Design Thinking Principles Applicability to Consulting Types*

Co-create impactful solutions (PRI-04) has high applicability for both IT Strategy consulting and IT Architecture consulting. Scope and objectives of engagements here are quite similar, with a lot of know-how resting with client, necessitating consultants to collaborate and co-create along with clients to deliver impactful solutions. On the same token, dependency with clients is relatively less for IT Portfolio management, hence the applicability is low.

Implement & iteratively improve (PRI-05), applicability is high for IT Process consulting; of all the consulting types, its most easy to implement and improve. As there is no scope for iteration in IT Outsourcing consulting, the applicability is low.

### **5.2.5 Design Thinking Practices**

Design thinking practices applicability to consulting was analyzed on two dimensions; applicability of practices to consulting phases and applicability of practices to consulting types.

Applicability of the 12 design thinking practices – Empathy maps (PRA-01), User personas (PRA-02), How might we (PRA-03), Storyboarding (PRA-04), Interviewing techniques (PRA-05), Brainstroming (PRA-06), Business model canvas (PRA-07), Journey maps (PRA-08), Affinity diagrams (PRA-09), Raskar’s hexagon (PRA-10), Morphological analysis (PRA-11) and Value proposition canvas (PRA-12) to the five consulting phases – Understanding context, Current state assessment, Target state definition, Analysis & findings, Report & recommendations (refer Table 4.10).

Empathy maps (PRA-01), User personas (PRA-02) and Interviewing techniques (PRA-05) as practice’s were found to be most applicable in Understanding context. Human interactions are most in the first phase, hence the relevance of Empathy maps (PRA-01) to understand the context from a end user’s perspective. As the relevant stakeholders are identified for the engagement, User personas (PRA-02) are created and interviewed to navigate through the rest of the engagement. Of these three practices, User Personas (PRA-02) found most applicability in Current state assessment also.

How might we (PRA-03), Storyboarding (PRA-04), Brainstroming (PRA-06), Business model canvas (PRA-07) and Journey maps (PRA-08) found most applicability in Target state definition. How might we (PRA-03) can be prefixed to question's to explore all options in order to define a target state that meet's engagement objectives. These options can be leveraged to build storyboards.

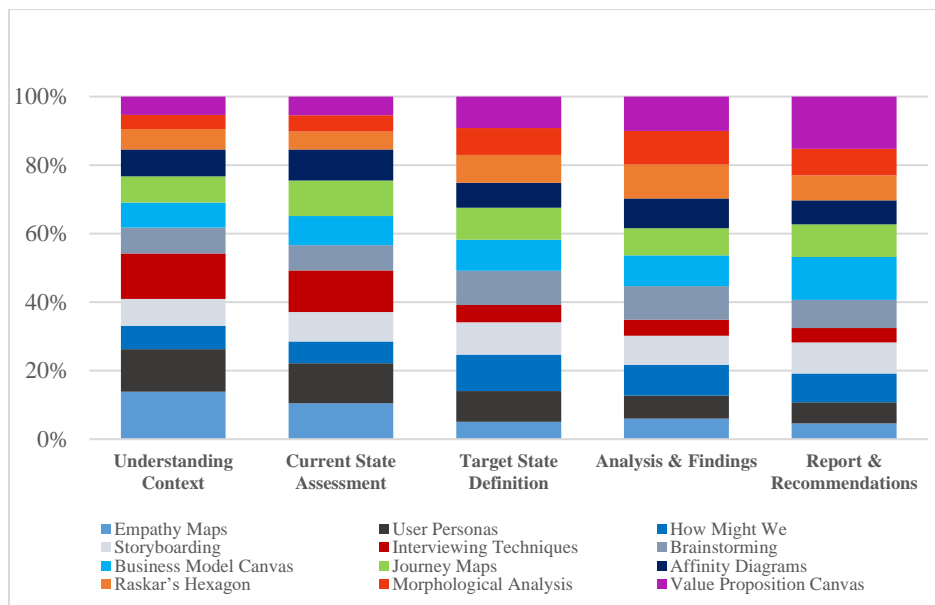


Figure 5.8  
Design Thinking Practices Applicability to Consulting Phases

Brainstroming (PRA-06) helps in evaluating the storyboards. The defined target state can then be populated on the Business model canvas (PRA-07) across the nine building blocks of the enterprise. Lastly, the path to reach the target state from the current state can be plotted as Journey maps.

Affinity diagrams (PRA-09), Raskar's hexagon (PRA-10) and Morphological analysis (PRA-11) are practices that had highest applicability in Analysis & findings phase. Each of these are analytical techniques with different objectives at the core;

aggregation in case of Affinity diagrams (PRA-09), adjacency in Raskkar's hexagon (PRA-10) and dis-aggregation in Morphological analysis (PRA-11).

Value proposition canvas (PRA-12) was found to be most applicable for Report & recommendations, to verify if the recommendations meet the engagement outcomes and stakeholder expectations, serving as pain relievers and / or gain creators.

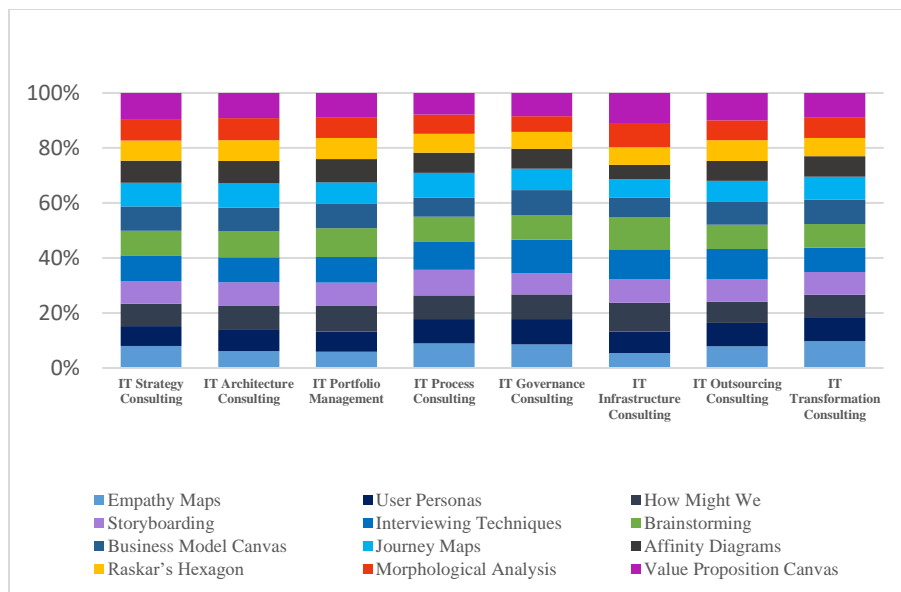
Applicability of the 12 design thinking practices – Empathy maps (PRA-01), User personas (PRA-02), How might we (PRA-03), Storyboarding (PRA-04), Interviewing techniques (PRA-05), Brainstroming (PRA-06), Business model canvas (PRA-07), Journey maps (PRA-08), Affinity diagrams (PRA-09), Raskar's hexagon (PRA-10), Morphological analysis (PRA-11) and Value proposition canvas (PRA-12) to the eight consulting types – IT Strategy consulting, IT Architecture consulting, IT Portfolio management, IT Process consulting, IT Governance consulting, IT Infrastructure consulting, IT Outsourcing consulting, IT Transformation consulting (refer Table 4.11).

A common result of survey, was the highest applicability of practices to be in IT Strategy consulting, given their broad scope and lowest applicability being in IT Infrastructure consulting, because of the limited expertise of this consulting capability amongst the respondents.

Other than that, Empathy maps (PRA-01), User personas (PRA-02) and Business model canvas (PRA-07) have a higher applicability for IT Transformation consulting, wherein the overall objective is to drive transformation, therefore the need to be human centric and comprehensive.



How might we (PRA-03) Storyboarding (PRA-04), Affinity diagrams (PRA-09), Morphological analysis (PRA-11) and Value proposition canvas (PRA-12) had a relatively higher applicability for IT Architecture consulting. Similar to IT Strategy consulting, IT Architecture consulting is an enterprise wide initiative, these practices are logical selection for assessment, analysis and articulation of recommendations.



*Figure 5.9*  
*Design Thinking Practices Applicability to Consulting Types*

Brainstorming (PRA-06), Journey maps (PRA-08) and Raskar's hexagon (PRA-10) have a high applicability in IT Process consulting. Whereas, Interviewing techniques (PRA-05) was found to have a high applicability in IT Governance consulting.

### 5.3 Discussion on Findings from Focus Group Discussion

The Design grid for each consulting type was arrived at, by analyzing the results from respective focus group discussion. In cases, where there was no one clear principle, the researchers experience was given weightage. Likewise, for practices, since these are

tools / techniques, survey responses were considered to arrive at a selection. The resultant Design grid was also validated through interviews with industry leaders.

### **5.3.1 Design Grid for Design Thinking in IT Strategy Consulting**

IT Strategy consulting is defining the roadmap for IT, that is aligned to business, elaborating upon the direction for the organization, architecture and infrastructure.

Understanding context involves understanding of drivers, business, technology, stakeholders, scope and outcomes. Key stakeholders are CIO or the Executive sponsor.

Therefore, assessment of current state and definition of target state would be on the business, technology and organization dimensions. Gap analysis would continue to be on these dimensions and the recommendations would be in the form of an IT Strategy roadmap with a reinforcing business case (Kancharla, 2016).

Design grid for IT Strategy consulting has been developed, taking into consideration the proceedings from focus group discussions and co-relating with survey responses on a need basis (refer Table 5.1).

In Understanding context the most relevant principle is Human centered design (PRI-01), as it enables a good connect with stakeholders and through them understand the drivers for the engagement including business, technology and organizational dynamics. Related practices to support the above objective are Empathy maps (PRA-01) and User personas (PRA-02). Empathy maps (PRA-01) capture each stakeholders' emotions and User personas (PRA-02) help in creating stakeholder expectations.

In Current state assessment, Embrace ambiguity & diversity (PRI-02) is the most relevant principle for IT Strategy consulting. Embrace ambiguity & diversity (PRI-02), as

the phase requires practitioner's to be open and know business, technology and organizational dimensions of the context. Related Practices are Storyboarding (PRA-04) and Interviewing techniques (PRA-05). Storyboarding (PRA-04) develops stories based on scenarios, which are a good way to playback current state visually to stakeholders. Interviewing techniques (PRA-05) help in connecting to each stakeholder to capture all relevant details.

The relevant principle in Target state definition is once again Embrace ambiguity & diversity (PRI-02). Target state necessitates exploring hitherto unexplored areas and would require practitioners to embrace ambiguity of business and diversity of available technologies. Related practices are How might we (PRA-03) and Business model canvas (PRA-07). The former helps in articulating ways to address the current pain points and design a viable target state. The later technique, helps visualize the various stakeholders and the value stream which would enable a better definition of the target state.

In Analysis & findings, the relevant principle was Co-create impactful solutions (PRI-04), ideas shared through a collaborative process can help create new concepts, solutions, services, and products leading to effective and viable solutions for the organization as a whole. Related practices are Brainstorming (PRA-06), Affinity diagrams (PRA-09) and Morphological analysis (PRA-11). Brainstorming (PRA-06) was a clear first choice of practice, collaborating with a diverse set of people involves differing interpretations of the data gathered, brainstorming helps to bring them all together to form a desired solution. For the second practice survey responses had to be considered. Affinity diagrams (PRA-09) in Analysis & findings – 61 (refer Table 4.10),

Affinity diagrams (PRA-09) in IT Strategy consulting – 64 (refer Table 4.11).  
Morphological analysis (PRA-11) in Analysis & findings – 67 (refer Table 4.10),  
Morphological analysis (PRA-11) in IT Strategy consulting – 63 (refer Table 4.11). In this case, the researcher gave precedence to the consulting type as opposed to the consulting phase. Thus, Affinity diagrams (PRA-09) which help in collecting ideas from a diverse set of stakeholders and grouping them into themes was selected as the second practice, for its higher rating on applicability to the IT Strategy consulting.

Implement & iteratively improvise (PRI-05) was the most relevant principle in Report & recommendations for IT Strategy consulting. This approach can help fine tune recommendations and ensure sustainable business value in the new technology solution, enables practitioners to bring their ideas to life and visualize the organizational outcomes. Practices related to Implement & iteratively improvise (PRI-05) are Storyboarding (PRA-04), Journey maps (PRA-08) and Value proposition canvas (PRA-12). Value proposition canvas (PRA-12) was a clear first choice of practice, shows how the new solution adds value to the business. For the second practice survey responses had to be considered. Storyboarding (PRA-04) in Report & Recommendations – 41 (refer Table 4.10), Storyboarding (PRA-04) in IT Strategy consulting – 67 (refer Table 4.10). Journey Maps (PRA-08) in Report & Recommendations – 43 (refer Table 4.10), Journey Maps (PRA-08) in IT Strategy consulting – 70 (refer Table 4.11). In this case, Journey maps (PRA-08) which help in creating and compiling the series of user actions into a timeline to achieve the target state, was selected as the second practice, for its higher rating on applicability to Report & recommendations phase as well as to IT Strategy consulting.

Table 5.1  
Design Grid for Design Thinking in IT Strategy Consulting

<b>Design thinking principle</b>	<b>Design thinking practice</b>	PRI-01 Human centered design	PRI-02 Embrace ambiguity & diversity	PRI-03 Openness to radical collaboration	PRI-04 Co-create impactful solutions	PRI-05 Implement & iteratively improvise
PRA-01 Empathy maps		UC				
PRA-02 User personas		UC				
PRA-03 How might we			TSD			
PRA-04 Storyboarding			CSA			
PRA-05 Interviewing techniques			CSA			
PRA-06 Brainstorming					A&F	
PRA-07 Business model canvas			TSD			
PRA-08 Journey maps						R&R
PRA-09 Affinity diagrams					A&F	
PRA-10 Raskar's hexagon						
PRA-11 Morphological analysis						
PRA-12 Value proposition canvas						R&R

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.

### **5.3.2 Design Grid for Design Thinking in IT Architecture Consulting**

IT Architecture consulting - is defining the business architecture and deriving the application, information and technical architectures that are modular as well as coupled. The components of enterprise architecture are business architecture – that provides an understanding of the business as collection of business components catering to specific business processes, application architecture – alignment of the application portfolio to the business architecture, information architecture – meta data of the information required by the application components and technical architecture – the underlying infrastructure to support the business operations, collectively governed by a set of architecture principles that are understandable, robust, complete, consistent and stable (Kancharla, 2016).

Design grid for IT Architecture consulting has been developed, taking into consideration the proceedings from focus group discussions and co-relating with survey responses on a need basis (refer Table 5.2).

In Understanding context, the most relevant principle is Embrace ambiguity & diversity (PRI-02) as it is important to understand the context from business, application, information and technical perspectives. The practices related to Embrace ambiguity & diversity (PRI-02) are found to be many; User personas (PRA-02), Storyboarding (PRA-04), Interviewing techniques (PRA-05), Business model canvas (PRA-07) and Journey maps (PRA-08). User personas (PRA-02) captures all the personas across the enterprise, was the first choice of Practice. For the second practice survey responses had to be considered. Storyboarding (PRA-04) in Understanding context – 47 (refer Table 4.10), Storyboarding (PRA-04) in IT Architecture consulting – 56 (refer Table 4.11).

Interviewing techniques (PRA-05) in Understanding context – 80 (refer Table 4.10),  
Interviewing techniques (PRA-05) in IT Architecture consulting – 59 (refer Table 4.11).  
Business model canvas (PRA-07) in Understanding context – 44 (refer Table 4.10),  
Business model canvas (PRA-07) in IT Architecture consulting – 55 (refer Table 4.11).  
Journey Maps (PRA-08) in Understanding context – 46 (refer Table 4.10), Journey Maps  
(PRA-08) in IT Architecture consulting – 57 (refer Table 4.11). In this case, Interviewing  
techniques (PRA-05) which facilitates interactions with stakeholders through architecture  
workshops, was selected as the second practice, for its higher rating on applicability to  
Understanding context phase as well as to IT Architecture consulting.

In Current state assessment the most relevant principle is Embrace ambiguity &  
diversity (PRI-02), for architecture it is equally important to understand the current state  
also from a business, application, information and technical perspectives. The practices  
related to Embrace ambiguity & diversity (PRI-02) are Storyboarding (PRA-04),  
Interviewing techniques (PRA-05) and Business model canvas (PRA-07). As there was a  
no clear top choice of a Practice, survey data was considered for all the three Practices.  
Storyboarding (PRA-04) in Current state assessment – 56 (refer Table 4.10),  
Storyboarding (PRA-04) in IT Architecture consulting – 56 (refer Table 4.11).  
Interviewing techniques (PRA-05) in Current state assessment – 78 (refer Table 4.10),  
Interviewing techniques (PRA-05) in IT Architecture consulting – 59 (refer Table 4.11).  
Business model canvas (PRA-07) in Current state assessment – 55 (refer Table 4.10),  
Business model canvas (PRA-07) in IT Architecture consulting – 55 (refer Table 4.11).

In this case, Interviewing techniques (PRA-05) and Business model canvas (PRA-07) were chosen as the two Practices for their higher rating on applicability to Current state assessment phase as well as to IT Architecture consulting. Once the user personas in place from the previous phase, Interviewing techniques (PRA-05) can be used to gather current state information and Business model canvas (PRA-07) can be used as a surrogate to reference architecture.

In Target state definition the most relevant principle is Human centered design (PRI-01) since the target state is all about sowing the seeds of future, new designs and new ways of working, the effort needs to be human centric. Practices related to Human centered design (PRI-01) in Target state definition are many; Empathy maps (PRA-01), User personas (PRA-02), How might we (PRA-03), Journey maps (PRA-08), Affinity diagrams (PRA-09) and Raskar's (PRA-10). Journey maps (PRA-08), capture the changes of internal and external stakeholder's journeys and was chosen as the first choice of practice. For the second practice survey responses had to be considered. Empathy maps (PRA-01) in Target state definition – 40 (refer Table 4.10), Empathy maps (PRA-01) in IT Architecture consulting – 40 (refer Table 4.11). User personas (PRA-02) in Target state definition – 70 (refer Table 4.10), User personas (PRA-02) in IT Architecture consulting – 50 (refer Table 4.11). How might we (PRA-03) in Target state definition – 83 (refer Table 4.10), How might we (PRA-03) in IT Architecture consulting – 56 (refer Table 4.11). Affinity diagrams (PRA-09) in Target state definition – 57 (refer Table 4.10), Affinity diagrams (PRA-09) in IT Architecture consulting – 53 (refer Table 4.11). Raskar's (PRA-10) in Target state definition – 64 (refer Table 4.10), Raskar's (PRA-10)



in IT Architecture consulting – 49 (refer Table 4.11). In this case, How might we (PRA-03) technique that can enable creating the right kind of impact on target state, was selected as the second practice, for its higher rating on applicability to Target state definition phase as well as to IT Architecture consulting.

The relevant principle for Analysis & findings is Co-create impactful solutions (PRI-04), solutions that have a clear linkage from business to application to information to technical architectures are co-created with participation from all relevant stakeholders. Related practices are Brainstorming (PRA-06) and Morphological analysis (PRA-11). Brainstorming (PRA-06), many ideas are generated through brainstorming, many solutions are also created when used in a structured way such as six thinking hats and lateral thinking. Morphological analysis (PRA-11), very useful tool to select the solution option from many available solutions generated from brainstorming.

In Report & recommendations the relevant principle is Implement & iteratively improvise (PRI-05), once the solution options are identified, they can be prototyped through conference room pilots to test the forward integration and backward traceability of the architecture components. The related practices are Storyboarding (PRA-04) and Value proposition canvas (PRA-12), Storyboarding (PRA-04) helps visualize how things will be in the future state. Value proposition canvas (PRA-12) is a very useful tool for articulating and demonstrating the value from the solution, also serve as a framework for prioritizing recommendations.

Table 5.2  
Design Grid for Design Thinking in IT Architecture Consulting

<b>Design thinking principle</b>	<b>Design thinking principle</b>	<b>Design thinking principle</b>	<b>Design thinking principle</b>	<b>Design thinking principle</b>	<b>Design thinking principle</b>
<b>Design thinking practice</b>	PRI-01 Human centered design	PRI-02 Embrace ambiguity & diversity	PRI-03 Openness to radical collaboration	PRI-04 Co-create impactful solutions	PRI-05 Implement & iteratively improvise
PRA-01 Empathy maps					
PRA-02 User personas		UC			
PRA-03 How might we	TSD				
PRA-04 Storyboarding					R&R
PRA-05 Interviewing techniques		UC CSA			
PRA-06 Brainstorming				A&F	
PRA-07 Business model canvas		CSA			
PRA-08 Journey maps	TSD				
PRA-09 Affinity diagrams					
PRA-10 Raskar's hexagon					
PRA-11 Morphological analysis				A&F	
PRA-12 Value proposition canvas					R&R

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.

### 5.3.3 Design Grid for Design Thinking in IT Portfolio Management

Portfolio management is about helping IT get the most out of its budgets, it is the processes, practices and specific activities to perform continuous and consistent

evaluation, prioritization, budgeting, and selection of investments that provide the greatest value and contribution to the strategic objectives of the organization. IT Portfolio management - is simplification of business processes, rationalization of application, consolidation of infrastructure and optimization of investments targeted towards operational excellence (Kancharla, 2016).

Design grid for IT Portfolio management has been developed, taking into consideration the proceedings from focus group discussions (refer Table 5.3). In this consulting type, across phases there was a clear winner for principle and practices.

The relevant principle for Understanding context in IT Portfolio management is Human centered design (PRI-01), in order to understand the expectations of the stakeholders, which could be related to some important emotions with regard to their respective application portfolio's, be it in terms of business processes, application development and maintenance, underlying infrastructure or with regard to IT investments and / or spend. Related practices are Empathy maps (PRA-01) and User personas (PRA-02). Empathy maps (PRA-01) capture the emotional aspects of the stakeholder's expectations and requirements, which are very essential for the balancing the portfolio. User personas (PRA-02) are critical to get all the involved stakeholders and ensure none are missed out.

In Current state assessment the relevant principle is Human centered design (PRI-01), is keeping humans at the core, the core of design thinking becomes relevant when centrality is put in assessing business processes, application development, existing infrastructure and current investments. Practices related to Human centered design (PRI-

01) in the context of IT Portfolio management in Current state assessment are Interviewing techniques (PRA-05) and Journey maps (PRA-08). Interviewing techniques (PRA-05) help to extract information of the IT portfolio and Journey maps (PRA-08) articulate in detail how business processes are defined, how applications are developed, maintained.

In Target state definition, the relevant principle for IT Portfolio management is Co-create impactful solutions (PRI-04), portfolio design needs to be co-created so that it is not biased either by business managers, application owners or third-party service providers. Practices related to Co-create impactful solutions (PRI-04) are Raskar's hexagon (PRA-10) Morphological analysis (PRA-11). Both are analytical / ideation tools which help establish synergies to cross analyze viewpoints of business, IT and vendors.

In IT Portfolio management, the most relevant principle for Analysis & findings is Embrace ambiguity & diversity (PRI-02) in order to explore multiple viewpoints of multiple stakeholders. Practices related to Embrace ambiguity & diversity (PRI-02) are How might we (PRA-03) to help solve the pain points of stakeholders and Brainstorming (PRA-06) to explore ways to solve existing pain points.

The most relevant principle for Report & recommendations is Human centered design (PRI-01) to ensure expectations of business managers, application managers, infrastructure engineers and third-party service providers are balanced. Related practices and Journey maps (PRA-08) and Value proposition canvas (PRA-12). Journey maps (PRA-08) to visualize how things will be in future. Value proposition canvas (PRA-12) to visualize the associated benefits.

Table 5.3  
Design Grid for Design Thinking in IT Portfolio Management

<b>Design thinking principle</b>	<b>Design thinking practice</b>	<b>PRI-01 Human centered design</b>	<b>PRI-02 Embrace ambiguity &amp; diversity</b>	<b>PRI-03 Openness to radical collaboration</b>	<b>PRI-04 Co-create impactful solutions</b>	<b>PRI-05 Implement &amp; iteratively improvise</b>
PRA-01 Empathy maps	UC					
PRA-02 User personas	UC					
PRA-03 How might we		A&F				
PRA-04 Storyboarding						
PRA-05 Interviewing techniques	CSA					
PRA-06 Brainstorming		A&F				
PRA-07 Business model canvas						
PRA-08 Journey maps	CSA R&R					
PRA-09 Affinity diagrams						
PRA-10 Raskar's hexagon					TSD	
PRA-11 Morphological analysis					TSD	
PRA-12 Value proposition canvas	R&R					

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.

### 5.3.4 Design Grid for Design Thinking in IT Process Consulting

IT Process consulting - is providing directions for improving the maturity of business and / or IT processes through continuous improvement and optimization. IT Process consulting broadly advises on two dimensions, process improvement and process

optimization. Process improvement relates to new development work and includes project planning, requirements definition, project execution, monitoring, supplier management and risk management (Kancharla, 2016).

Design grid for IT Process consulting has been developed, taking into consideration the proceedings from focus group discussions and co-relating with survey responses on a need basis (refer Table 5.4).

In Understanding context phase of IT Process consulting, the most relevant principle is Human centered design (PRI-01), opportunity to know what needs to be done first, process improvement or process optimization. The practices most related to Human centered design (PRI-01) are Empathy maps (PRA-01) and User personas (PRA-02). Empathy maps (PRA-01) capture the emotional aspects of the stakeholders' expectations and requirements, which are very essential for the understating the context and User personas (PRA-02) to understand the stakeholders for whom the processes are being revisited.

In Current state assessment, Embrace ambiguity & diversity (PRI-02) is the most relevant principle, process improvement and process optimization are subjective in nature and are open to ambiguity at times. Practices most related to Embrace ambiguity & diversity (PRI-02) are Business model canvas (PRA-07) and Affinity diagrams (PRA-09). Business model canvas (PRA-07) helps to paint the multiple dimensions involved in understanding the context and also helps resolve some of the ambiguities. Affinity diagrams (PRA-09), help in organizing the data into themes for better understating of the current state.

In Target state definition, Co-create impactful solutions (PRI-04) is the most relevant principle. Processes to capture all expectations for process improvement or process optimization are best co-created with relevant stakeholders. Related practices are How might we (PRA-03), Storyboarding (PRA-04), Brainstorming (PRA-06) and Business model canvas (PRA-07). Brainstorming (PRA-06) is in line with the principle to design the targeted process improvements. and was chosen as the first choice of Practice. For the second practice survey responses had to be considered. How might we (PRA-03) in Target state definition – 83 (refer Table 4.10), How might we (PRA-03) in IT Process consulting – 61 (refer Table 4.11). Storyboarding (PRA-04) in Target state definition – 74 (refer Table 4.10), Storyboarding (PRA-04) in IT Process consulting – 67 (refer Table 4.11). Business model canvas (PRA-07) in Target state definition – 72 (refer Table 4.10), Business model canvas (PRA-07) in IT Process consulting – 49 (refer Table 4.11). In this case researcher gave precedence to consulting phase and chose How might we (PRA-03) a technique that is very useful for create ideas on the key performance and key result area indicators, as the second practice for its higher rating on applicability to Target state definition phase.

In Analysis & findings the most relevant principle is Openness to radical collaboration (PRI-03) analysis is always grey, hence the need to collaborate with diverse stakeholders to get all the perspectives for process improvement or process optimization. Related practices are Brainstorming (PRA-06) and Journey maps (PRA-08). The former helps generate a lot of ideas for process design, key performance indicators and

calculations and the later can be used effectively to demonstrate the process changes / new process, its effect on the current working and the value it brings.

In Report & recommendations the most relevant principle is Implement & iteratively improvise (PRI-05) process changes are very difficult to embrace, hence an iterative implementation can be an effective approach to continuously improvise.

Practices related to Implement & iteratively improvise (PRI-05) are; Business model canvas (PRA-07) to effectively depict organization of the newly designed process, to visualize where they fit in and to verify completeness of transformation from current to future and Value proposition canvas (PRA-12) can be used to articulate the value from the newly designed process areas and processes.

*Table 5.4  
Design Grid for Design Thinking in IT Process Consulting*

<b>Design thinking principle</b>	<b>PRI-01 Human centered design</b>	<b>PRI-02 Embrace ambiguity &amp; diversity</b>	<b>PRI-03 Openness to radical collaboration</b>	<b>PRI-04 Co-create impactful solutions</b>	<b>PRI-05 Implement &amp; iteratively improvise</b>
<b>Design thinking practice</b>					
PRA-01 Empathy maps	UC				
PRA-02 User personas	UC				
PRA-03 How might we				TSD	
PRA-04 Storyboarding					
PRA-05 Interviewing techniques					
PRA-06 Brainstorming			A&F	TSD	
PRA-07 Business model canvas		CSA			R&R



<b>Design thinking principle</b>	<b>Design thinking practice</b>	PRI-01 Human centered design	PRI-02 Embrace ambiguity & diversity	PRI-03 Openness to radical collaboration	PRI-04 Co-create impactful solutions	PRI-05 Implement & iteratively improvise
	PRA-08 Journey maps			A&F		
	PRA-09 Affinity diagrams		CSA			
	PRA-10 Raskar's hexagon					
	PRA-11 Morphological analysis					
	PRA-12 Value proposition canvas					R&R

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.

### **5.3.5 Design Grid for Design Thinking in IT Governance Consulting**

IT Governance consulting - is defining the governance structures, mechanisms, processes and measures that would best enable IT to support the business. The role of IT governance is to establish a structure that can maximize value delivered by IT, through proven governance processes. The structure in turn is strengthened by well-defined roles and responsibilities. The roles mandate specific decision-making mechanisms pertinent to the specific IT domain. The mechanisms are supported by measurements that rightfully reflect their performance and are monitored by empowered committees. The beauty of this sequence is that it can withstand new business models, changing business practices and also balance IT costs (Kancharla, 2016).

Design grid for IT Governance consulting has been developed, taking into consideration the proceedings from focus group discussions and co-relating with survey responses on a need basis (refer Table 5.5).

In Understanding context phase of IT Governance consulting, the most relevant principle is Human centered design (PRI-01), it is important to understand, the context from an organizational structure and prevailing governance mechanisms, measures. Governance is all about the human working together as per the company objectives. The practices most related to Human centered design (PRI-01) are Empathy maps (PRA-01) and User personas (PRA-02). Empathy maps (PRA-01) is an excellent tool to understand, the human aspects, requirements for governance, it gives for each stakeholder, pains, gains, their thought process, emotions and how the stakeholders interact with various products and services. User personas (PRA-02) to understand the nature of stakeholders. For governance it is important to capture all the user personas in the ecosystem.

In Current state assessment the most relevant principle was, Embrace ambiguity & diversity (PRI-02). For governance it is important to seek information from all corners in order to understand the current state of governance structures, mechanisms, measures and processes. Related practices are Storyboarding (PRA-04), Interviewing techniques (PRA-05) and Journey maps (PRA-08). Interviewing techniques (PRA-05) was the most relevant choice of practice. Once the user personas in place from the previous phase, this technique can be used to gather all the information of the current state - details of stakeholders needs, roles and responsibilities. For the second practice survey responses had to be considered. Storyboarding (PRA-04) in Current state assessment – 56 (refer

Table 4.10), Storyboarding (PRA-04) in IT Governance consulting – 40 (refer Table 4.11). Journey maps (PRA-08) in Current state assessment – 67 (refer Table 4.10), Journey maps (PRA-08) in IT Governance consulting – 41 (refer Table 4.11). Journey maps (PRA-08) that helps in articulating how stakeholders think and behave within the existing organizational structures was chosen as the second practice for its higher rating on applicability to Current state assessment and IT Governance consulting.

In Target state definition the most relevant practice was, Human centered design (PRI-01), an important principle when deciding on the target state of an enterprise. Captures inputs from various stakeholders, including their expectations with regard to governance mechanisms and measures. Practices related to Human centered design (PRI-01) are Empathy maps (PRA-01), User personas (PRA-02), Business model canvas (PRA-07), Journey maps (PRA-08) and Raskar's hexagon (PRA-10). In this case, since there were no clear choices, survey responses had to be considered to find the two most related practices. Empathy maps (PRA-01) in Target state definition – 40 (refer Table 4.10), Empathy maps (PRA-01) in IT Governance consulting – 45 (refer Table 4.11). User personas (PRA-02) in Target state definition – 70 (refer Table 4.10), User personas (PRA-02) in IT Governance consulting – 48 (refer Table 4.11). Business model canvas (PRA-07) in Target state definition – 71 (refer Table 4.10), Business model canvas (PRA-07) in IT Governance consulting – 47 (refer Table 4.11). Journey maps (PRA-08) in Target state definition – 73 (refer Table 4.10), Journey maps (PRA-08) in IT Governance consulting – 41 (refer Table 4.11). In this case, the researcher chose User Personas (PRA-02) for its higher rating on applicability to IT Governance consulting and

Journey maps (PRA-08) for its higher rating on applicability to Target state definition. User personas (PRA-02) things will change a lot for internal and external stakeholders post re-structuring, therefore it is important to know their personas and their journeys in the new organization. Journey maps (PRA-08) an effective tool to map the target state, represents how the structure would impact relevant stakeholders.

In Analysis & findings phase of IT Governance consulting, the most relevant principle is Co-create impactful solutions (PRI-04), this is a critical phase where solutions are evolved for target state and hence, impactful organizational structures and governance mechanisms can be established with interested parties who have a stake. Practices most relevant to Co-create impactful solutions (PRI-04) are Brainstorming (PRA-06) and Journey maps (PRA-08). Brainstorming (PRA-06), as many ideas on governance processes and measures can be articulated using this practice. Journey maps (PRA-08) to see if required governance structures and mechanisms are in place.

In Report & recommendations phase the most relevant principle was, Implement & iteratively improvise (PRI-05), once the structures and mechanisms are developed, these can be tried out to find the right combinations to go forward with, hence consider implementing iteratively. Practices relevant to Implement & iteratively improvise (PRI-05) are Storyboarding (PRA-04), Business model canvas (PRA-07), Value proposition canvas (PRA-12). Value proposition canvas (PRA-12) that can be leveraged to demonstrate the value going forward was the most related practice. For the second practice survey responses had to be considered. Storyboarding (PRA-04) in Report & recommendations – 41 (refer Table 4.10), Storyboarding (PRA-04) in IT Governance

consulting – 40 (refer Table 4.11). Business model canvas (PRA-07) in Report & recommendations – 57 (refer Table 4.10), Business model canvas (PRA-07) in IT Governance consulting – 47 (refer Table 4.11). In this case, researcher gave precedence to consulting type and chose Business model canvas (PRA-07) for its higher rating on applicability to IT Governance consulting. Business model canvas (PRA-07) has an effective representation of the enterprise after implementation of governance structures and mechanisms.

*Table 5.5  
Design Grid for Design Thinking in IT Governance Consulting*

<b>Design thinking principle</b>	<b>PRI-01 Human centered design</b>	<b>PRI-02 Embrace ambiguity &amp; diversity</b>	<b>PRI-03 Openness to radical collaboration</b>	<b>PRI-04 Co-create impactful solutions</b>	<b>PRI-05 Implement &amp; iteratively improvise</b>
<b>Design thinking practice</b>					
PRA-01 Empathy maps	UC				
PRA-02 User personas	UC TSD				
PRA-03 How might we					
PRA-04 Storyboarding					
PRA-05 Interviewing techniques		CSA			
PRA-06 Brainstorming				A&F	
PRA-07 Business model canvas					R&R
PRA-08 Journey maps	TSD	CSA		A&F	
PRA-09 Affinity diagrams					
PRA-10 Raskar's hexagon					

<b>Design thinking principle</b>	<b>Design thinking practice</b>	PRI-01 Human centered design	PRI-02 Embrace ambiguity & diversity	PRI-03 Openness to radical collaboration	PRI-04 Co-create impactful solutions	PRI-05 Implement & iteratively improvise
PRA-11 Morphological analysis						
PRA-12 Value proposition canvas						R&R

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.

### 5.3.6 Design Grid for Design Thinking in IT Infrastructure Consulting

IT Infrastructure consulting - is optimizing the utilization infrastructure ecosystem, comprising of data center, end-user computing, help desk, service management plus investments. Infrastructure consulting focuses on infrastructure utilization, infrastructure spend analysis, the emphasis here is on audit and / or benchmarking. Once reasonable maturity is achieved, enterprises undertake infrastructure optimization of infrastructure utilization and spend to better the benchmark (Kancharla, 2016).

Design grid for IT Infrastructure consulting has been developed, taking into consideration the proceedings from focus group discussions and co-relating with survey responses on a need basis (refer Table 5.6).

In Understanding context the most relevant principle for IT Infrastructure consulting is Embrace ambiguity & diversity (PRI-02). In this consulting phase the practitioner does not have view of all the elements, therefore it is critical to understand

both the obvious reasons for transformation as well as the not so obvious. Practices related to Embrace ambiguity & diversity (PRI-02) are Empathy maps (PRA-01), User Personas (PRA-02), Brainstorming (PRA-06), Business model canvas (PRA-07) and Journey maps (PRA-08). Since none of the Practices stood out distinctively, survey data had to be used for all the practices. Empathy maps (PRA-01) in Understanding context – 83 (refer Table 4.10), Empathy maps (PRA-01) in IT Infrastructure consulting – 22 (refer Table 4.11). User personas (PRA-02) in Understanding context – 75 (refer Table 4.10), User personas (PRA-02) in IT Infrastructure consulting – 31 (refer Table 4.11). Brainstorming (PRA-06) in Understanding context – 45 (refer Table 4.10), Brainstorming (PRA-06) in IT Infrastructure consulting – 47 (refer Table 4.11). Business model canvas (PRA-07) in Understanding context – 44 (refer Table 4.10), Business model canvas (PRA-07) in IT Infrastructure consulting – 28 (refer Table 4.11). Journey maps (PRA-08) in Understanding context – 46 (refer Table 4.10), Journey maps (PRA-08) in IT Infrastructure consulting – 27 (refer Table 4.11). Researcher gave precedence to consulting phase and chose Empathy maps (PRA-01) and User personas (PRA-02) for their higher rating on applicability to Understanding context. Empathy maps (PRA-01) an excellent tool to understand the human aspects and requirements for transformation. User personas (PRA-02) captures all the user personas in the eco system.

In Current state assessment the most relevant principle is Openness to radical collaboration (PRI-03). Openness to radical collaboration (PRI-03) need to collaborate in the absence of real information, may need to get details from vendors or partners.

Practices related to Openness to radical collaboration (PRI-03) are How might we (PRA-

03), Storyboarding (PRA-04) and Interviewing techniques (PRA-05). Interviewing techniques (PRA-05) using personas from previous phase, this technique can be leveraged to gather information of current state was the first choice of practice. For the second practice, survey data had to be considered. How might we (PRA-03) in Current state assessment – 41 (refer Table 4.10), How might we (PRA-03) in IT Infrastructure consulting – 42 (refer Table 4.11). Storyboarding (PRA-04) in Current state assessment – 56 (refer Table 4.10), Storyboarding (PRA-04) in IT Infrastructure consulting – 34 (refer Table 4.11). Researcher gave precedence to consulting phase and chose Storyboarding (PRA-04) which helps in creating use cases for infrastructure services as the second practice for its higher rating on applicability to Current state assessment.

In Target state definition, Human centered design (PRI-01) was unanimously the most relevant principle. Human centered design (PRI-01) is an important principle when deciding the target state of an enterprise, infrastructure plays a key role in enhancing human experience. Practices related to Human centered design (PRI-01) are Empathy maps (PRA-01), User personas (PRA-02), Storyboarding (PRA-04), Business model canvas (PRA-07) and Journey maps (PRA-08). Business model canvas (PRA-07) very effective tool to map the target state of the enterprise from the nine perspectives was the most related practice. For the second practice survey had to be considered. Empathy maps (PRA-01) in Target state definition – 40 (refer Table 4.10), Empathy maps (PRA-01) in IT Infrastructure consulting – 22 (refer Table 4.11). User personas (PRA-02) in Target state definition – 70 (refer Table 4.10), User personas (PRA-02) in IT Infrastructure consulting – 31 (refer Table 4.11). Storyboarding (PRA-04) in Target state



definition – 74 (refer Table 4.10), Storyboarding (PRA-04) in IT Infrastructure consulting – 34 (refer Table 4.11). Journey maps (PRA-08) in Target state definition – 73 (refer Table 4.10), Journey maps (PRA-08) in IT Infrastructure consulting – 27 (refer Table 4.11). Storyboarding (PRA-04) was chosen as the second practice for its higher rating on applicability to Target state definition and IT Infrastructure consulting, helps to target scenarios.

In Analysis & findings the most relevant principle is Co-create impactful solutions (PRI-04). Co-create impactful solutions (PRI-04) is a critical phase where solutions are evolved for target state and hence, impactful solutions and processes can be developed and deployed with interested parties. Practices related to Co-create impactful solutions (PRI-04) are Brainstorming (PRA-06) and Journey maps (PRA-08). Brainstorming (PRA-06) many ideas are generated thru brainstorming, many ideas are also created when used in a structured way such as six thinking hats and lateral thinking. Journey maps (PRA-08) can be extended here so see if how target state systems are expected to function.

In Report & recommendations, Implement & iteratively improvise (PRI-05) was unanimously the most relevant principle. Implement & iteratively improvise (PRI-05) once the technology solutions and process, structures and mechanisms are developed, they need be tried to check the results. Practices that are most related to Implement & iteratively improvise (PRI-05) are Journey maps (PRA-08) and Value proposition canvas (PRA-12). Journey maps (PRA-08) an effective representation of the infrastructure

process, high-lighting the before and after effect and the improvements it brings. Value proposition canvas (PRA-12) useful tool for articulating the value from the solutions.

*Table 5.6  
Design Grid for Design Thinking in IT Infrastructure Consulting*

<b>Design thinking principle</b>	<b>PRI-01 Human centered design</b>	<b>PRI-02 Embrace ambiguity &amp; diversity</b>	<b>PRI-03 Openness to radical collaboration</b>	<b>PRI-04 Co-create impactful solutions</b>	<b>PRI-05 Implement &amp; iteratively improve</b>
<b>Design thinking practice</b>					
PRA-01 Empathy maps		UC			
PRA-02 User personas		UC			
PRA-03 How might we					
PRA-04 Storyboarding	TSD		CSA		R&R
PRA-05 Interviewing techniques			CSA		
PRA-06 Brainstorming				A&F	
PRA-07 Business model canvas	TSD				
PRA-08 Journey maps				A&F	
PRA-09 Affinity diagrams					
PRA-10 Raskar's hexagon					
PRA-11 Morphological analysis					
PRA-12 Value proposition canvas					R&R

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.

### **5.3.7 Design Grid for Design Thinking in IT Outsourcing Consulting**

IT Outsourcing consulting - is evaluating the right-selection of a model (shared service vs captive) or location (near-shore vs offshore) or vendor(s) for outsourcing or offshoring. Outsourcing consulting originated in application outsourcing starting with application maintenance then application development and later extended into infrastructure services and business process outsourcing. Organizations gained maturity in these forms of outsourcing and started to leverage this experience in setting up their own shared services center or captive centers (Kancharla, 2016).

Design grid for IT Outsourcing consulting has been developed, taking into consideration the proceedings from focus group discussions and co-relating with survey responses on a need basis (refer Table 5.7).

In Understanding context the most relevant principle is Embrace ambiguity & diversity (PRI-02) for outsourcing, it is not always clear as to what can be outsourced, there is a need to embrace ambiguity to explore various layers in the organization and variety of stakeholders that includes vendors and third party service providers. Practices relevant to Embrace ambiguity & diversity (PRI-02) are Empathy maps (PRA-01), User personas (PRA-02) and How might we (PRA-03). Empathy maps (PRA-01) which is an excellent tool to understand, the human aspects of each stakeholder it gives pains, gains, thoughts, emotions and also the way each stakeholder interacts with various products and services, was the first choice of practice. For the second practice survey responses had to be considered. User personas (PRA-02) in Understanding context – 75 (refer Table 4.10), User personas (PRA-02) in IT Outsourcing consulting – 37 (refer Table 4.11). How

might we (PRA-03) in Understanding context – 41 (refer Table 4.10), How might we (PRA-03) in IT Outsourcing consulting – 33 (refer Table 4.11). User personas (PRA-02) that captures all the user personas in the eco system, both internal and external was chosen as the second practice for its higher rating on applicability to Understanding context and IT Outsourcing consulting.

In Current state assessment the most relevant Principle was Openness to radical collaboration (PRI-03), for outsourcing it is important to understand the current state of affairs from business, application, technology, infrastructure from various business managers, application owners, technology architects, network engineers and third-party service providers. Practices related to Embrace ambiguity & diversity (PRI-02) are Storyboarding (PRA-04), Interviewing techniques (PRA-05), Business model canvas (PRA-07) and Journey maps (PRA-08). Interviewing techniques (PRA-05) that can be used to gather all the information of the current state to understand in detail the stakeholder needs, roles, responsibilities and how work is being done currently including user's value chain, was the first choice of practice. For the second practice survey responses had to be considered. Storyboarding (PRA-04) in Current state assessment – 56 (refer Table 4.10), Storyboarding (PRA-04) in IT Outsourcing consulting – 35 (refer Table 4.11). Business model canvas (PRA-07) in Current state assessment – 55 (refer Table 4.10), Business model canvas (PRA-07) in IT Outsourcing consulting – 36 (refer Table 4.11). Journey maps (PRA-08) in Current state assessment – 67 (refer Table 4.10), Journey maps (PRA-08) in IT Outsourcing consulting – 33 (refer Table 4.11). In this case, the researcher gave precedence to consulting phase and chose Journey maps (PRA-

08) as the second practice related to Current state assessment. Journey maps (PRA-08) help in visualizing, what can be outsourced and what cannot.

In Target state definition, the most relevant principle was Human centered design (PRI-01), when deciding the target state of an enterprise, it is imperative to capture the inputs from people are directly impacted, their way of working in relation to the potential changes to their environment. Practices most related to Human centered design (PRI-01) in Target state definition are Brainstorming (PRA-06) and Business model canvas (PRA-07). Brainstorming (PRA-06) is an effective tool to discuss, debate and design the target state. Business model canvas (PRA-07) to map the target state of the enterprise from the nine perspectives and compare the current state with the target state in terms of new way of doing business.

In Analysis & findings the most relevant principle was Co-create impactful solutions (PRI-04), this is a critical phase where solutions are evolved for target state and hence, impactful technology solutions for application outsourcing or infrastructure outsourcing and impactful business processes have to be developed and deployed. Practice related to Co-create impactful solutions (PRI-04) are Brainstorming (PRA-06), Journey maps (PRA-08), Affinity diagrams (PRA-09) and Morphological analysis (PRA-11). In this case, there were no clear choice for the most related practices, hence survey responses had to be considered for all practices. Brainstorming (PRA-06) in Analysis & findings – 67 (refer Table 4.10), Brainstorming (PRA-06) in IT Outsourcing consulting – 38 (refer Table 4.11). Journey maps (PRA-08) in Analysis & findings – 54 (refer Table 4.10), Journey maps (PRA-08) in IT Outsourcing consulting – 33 (refer Table 4.11).

Affinity diagrams (PRA-09) in Analysis & findings – 59 (refer Table 4.10), Affinity diagrams (PRA-09) in IT Outsourcing consulting – 31 (refer Table 4.11). Morphological analysis (PRA-11) in Analysis & findings – 67 (refer Table 4.10), Morphological analysis (PRA-11) in IT Outsourcing consulting – 31 (refer Table 4.11). In this case, the researcher chose Brainstorming (PRA-06) for its higher rating on applicability to IT Outsourcing consulting and Morphological analysis (PRA-11) for its higher rating on applicability to Analysis & findings. Brainstorming (PRA-06) using which many ideas are generated for the best possible outsourcing models. Morphological analysis (PRA-11) an effective tool to make conclusions from the facts and findings from analysis.

In Report & recommendations the most relevant principle was Implement & iteratively improvise (PRI-05) once the technology solutions, business process and are developed, these need to be tried to check the results during transition. Practices related to Implement & iteratively improvise (PRI-05) are Storyboarding (PRA-04), Business model canvas (PRA-07) and Value proposition canvas (PRA-12). Value proposition canvas (PRA-12) useful tool for articulating and demonstrating the business value, which is usually very compelling for outsourcing was the first choice of practice. For the second practice survey responses had to be considered. Storyboarding (PRA-04) in Report & recommendations – 41 (refer Table 4.10), Storyboarding (PRA-04) in IT Outsourcing consulting – 35 (refer Table 4.11). Business model canvas (PRA-07) in Report & recommendations – 57 (refer Table 4.10), Business model canvas (PRA-07) in IT Outsourcing consulting – 36 (refer Table 4.11). In this case, Business model canvas (PRA-07) was chosen as the second related practice for its higher rating on applicability

to IT Outsourcing consulting and Report & recommendations phase. Business model canvas (PRA-07) is effective representation of the enterprise both in terms of the outsourced entity and the retained entity.

*Table 5.7  
Design Grid for Design Thinking in IT Outsourcing Consulting*

<b>Design thinking principle</b>	<b>Design thinking principle</b>	<b>Design thinking principle</b>	<b>Design thinking principle</b>	<b>Design thinking principle</b>	<b>Design thinking principle</b>
<b>Design thinking practice</b>	PRI-01 Human centered design	PRI-02 Embrace ambiguity & diversity	PRI-03 Openness to radical collaboration	PRI-04 Co-create impactful solutions	PRI-05 Implement & iteratively improvise
PRA-01 Empathy maps		UC			
PRA-02 User personas		UC			
PRA-03 How might we					
PRA-04 Storyboarding					
PRA-05 Interviewing techniques			CSA		
PRA-06 Brainstorming	TSD			A&F	
PRA-07 Business model canvas	TSD				R&R
PRA-08 Journey maps			CSA		
PRA-09 Affinity diagrams					
PRA-10 Raskar's hexagon					
PRA-11 Morphological analysis				A&F	
PRA-12 Value proposition canvas					R&R

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.

### **5.3.8 Design Grid for Design Thinking in IT Transformation Consulting**

IT Transformation consulting - is enabling the enterprise to realize its vision, through implementation of strategic directions provided for one or more of the consulting segments. IT Transformation consulting is usually a combination of two or more of the segments of the consulting spectrum. What is important is not the number of segments selected, but pegging the rightful segment at the core and populating relationships with the other segments, the corollaries. Equal attention has to be paid to transformation management, which includes change management, risk management and programme management (Kancharla, 2016).

Design grid for IT Transformation consulting has been developed, taking into consideration the proceedings from focus group discussions and co-relating with survey responses on a need basis (refer Table 5.8).

In Understanding context for IT Transformation consulting, the most relevant principle is Embrace ambiguity & diversity (PRI-02). Transformation consulting is typically a combination of two or more consulting types, increasing the diversity in engagement scope and with it comes increased ambiguity. The stakeholders to interact with would also be manifold. Practices related to Embrace ambiguity & diversity (PRI-02) are Empathy maps (PRA-01), User personas (PRA-02) and Interviewing techniques (PRA-05). Empathy maps (PRA-01), is an excellent tool to understand, the human aspects, requirements for transformation, it gives the for each stakeholder, pains, gains, ones thought process and emotions and was the first choice of practice. For the second practice survey responses had to be considered. User personas (PRA-02) in



Understanding context – 75 (refer Table 4.10), User personas (PRA-02) in IT Transformation consulting – 57 (refer Table 4.11). Interviewing techniques (PRA-05) in Understanding context – 80 (refer Table 4.10), Interviewing techniques (PRA-05) in IT Transformation consulting – 19 (refer Table 4.11). In this case, User personas (PRA-02) was chosen as the second related practice for its higher rating on applicability to IT Transformation consulting and an equally good rating on applicability to the consulting phase. User personas (PRA-02) for transformation it is important to capture all the user personas in the eco system.

In Current state assessment, true to the nature of IT Transformation consulting engagements, there was no one clear choice for a relevant principle and hence survey data had to be considered as an exception for Human centered design (PRI-01), Embrace ambiguity & diversity (PRI-02) and Openness to radical collaboration (PRI-03). Human centered design (PRI-01) in Current state assessment – 66 (refer Table 4.7), Human centered design (PRI-01) in IT Transformation consulting – 61 (refer Table 4.8). Embrace ambiguity & diversity (PRI-02) in Current state assessment – 62 (refer Table 4.7), Embrace ambiguity & diversity (PRI-02) in IT Transformation consulting – 59 (refer Table 4.8). Openness to radical collaboration (PRI-03) in Current state assessment – 51 (refer Table 4.7), Openness to radical collaboration (PRI-03) in IT Transformation consulting – 58 (refer Table 4.8). Human centered design (PRI-01) was thus chosen as the most relevant principle for its higher rating on applicability to consulting type and consulting phase. Human centered design (PRI-01) aids in getting a detailed understand of how things are today and how it impacts various stakeholders. Practices related to

Human centered design (PRI-01) are Empathy maps (PRA-01) and How might we (PRA-03). Empathy maps (PRA-01) to understand in detail the stakeholder needs, roles and responsibilities and their pain points. How might we (PRA-03) to understand how can we make a positive change in the way of working of various stakeholders.

Like in Current state assessment, Target state definition also did not have one clear choice for a relevant principle and hence survey data had to be considered as an exception for Human centered design (PRI-01), Openness to radical collaboration (PRI-03) and Co-create impactful solutions (PRI-04). Human centered design (PRI-01) in Target state definition – 73 (refer Table 4.7), Human centered design (PRI-01) in IT Transformation consulting – 61 (refer Table 4.8). Openness to radical collaboration (PRI-03) in Target state definition – 62 (refer Table 4.7), Openness to radical collaboration (PRI-03) in IT Transformation consulting – 59 (refer Table 4.8). Co-create impactful solutions (PRI-04) in Target state definition – 51 (refer Table 4.7), Co-create impactful solutions (PRI-04) in IT Transformation consulting – 58 (refer Table 4.8). Human centered design (PRI-01) was thus chosen as the most relevant principle for its higher rating on applicability to consulting type and consulting phase. Human centered design (PRI-01) an important principle when deciding the target state of an enterprise, it is imperative to capture the inputs from various stakeholders and know of their expectations. Related practices are How might we (PRA-03) and Business model canvas (PRA-07). How might we (PRA-03), can arrive at some unique ideas using this technique, leveraging use cases from Current state assessment. Business model canvas (PRA-07) to map the target state of the enterprise from the nine perspectives.

In Analysis & findings phase of IT Transformation consulting, the most relevant principle is Co-create impactful solutions (PRI-04) keeping in mind the consulting type that needs to be at the core and how it relates to the other corollary consulting types. Analysis & findings is a critical phase where solutions are evolved for target state and hence, impactful technology solutions and processes needs to be developed and deployed with interested parties who have a stake, collaborate to create the best of solutions. Practices related to Co-create impactful solutions (PRI-04) are Brainstorming (PRA-06), Journey maps (PRA-08), Affinity diagrams (PRA-09) and Morphological analysis (PRA-11). Since none of the practices stood out distinctively, survey data had to be considered for all the practices. Brainstorming (PRA-06) in Analysis & findings – 67 (refer Table 4.10), Brainstorming (PRA-06) in IT Transformation consulting – 56 (refer Table 4.11). Journey maps (PRA-08) in Analysis & findings – 54 (refer Table 4.10), Journey maps (PRA-08) in IT Transformation consulting – 54 (refer Table 4.11). Affinity diagrams (PRA-09) in Analysis & findings – 59 (refer Table 4.10), Affinity diagrams (PRA-09) in IT Transformation consulting – 48 (refer Table 4.11). Morphological analysis (PRA-11) in Analysis & findings – 67 (refer Table 4.10), Morphological analysis (PRA-11) in IT Transformation consulting – 49 (refer Table 4.11). In this case, research gave precedence to Consulting phase and chose Brainstorming (PRA-06) and Morphological analysis (PRA-11) as the two most related practices for their higher rating on applicability. Brainstorming (PRA-06), many ideas are generated, many are also created when used in a structured way such as six thinking hats and lateral thinking. Morphological analysis (PRA-11), An effective tool to make conclusions from the facts and findings.

In Report & recommendations, the most relevant Principle is Implement & iteratively improvise (PRI-05), once the transformation needs to business, technology and organization are identified, complement them with change management, program management and risk management. Identify the right combinations of initiatives and iterate them to make a more sustainable way forward. Practices most related to Implement & iteratively improvise (PRI-05) are Business model canvas (PRA-07) and Value proposition canvas (PRA-12). Business model canvas (PRA-07), an effective one-page representation of the enterprise after the fact of transformation and Value proposition canvas (PRA-12), useful tool for articulating and demonstrating the value going forward.

*Table 5.8  
Design Grid for Design Thinking in IT Transformation Consulting*

<b>Design thinking principle</b>	<b>PRI-01 Human centered design</b>	<b>PRI-02 Embrace ambiguity &amp; diversity</b>	<b>PRI-03 Openness to radical collaboration</b>	<b>PRI-04 Co-create impactful solutions</b>	<b>PRI-05 Implement &amp; iteratively improvise</b>
<b>Design thinking practice</b>					
PRA-01 Empathy maps	CSA	UC			
PRA-02 User personas		UC			
PRA-03 How might we	CSA TSD				
PRA-04 Storyboarding					
PRA-05 Interviewing techniques					
PRA-06 Brainstorming				A&F	

<b>Design thinking principle</b>	<b>Design thinking practice</b>	PRI-01 Human centered design	PRI-02 Embrace ambiguity & diversity	PRI-03 Openness to radical collaboration	PRI-04 Co-create impactful solutions	PRI-05 Implement & iteratively improvise
PRA-07 Business model canvas	TSD					R&R
PRA-08 Journey maps						
PRA-09 Affinity diagrams						
PRA-10 Raskar's hexagon						
PRA-11 Morphological analysis					A&F	
PRA-12 Value proposition canvas						R&R

UC – Understanding Context, CSA – Current State Assessment, TSD – Target State Definition, A&F – Analysis & Findings, R&R – Report & Recommendations.

#### **5.4 Discussion on Findings from Industry Leader Interviews**

Leaders from the Indian IT industry, were interviewed to get their feedback on findings from survey, outcomes of focus group discussions, plus their own views on the applicability of design thinking in consulting.

On design thinking as an enabler for innovation - in the last 10 years, application development shifted from technology to business areas. Industry saw an evolution of digital product development especially in the Business 2 Consumer (B2C) space. Leading to better focus on customer experience, making the journey enjoyable. Design thinking becomes important in this context and is a useful tool, when known personas are involved in the Target state definition. Known personas and known needs, Design

thinking works perfectly. Known needs but unknown personas the adoption is neutral. However, design thinking falls short, if the personas and needs are both unknown.

On adoption of design thinking in India - awareness multiplied in the last five years, adoption is high in the digital products space, where design thinking is experimented even for day-to-day activities.

On applicability of design thinking to consulting - challenging because of variation in scope and increased levels of ambiguity. In regular projects, there is a defined scope and the objective is to deliver against that scope. This equation is not necessarily true in case of consulting. Design thinking brings in the outside-in perspective and joins the dots. The more complex the problem, the greater the need for design thinking. Application is higher in IT Strategy consulting and IT Architecture consulting. Understanding emotions of a engagement, capturing creativity, these aspects of design thinking helps in consulting, here it is taken as a definitive tool by practitioners who have a personal preference.

On findings from survey (refer Section 4.2) – by and large survey findings are on expected lines. Awareness of design thinking awareness, expected at around 75%. While the principle of Human centered design (PRI-01) found highest relevance across consulting types, industry leaders expected Embrace ambiguity & diversity (PRI-02) and Openness to radical collaboration (PRI-03) to be on par. Likewise, expected Co-create impactful solutions (PRI-04) to find relevance even in Understanding context. Interestingly, Implement & iteratively improvise (PRI-05) found increased relevance as the consulting engagement progressed. In terms of practices, design thinking is people

oriented, reflected in the higher values of Empathy maps and User personas. Practices in general, have a lower rating in Report & recommendations phase. On consulting types, IT Strategy consulting, IT Architecture consulting found greater applicability for design thinking, as they are much more closer to management consulting. The remaining consulting types are more of a systems integration play as opposed to strategy consulting.

On outcomes of focus group discussions (refer Section 5.3) – the conceptual framework was much appreciated. Executives felt that the Design grid's of each consulting types is perfect and could very well serve as an accelerator for practitioners to apply design thinking in consulting.

On limitations of design thinking in consulting - principles like Human centered design (PRI-01) need to time to be understood and used appropriately. In product development, a good design is visible and gratifying, in consulting there is no such instant gratification.

On opportunities for design thinking in consulting - design thinking in IT Strategy consulting is well known. Clients expect usage of design thinking. Not so widely used in other consulting types. Greater opportunity to use in articulating value proposition. IT Strategy consulting practitioners should document their design thinking best practices in a playbook, which can then be further leveraged for other consulting types. In fact, design thinking as a learning module should also be adopted by academia as early as possible. Design thinking reveals where the gaps are in the practitioners mindset. In particular, the practices that are unknown to consulting fraternity in India. Whatever have been used, find out where, and how much value they generated.

On opportunities for consulting practitioners – consider the top three design thinking principles in terms of relevance to consulting types (refer Table 4.8), they are Human centered design (PRI-01) in IT Process consulting, Embrace ambiguity & diversity (PRI-02) in IT Strategy consulting and Co-create impactful solutions (PRI-04) in IT Architecture consulting. Likewise the top three practices in terms of relevance to consulting types (refer Table 4.11), they are Value proposition canvas (PRA-12), Interviewing techniques (PRA-05) and Brainstorming (PRA-06) all in IT Strategy consulting. This insight is a good input to consulting practitioners in the Indian information technology industry to learn and grow.

On opportunities for consulting firms – consider the bottom three design thinking principles in terms of relevance to consulting types (refer Table 4.8), they are Human centered design (PRI-01) in IT Infrastructure consulting, IT Portfolio management and Embrace ambiguity & diversity (PRI-02) in IT Infrastructure consulting. Likewise the bottom three practices in terms of relevance to consulting types (refer Table 4.11), they are Affinity diagrams (PRA-09), Empathy maps (PRA-01) and Raskar’s hexagon (PRA-10) all in IT Infrastructure consulting. This insight is a good input to consulting firms in the Indian information technology industry to create learning modules to bridge the skill gaps.

## **5.5 Conclusion**

This chapter presented findings from analysis of survey data, proceedings of focus group discussions, complemented with opinion of industry leaders on analysis and their own insights on applicability of design thinking in consulting.



Discussions also, were along the same themes of participant profile and subject specific data along consulting capability, design thinking awareness, design thinking principles and design thinking practices. More than 80% of the respondents - have a post-graduate or higher degree, more than 15 years of working experience. Consulting experience however, was evenly distributed. Collectively, the participant profile indicates a respondent set that is rich in education, experience and consulting. Consulting capability is above 'Competent' in almost all consulting types, except for IT Infrastructure consulting. Design thinking awareness is above the median. Design thinking principles and practices have found good applicability to consulting phases and consulting types. Proceedings from focus group discussions were evaluated to arrive the most relevant principle and then two practices related to the specific principle. In cases, where there were no clear choices, survey data / reasearcher's judgement were taken into consideration.

As a final step in the research, leaders from the Indian IT industry, were interviewed to get their feedback on findings from survey, outcomes of focus group discussions, plus their own views on the applicability of design thinking in consulting. Key insights from these interviews - design thinking is evolving as a key enabler for innovation. Awareness multiplied in the last five years. However, adoption in consulting is challenging because of variation in scope and increased levels of ambiguity. Findings from survey, were along expected lines. Executives felt that the Design grid's of each consulting types is perfect and could very well serve as an accelerator for practitioners to apply design thinking in consulting, thereby making the conceptual framework credible.

## CHAPTER VI: SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

### **6.1 Summary**

Design thinking in products is widely prevalent, design thinking in services is evolving. Though there have been many studies on application of design thinking in product development, and to some extent improving efficiency in services, there has not been much research focused on design thinking in consulting. The purpose of the current study was to provide a comprehensive review of design thinking as applied to business and development of a conceptual framework that can be applied to consulting.

The main question of the research study was to explore, evaluate and extrapolate how design thinking can be applied to consulting in the information technology industry in India. Research results comprising of - findings from survey of practitioners to observations from focus group discussions with experts and validation of the same from interviews with industry leaders, confirmed that design thinking can be applied to consulting.

In the Design grid for design thinking in consulting (refer Table 6.1), it is amply evident that all of the five design thinking principles and the twelve design thinking practices have found applicability in all the eight consulting types and across the five consulting phases, proving validity of the conceptual framework.

*Table 6.1  
Design Grid for Design Thinking in Consulting*

Consulting types	Consulting phases									
	Understanding context		Curent state assessment		Target state definition		Analysis & findings		Report & recommendatioSNS	
	Principle	Practice	Principle	Practice	Principle	Practice	Principle	Practice	Principle	Practice
IT Strategy consulting	PRI-01	PRA-01 PRA-02	PRI-02	PRA-04 PRA-05	PRI-02	PRA-03 PRA-07	PRI-04	PRA-06 PRA-09	PRI-05	PRA-08 PRA-12
IT Architecture consulting	PRI-02	PRA-02 PRA-05	PRI-02	PRA-05 PRA-07	PRI-01	PRA-03 PRA-08	PRI-04	PRA-06 PRA-11	PRI-05	PRA-04 PRA-12
IT Portfolio management	PRI-01	PRA-01 PRA-02	PRI-01	PRA-05 PRA-08	PRI-04	PRA-10 PRA-11	PRI-04	PRA-06 PRA-11	PRI-01	PRA-08 PRA-12
IT Process consulting	PRI-01	PRA-01 PRA-02	PRI-02	PRA-07 PRA-09	PRI-04	PRA-03 PRA-06	PRI-03	PRA-06 PRA-08	PRI-05	PRA-07 PRA-12
IT Governance consulting	PRI-01	PRA-01 PRA-02	PRI-02	PRA-05 PRA-08	PRI-01	PRA-02 PRA-08	PRI-04	PRA-06 PRA-08	PRI-05	PRA-07 PRA-12
IT Infrastructure consulting	PRI-02	PRA-01 PRA-02	PRI-03	PRA-04 PRA-05	PRI-01	PRA-04 PRA-07	PRI-04	PRA-06 PRA-08	PRI-05	PRA-04 PRA-12

Consulting types	Consulting phases									
	Understanding context		Curent state assessment		Target state definition		Analysis & findings		Report & recommendatiosns	
	Principle	Practice	Principle	Practice	Principle	Practice	Principle	Practice	Principle	Practice
IT Outsourcing consulting	PRI-02	PRA-01 PRA-02	PRI-03	PRA-05 PRA-08	PRI-01	PRA-06 PRA-07	PRI-04	PRA-06 PRA-11	PRI-05	PRA-07 PRA-12
IT Transformation consulting	PRI-02	PRA-01 PRA-02	PRI-01	PRA-01 PRA-03	PRI-01	PRA-03 PRA-07	PRI-04	PRA-06 PRA-11	PRI-05	PRA-07 PRA-12

PRI-01 - Human centered design, PRI-02 - Embrace ambiguity & diversity, PRI-03 - Openness to radical collaboration, PRI-04 - Co-create impactful Solutions, PRI-05 - Implement & iteratively improvise  
PRA-01 - Empathy maps, PRA-02 - User personas, PRA-03 - How might we, PRA-04 - Storyboarding, PRA-05 - Interviewing techniques, PRA-06 - Brainstorming, PRA-07 - Business model canvas, PRA-08 - Journey maps, PRA-09 - Affinity diagrams, PRA-10 - Raskar's hexagon, PRA-11 - Morphological analysis, PRA-12 - Value proposition canvas

The research covered IT Strategy consulting, IT Architecture consulting, IT Portfolio management, IT Process consulting, IT Governance consulting, IT Infrastructure consulting, IT Outsourcing consulting and IT Transformation consulting (see Section 2.2.6). In the Indian IT industry, consulting engagements are executed over five phases, starting with Understanding context and moving onto Current state assessment, Target state definition, Analysis & findings and Report & recommendations

(see Section 2.2.6). A majority of the survey respondents demonstrated a consulting capability of 'Competent' or above (see Table 4.4 and Figure 5.4).

Research indicated a very high level of awareness of design thinking. The percentages of respondents considering 'Medium level of awareness' and above is a solid 90% plus. Such a strong reading of awareness of design thinking, coupled with competent consulting capability, raises the confidence of survey participants responses to alignment of design thinking principles and practices to consulting types and consulting phases (see Table 4.5 and Figure 5.5).

Principles are the fundamental ideas or general rules that are true regardless of the circumstances, they are the propositions that serve as the foundation for design thinking. Design thinking principles (see Table 4.6) in co-relation to consulting phases (see Table 4.7 and Figure 5.6) and to consulting types (see Table 4.8 and Figure 5.7) yielded a mixed response amongst survey participants. However, the focus group discussions demonstrated the applicability of all the principles to consulting types and consulting phases.

Practices on the other hand are the actions, tools, techniques or process by which the expected outcomes of the principles are achieved. Design thinking practices (see Table 4.9) in co-relation to consulting phases (see Table 4.10 and Figure 5.8) and to consulting types (see Table 4.11 and Figure 5.9) yielded a mixed response amongst survey participants. However, the focus group discussions demonstrated the applicability of all the practices to consulting types and consulting phases.

Design grid, the conceptual framework defined by the researcher is a matrix of design thinking principles and practices. Design grid's (see Table 5.1 to Table 5.8) populated through focus group discussions, facilitated by the researcher is yet another proof of the applicability of design thinking to consulting. Interesting to note, is the careful selection of principle relevant to the specific consulting type and specific consulting phase first then selecting related practices. Each of the five principles, found applicability in all the consulting phases and across consulting types, depending on nature of the consulting engagement, this demonstrates the breadth of usage of the design thinking principles. Similarly, the twelve practices found relevance to all the five principles across consulting phases and consulting types, demonstrating depth of usage of design thinking practices. Taken together the Design grid, turned out to be a force-multiplier for application of design thinking to consulting.

### **6.1.1 Limitations**

The present research demonstrated applicability of design thinking to classical consulting types only and did not cover contemporary consulting types like Digital transformation consulting, Cyber security consulting, consulting around advanced technologies like Artificial intelligence, Machine learning, IoT or Environmental, Social and Governance (ESG) consulting. In terms of design thinking practices, the list did not include Agile tools and techniques. Amongst the consulting types, IT Infrastructure consulting did not yield the best results, potentially because of its low consulting capability. Practice's selected, happened to be familiar ones as opposed to best suited, in some instances.

## **6.2 Implications**

In a world where enterprises would be embracing digital technologies - there is a need for innovative methods and as end-users would be demanding enhanced customer experiences - human centricity is essential. Design thinking as a method score's on both these counts and Design grid as a conceptual framework has proved applicability of design thinking to consulting. Practitioners can now produce solutions that generate new meanings and activate diverse elements like cognitive, emotional and sensory, involved in the human experience, by understanding cultures, experiences, emotions, thoughts and behavior to provide inspiration to not just succeed but also sustain.

Clients also stand to gain, as design thinking encourages problems to be seen from the end customer's perspective as in the client's organization or the extended customer (i.e.) the client's customer – the consumer's, point of view, to co-create solutions in a collaborative manner and implement recommendations iteratively.

Furthermore, the novelty of the research lies in design thinking discovering a new field for application - consulting services in IT industry and consulting practitioners / practices in IT can now deliver advisory services leveraging a contemporary technique like design thinking.

## **6.3 Recommendations for Future Research**

Future researchers may wish to undertake studies to explore further on some of the limitations cited in the previous section:

A study to extend design thinking in consulting to Digital transformation, Cyber security and / or advanced technologies like Artificial intelligence, Machine learning, IoT or Environmental, Social and Governance (ESG) Consulting.

A study on Agile tools and techniques that can be leveraged as design thinking practices, their relation to design thinking principles and applicability to design thinking in consulting.

A study on the design thinking outcomes based on adoption of Design grid for the specific consulting type.

#### **6.4 Conclusion**

Design thinking in products is widely prevalent, design thinking in services is evolving. Though there have been many studies on application of design thinking in product development, and to some extent improving efficiency in services, there has not been much research focused on design thinking in consulting. The purpose of the current study was to provide a comprehensive review of design thinking as applied to business and development of a conceptual framework that can be applied to consulting.

The literature review, provided insights into the consulting types and consulting phases as prevalent in the Indian IT industry. Consulting types included IT Strategy consulting, IT Architecture consulting, Portfolio management, IT Process consulting, IT Governance consulting, IT Infrastructure consulting, IT Outsourcing consulting and IT Transformation consulting. In execution, consulting engagements start with; Understanding context and move onto Current state assessment, Target state definition, Analysis & findings and conclude with Report & recommendations. Design thinking as a



concept started in the 1950s, evolving from industrial design to product design to user centered design. Nigel Cross defines design thinking as, “Design thinking in its simplest form is thinking as a designer would”. Review of literature on design thinking in business, provided for a baseline list of design thinking principles - Human centered design, Embrace ambiguity & diversity, Openness to radical collaboration, Co-create impactful solutions and Implement & iteratively improvise. Associated design thinking Practices are Empathy maps, User personas, How might we, Storyboarding, Interviewing techniques, Brainstorming, Business model Canvas, Journey maps, Affinity diagrams, Raskar’s hexagon, Morphological analysis and Value proposition canvas. Literature on design thinking in consulting was limited, however available material helped define a conceptual framework, in the form of a Design Grid – a matrix of design thinking principles and design thinking practices.

Research design process comprised of three stages. Starting with survey of consulting practitioners to focus group discussions to semi-structured interviews of industry leaders. Survey was administered via Google forms to randomly selected practitioners through social media platforms like LinkedIN and emails to personal and professional contacts. The questionnaire comprised of five themes – participant profile, consulting capability, design thinking awareness, applicability of design thinking principles and practices to consulting types and consulting phases. A total 252 practitioners participated in the survey.

Results from survey were tabulated on the above five themes. Practitioners who volunteered to be participate further, and having a consulting capability of ‘Proficient’ or

higher in specific consulting type's and 'High' or 'Complete' level of awareness of design thinking were invited to focus group discussions for that specific consulting type. In all, eight focus group discussions were conducted, one for each consulting type with about four to six participants, each session lasting for about 45 minutes.

Discussions revealed a very strong consulting capability and a high level of awareness of design thinking. Therefore, the choice of relevant principles and related practices for each consulting phase in the respective consulting type focus group discussions gained credibility. Thus, meaningful Design grids could be created for each of the consulting types. Findings from survey and Design grids from focus group discussions were validated with industry leaders. Key insights from these interviews - design thinking is evolving as a key enabler for innovation. Awareness multiplied in the last five years. However, adoption in consulting is challenging because of variation in scope and increased levels of ambiguity. Findings from survey, were along expected lines. Executives felt that the Design grid's of each consulting type is perfect and could very well serve as an accelerator for practitioners to apply design thinking in consulting.

In conclusion, the consolidated Design grid, demonstrated that design thinking principles and practices can be applied to all consulting types across all consulting phases. Therefore, the primary objective of this research may be considered achieved; the researcher hopes that this conceptual framework will continue to serve as a force-multiplier for consulting practitioners in the information technology in India.

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APPENDIX A

SURVEY - COVER LETTER



AN EMPIRICAL STUDY ON THE APPLICATION OF DESIGN THINKING IN  
CONSULTING IN INFORMATION TECHNOLOGY INDUSTRY IN INDIA

Greetings!

Mohan Kancharla here, pursuing my Doctor of Business Administration at Swiss School of Business and Management, inviting you to participate in my Research study.

The Survey comprises of five parts, each with a clearly defined objective and guidelines to assist in answering the questions. Requesting for 20 minutes of your time. Please answer all questions as honestly as possible and complete the survey by 30th June 2022. Your answers will be completely confidential, participation is strictly voluntary, and you may refuse to participate at any time. By answering the survey, you are providing consent and are agreeing to participate in this study.

Thank you for taking the time to assist me in my educational endeavours. If you have any questions regarding the survey, please contact me at [mohankancharla64@gmail.com](mailto:mohankancharla64@gmail.com) or [mohan@ssbm.ch](mailto:mohan@ssbm.ch).

Best Regards,

Mohan Kancharla

DBA Student

APPENDIX B

SURVEY - QUESTIONNAIRE



AN EMPIRICAL STUDY ON THE APPLICATION OF DESIGN THINKING IN  
CONSULTING IN INFORMATION TECHNOLOGY INDUSTRY IN INDIA

**Part 1 – Participant Profile (Mandatory)**

<b>1. Name</b>					
<b>2. eMail ID</b>					
<b>3. Education</b>	<b>Graduate</b>	<b>Post-graduate</b>	<b>Doctorate</b>		
<b>4. Total experience</b>	<b>&lt;5 Years</b>	<b>6 – 10 Years</b>	<b>11 – 15 Years</b>	<b>16 –20 Years</b>	<b>&gt;20 Years</b>
<b>5. Consulting experience</b>	<b>&lt;5 Years</b>	<b>6 – 10 Years</b>	<b>11 – 15 Years</b>	<b>16 –20 Years</b>	<b>&gt;20 Years</b>

**Part 2 – Consulting Capability (Mandatory)**

IT Consulting services are advisory services that help clients assess different technology strategies and in doing so, align their technology strategy with their business and corporate strategy. IT Consulting services provide strategic directions to customers IT initiatives.

The objective of this section is, to understand your expertise across the different types of consulting engagements based on your experience.

**6. Please indicate your expertise in the following consulting types. Please select all that apply.**

<b>Consulting type</b>	<b>Novice</b>	<b>Beginner</b>	<b>Competent</b>	<b>Proficient</b>	<b>Expert</b>
IT Strategy consulting					
IT Architecture consulting					
IT Portfolio management					
IT Process consulting					
IT Governance consulting					
IT Infrastructure consulting					



<b>Consulting type</b>	<b>Novice</b>	<b>Beginner</b>	<b>Competent</b>	<b>Proficient</b>	<b>Expert</b>
IT Outsourcing consulting					
IT Transformation consulting					

### **Part 3 – Design Thinking Awareness (Mandatory)**

Design thinking 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.

The objective of this section is, to understand your degree of familiarity with design thinking in general.

#### **7. Please indicate your degree of familiarity with design thinking.**

<b>Design thinking awareness</b>	<b>Lack of awareness</b>	<b>Low level of awareness</b>	<b>Medium level of awareness</b>	<b>High level of awareness</b>	<b>Completely aware</b>

#### **Part 4 – Design Thinking Principles (Mandatory)**

Principles are fundamental ideas or general rules that are true regardless of the circumstances, propositions that serve as the foundation for design thinking.

Human centered design – The principle is applied primarily to understanding end users of the enterprise and its ecosystem rather than restricting to the echelon of executives.

Embrace ambiguity & diversity - ambiguity could stem from the way in which the context or drivers are interpreted. One way to address this dilemma is to embrace ambiguity by accepting the dichotomy and reaching out to a diverse set of stakeholders.

Openness to radical collaboration - reaching out to as diverse a stakeholder set as possible to gain insights that are far reaching in understanding the true context of the engagement.

Co-create impactful solutions - rather than articulating solutions in isolation if all stakeholders are brought together to co-create the solution, chances of it being impactful are higher.

Implement & iteratively improvise - in design thinking the notion of continuous improvement is in-built and is inherent in every stage. Implementing here, implies testing the solution in closed door conference room pilots.

The objective of this section is, for you to identify the design thinking principles relevant to each of the consulting phases and also for each of the consulting types.

**8. Please indicate from your consulting experience, which of the following design thinking principles are applicable to the different consulting phases. Please select all that apply.**

<b>Consulting phase</b>  <b>Design thinking principle</b>	Understanding context	Current state assessment	Target state definition	Analysis & findings	Report & recommendations
Human centered design					
Embrace ambiguity & diversity					
Openness to radical collaboration					
Co-create impactful solutions					
Implement & iteratively improvise					

**9. Please indicate from your consulting experience, which of the following design thinking principles are applicable to the different consulting types. Please select all that apply (Scroll right to view all consulting types).**

<b>Consulting type</b>	<b>IT Strategy consulting</b>	<b>IT Architecture consulting</b>	<b>IT Portfolio management</b>	<b>IT Process consulting</b>	<b>IT Governance consulting</b>	<b>IT Infrastructure consulting</b>	<b>IT Outsourcing consulting</b>	<b>IT Transformation consulting</b>
Human centered design								
Embrace ambiguity & diversity								
Openness to radical collaboration								
Co-create impactful solutions								
Implement &								

<b>Consulting type</b>								
<b>Design thinking principle</b>	IT Strategy consulting	IT Architecture consulting	IT Portfolio management	IT Process consulting	IT Governance consulting	IT Infrastructure consulting	IT Outsourcing consulting	IT Transformation consulting
iteratively improvise								

### Part 5 – Design Thinking Practices (Mandatory)

Practices are tools or techniques by which the expected outcomes of the principles are achieved.

Empathy maps - empathy maps, provide a simple 2x2 visual of what the stakeholders are saying, doing, thinking and what are their feelings, their pains and gains.

User personas - user personas help in building up the right profile to understand the context. The profile here, can be an individual or a business entity.

How might we - the crux of this practice is to pre-fix ‘How Might We’ (HMW) in every collaboration to every discussion.

Storyboarding - storyboards can help the client stakeholders visualize how things are going to change and by what timeframes.

Interviewing techniques – the most effective way to connecting with the stakeholders to capture the voice of the customer.

Brainstorming - facilitates ideas on understanding context, defining target state and analyzing gaps to find solutions in a collaborative way with active participation from diverse stakeholders.

Business model canvas – a visual chart that captures the key building blocks of a business – customer segments, channels, partnerships, relationships, activities, resources, costs, revenues

Journey maps - a story-based approach to communicate the user's experience with a product or service.

Affinity diagrams - fosters embracing diverse views and ideas without quantifying them, but organizing them into groups or themes based on their relationships.

Raskar's hexagon - propagates the notion of starting with an idea or solution and validating the same across multiple dimensions.

Morphological analysis – a creative problem-solving technique for systematically structuring and exploring all possible solutions.

Value proposition canvas – visual depicting fitment between customer profile (jobs, pains, gains) and value maps (products or services, pain relievers, gain creators).

The objective of this section is, for you to identify the design thinking practices relevant to each of the consulting phases and also for each of the consulting types.

**10. Please indicate from your consulting experience, which of the following design thinking practices are applicable to the different consulting phases. Please select all that apply.**

<b>Consulting phase</b>	<b>Understanding context</b>	<b>Current state assessment</b>	<b>Target state definition</b>	<b>Analysis &amp; findings</b>	<b>Report &amp; recommendations</b>
<b>Design thinking practice</b>					
Empathy maps					
User personas					
How might We					
Storyboarding					
Interviewing techniques					
Brainstorming					
Business model canvas					
Journey maps					
Affinity diagrams					
Raskar's Hexagon					
Morphological analysis					
Value proposition canvas					

**11. Please indicate from your consulting experience, which of the following design thinking practices are applicable to the different consulting types. Please select all that apply (Scroll right to view all consulting types).**

<b>Design thinking practice</b>	<b>IT Strategy consulting</b>	<b>IT Architecture consulting</b>	<b>IT Portfolio management</b>	<b>IT Process consulting</b>	<b>IT Governance consulting</b>	<b>IT Infrastructure consulting</b>	<b>IT Outsourcing consulting</b>	<b>IT Transformation consulting</b>
Empathy maps								
User personas								
How might We								
Storyboarding								
Interviewing techniques								
Brainstorming								
Business model canvas								
Journey maps								
Affinity diagrams								
Raskar's Hexagon								



<b>Consulting type</b>								
<b>Design thinking practice</b>	IT Strategy consulting	IT Architecture consulting	IT Portfolio management	IT Process consulting	IT Governance consulting	IT Infrastructure consulting	IT Outsourcing consulting	IT Transformation consulting
Morphological analysis								
Value proposition canvas								

**12. Please indicate your willingness to participate in a brainstorming session to explore application of design thinking in consulting.**

<b>Willing to participate in the Brainstorming session</b>	<b>Yes</b>	<b>No</b>

All Information will be kept Strictly Confidential.

**Thank You for Your Participation.**

APPENDIX C

FOCUS GROUP DISCUSSION - PROCESS



AN EMPIRICAL STUDY ON THE APPLICATION OF DESIGN THINKING IN  
CONSULTING IN INFORMATION TECHNOLOGY INDUSTRY IN INDIA

**Design Grid – The Conceptual Framework for Design Thinking in Consulting**

In this focus group discussion, we will co-create the Design grid for a specific consulting type, across all the consulting phases by following the steps below:

1. Select one design thinking principle that is most relevant in your opinion for this consulting type for Understanding context
2. Select two design thinking practices that is most related to the chosen design thinking principle and relevant to this consulting type for Understanding context
3. Repeat Step 1 and Step 2 for the remaining consulting phases.

<b>Design thinking principle</b>	Understanding context	Current state assessment	Target state definition	Analysis & findings	Report & recommendations
<b>Design thinking practice</b>					
Empathy maps					
User personas					

<b>Design thinking principle</b>	<b>Understanding context</b>	<b>Current state assessment</b>	<b>Target state definition</b>	<b>Analysis &amp; findings</b>	<b>Report &amp; recommendations</b>
<b>Design thinking practice</b>					
How might We					
Storyboarding					
Interviewing techniques					
Brainstorming					
Business model canvas					
Journey maps					
Affinity diagrams					
Raskar's Hexagon					
Morphological analysis					
Value proposition canvas					

All Information will be kept Strictly Confidential.

**Thank You for Your Participation.**

## APPENDIX D

### FOCUS GROUP DISCUSSION - PROCEEDINGS



#### AN EMPIRICAL STUDY ON THE APPLICATION OF DESIGN THINKING IN CONSULTING IN INFORMATION TECHNOLOGY INDUSTRY IN INDIA

Focus group discussions were conducted for each consulting type as per the process defined in Appendix C. Each session, moderated by the researcher, comprised of about 4 – 6 experts from the respective consulting types. Each focus group discussion was for about 45 minutes; brainstorming on relevant principles for each consulting phase and related practices. This appendix, describes the complete proceedings of all 8 focus group discussions, highlighting every participant's choice or principles and practices, including rationale for their specific selection.

#### **Design Grid for Design Thinking in IT Strategy Consulting**

IT Strategy consulting - is defining the roadmap for IT, that is aligned to business, elaborating upon the direction for the organization, architecture and infrastructure.

##### 1. Understanding context

Participants expressed Human centered design (PRI-01), Embrace ambiguity & diversity (PRI-02) and Openness to radical collaboration (PRI-03) as the principles that are most relevant for IT Strategy consulting in the Understanding context phase.

Human centered design (PRI-01), as it enables a good connect with stakeholders and thereby making a good first impression. Takes the focus away from the scope of engagement to human elements like expectations and key performance indicators of stakeholders.

Empathy maps (PRA-01) and User personas (PRA-02) were the practices related to Human centered design (PRI-01). Empathy maps (PRA-01), depict the pains / gains of all stakeholders, they capture each stakeholders' emotions and expectations, all of which are essential to Understanding context. User personas (PRA-02), help in creating stakeholder profiles and capturing all their expectations.

Embracing ambiguity & diversity (PRI-02), as the objective of the phase is to being open to understanding the needs and pain points of a diverse set of stakeholders which would help bring in different perspectives to the context and defining the real problem statement.

Coincidentally, Empathy maps (PRA-01) was the practice found to be related to Embrace ambiguity & diversity (PRI-02) also, for similar reasons, to clearly capture each stakeholders' emotions and expectations. Interviewing techniques (PRA-05), was the other practice found to be related to Embrace ambiguity & diversity (PRI-02), as it can help in connecting the stakeholders and extracting the obvious as well as non-obvious facts and information. Care must be taken that the interviewer doesn't go in with a pre-set mindset or with a solution in hand. Interviews should be open ended, yet non-intrusive making

the interviewee's talk more on the various aspects of the problem including the emotional side of things which are critical to understanding context.

Openness to radical collaboration (PRI-03), it's important to reach out to every stakeholder in business to understand true context of engagement and people's experiences and motivations as well as the physical environment they exist in. This will help gain deeper personal understanding of the issues involved.

Practices related to Openness to radical collaboration (PRI-03) are Empathy maps (PRA-01) and Interviewing techniques (PRA-05). The former helps in observing, engaging, and empathizing with people experiencing the problem and the latter helps in connecting to each stakeholder / expert to learn about the area of concern.

## 2. Current state assessment

In Current state assessment, Embrace ambiguity & diversity (PRI-02) and Openness to radical collaboration (PRI-03) are the most relevant principles for IT Strategy consulting.

Embrace ambiguity & diversity (PRI-02), as the phase requires practitioner's to be open and know all dimensions of the context. To understand the as-is state of the engagement, it's important to embrace the ambiguity & connecting to diverse set of stakeholders.

Practices related to Embrace ambiguity & diversity (PRI-02) are, Storyboarding (PRA-04) and Interviewing techniques (PRA-05).

Storyboarding (PRA-04) develops stories based on scenarios, they are a good way to structure the current state understanding and explain to all the involved and validate the understandings, helps create a high-level graphical representation of the current state of the engagement, and what all activities needs to be done. Interviewing techniques (PRA-05) are a good tool to capture all the details from user groups to get a full-picture of the current state and will help in connecting to each stakeholder to understand the current state in terms of pain and gains.

Openness to radical collaboration (PRI-03), as reaching out to a diverse set of stakeholders can help understand the current scenario from the perspective of each of them, which in turn helps to get a more holistic picture of the current state.

Practices related to Openness to radical collaboration (PRI-03) are Empathy maps (PRA-01) and Storyboarding (PRA-04), Interviewing techniques (PRA-05) once again. Empathy maps (PRA-01) clearly capture each stakeholders' emotions and expectations along the entire journey which is key in understanding the current state. Storyboarding (PRA-04), as its effective to get a holistic view of the current state. Interviewing techniques (PRA-05), as it's an effective way to capture detailed information about the current state and processes.

### 3. Target state definition

Participants choice of principles for Target state definition for IT Strategy consulting were, Human centered design (PRI-01) and Embrace ambiguity & diversity (PRI-02).

Human centered design (PRI-01) can help us creating a target state which is human centered and makes life simpler for all stakeholders.

Practices related to Human centered design (PRI-01) are How might we (PRA-03) and Storyboarding (PRA-04). How might we (PRA-03) can help in articulating ways to address the current pain points and design a viable target state. Storyboarding (PRA-04), like in assessing current state, storyboarding can help design a target state as well.

Embrace Ambiguity & diversity (PRI-02), for designing the target state it's important to explore uncharted territories with respect to people, process and technology. Consulting through embracing ambiguity & diversity develops a clear vision for target state whilst keeping the current state in mind. Target state necessitates exploring hitherto unexplored areas and would require practitioners to embrace ambiguity & diversity.

Practices related to Embrace ambiguity & diversity (PRI-02) are How might we (PRA-03), Storyboarding (PRA-04) and Business model canvas (PRA-07). How might we (PRA-03), asking every stakeholder and discussing with respect to the current state of the engagement is one way to define the target state, helps in articulating ways to address the current pain points and design a



viable target state. Storyboarding (PRA-04), like in current state the target state can also have similar storyboards which can help in comparing current and target states to make sure of the intended change. Business model canvas (PRA-07) is a very useful tool to map the entire organization in a simple graphic way, helps visualize the various stakeholders and the value stream which would enable a better definition of the target state.

#### 4. Analysis & findings

In Analysis & findings, the top two relevant Principles are Openness to radical collaboration (PRI-03) and Co-create impactful solutions (PRI-04).

Openness to radical collaboration (PRI-03), to be open to exploring all solution options, as analysis of information gathered and coming out with key findings would require extensive collaboration with SME's.

Practices related to Openness to radical collaboration (PRI-03) are

Brainstorming (PRA-06) and Affinity diagrams (PRA-09). Brainstorming (PRA-06) helps come up with as many ideas as possible encouraging free thinking, ideas getting bounced is a very good tool for analysis and findings,

will lead to new ideas and options to arrive at the target state. Affinity

Diagrams (PRA-09) is a complementing tool for Brainstorming (PRA-06), as this will help organize all the ideas / options in to logical themes / groups so that nothing is lost during this process.

Co-create impactful solutions (PRI-04), ideas shared through a collaborative process can help create new concepts, solutions, services, and products leading to effective and viable solutions.

Practices related to Co-create impactful solutions (PRI-04) are Brainstorming (PRA-06), Affinity diagrams (PRA-09) once again and also Morphological analysis (PRA-11). Brainstorming (PRA-06), collaborating with a diverse set of people would involve different interpretations of the data gathered and how it comes together to form a desired solution. Affinity diagrams (PRA-09) help in collecting ideas from a diverse set of stakeholders and grouping them into themes / buckets to check possible trends for target state. Morphological analysis (PRA-11) helps in creating logically related workflows from an analytical perspective.

#### 5. Report & recommendations

In Report & recommendations, Co-create impactful solutions (PRI-04) and Implement & iteratively improvise (PRI-05) came up as the relevant principle's for IT Strategy consulting. In the recommendation phase it is important to create a roadmap with small steps towards the achievement of the larger goal. A 'Fail fast' mindset is important as there could be facts that may not have been uncovered in the process which only come in when the solution is actually shared with end users.

Co-create impactful solutions (PRI-04), each of the themes from analysis and findings is taken and evaluate for business sense and financial viability to create the impact for each solution option recommended.

Practices related to Co-create impactful solutions (PRI-04) are Journey maps (PRA-08) and Value proposition canvas (PRA-12). Journey maps (PRA-08) better explains each solution, helps visualize the solution in the target state.

Value proposition canvas (PRA-12), for each of the solution option it is important that value is calculated and articulated to demonstrate the potential value that could be generated, both of which are possible through this framework.

Implement & iteratively improvise (PRI-05), this approach can help fine tune recommendations and ensure sustainable business value in the new solution, enables practitioners to bring their ideas to life and visualize the outcomes. Also, facilitates quick decision making through proof of concept or pilot projects where required.

Practices related to Implement & iteratively improvise (PRI-05) are Storyboarding (PRA-04), Journey maps (PRA-08) and Value proposition canvas (PRA-12). Storyboarding (PRA-04) helps in visualizing how things will change in the new way of working. Journey Maps (PRA-08) help in creating and compiling the series of user action items into a timeline to achieve the target state. Value proposition canvas (PRA-12) shows how the

new solutions can add value to the business, an important framework to ensure that the solution is positioned rightly around the end users' needs.

### **Design Grid for Design Thinking in IT Architecture Consulting**

IT Architecture consulting - is defining the business architecture and deriving the application, information and technical architectures that are modular as well as coupled.

#### 1. Understanding context

Embrace ambiguity & diversity (PRI-02) was the principle found to be most relevant to a majority of participants for Understanding context in IT Architecture consulting, except for one participant who picked Co-create impactful solutions (PRI-04).

Embrace ambiguity & diversity (PRI-02), for IT Architecture consulting it is important to understand the context from various scenarios even though it is vague at times. Architecture is not very open so practitioners have to reach out to multiple corners in the organization, getting to know what matters to which layer in the organization.

The practices related to Embrace ambiguity & diversity (PRI-02) are found to be many; User personas (PRA-02), Storyboarding (PRA-04), Interviewing techniques (PRA-05), Business model canvas (PRA-07) and Journey maps (PRA-08).

User Personas (PRA-02) to capture all the user personas in the context.

Storyboarding (PRA-04), as it is a very useful tool to understand the architecture context, including how the system should behave. Interviewing

techniques (PRA-05), interactions with stakeholders through workshops.

Business model canvas (PRA-07) to understand how the business works.

Journey Maps (PRA-08) to understand the way each stakeholder interacts with various products and services.

Co-create impactful solutions (PRI-04), going one step behind, something like choosing a car vs. a transport solution; not decided on a car but develop a transportation solution.

Related practice is once again Storyboarding (PRA-04), to present how the future state vis a vis current state looks like upfront and plan things.

## 2. Current state assessment

Practices relevant to Current state assessment for IT Architecture t are

Embrace ambiguity & diversity (PRI-02) and Openness to radical collaboration (PRI-03).

Embrace ambiguity & diversity (PRI-02), for architecture it is important to understand the current state of affairs from various angles both obvious and ambiguous. Even though current state is existing, half the people don't know what is going on in the background, hence multiple assumptions may have to be made.

Practices related to Embrace ambiguity & diversity (PRI-02) are

Storyboarding (PRA-04), Interviewing techniques (PRA-05), Business model canvas (PRA-07). Storyboarding (PRA-04), to create the additional stories from the interviews or modify the stories captured in the context. Interviewing

techniques (PRA-05), once the user personas are in place, this technique can be used to gather all information of the current state. Business model canvas (PRA-07) can be used as a surrogate to a reference architecture. Useful to whiteboard and do a maturity assessment, helps to capture current state, in a way to depict it back to the stakeholders.

Openness to radical collaboration (PRI-03) enables seeking information from all stakeholders.

Practices related to Openness to radical collaboration (PRI-03) are Business model canvas (PRA-07) and Journey maps (PRA-08). The former to help to map existing operations of the enterprise and the later to articulate in detail how things happen.

### 3. Target state definition

In IT Architecture consulting the principle's relevant to Target state definition are Human centered design (PRI-01) and Openness to radical collaboration (PRI-03).

Human centered design (PRI-01), since the target state needs to align to a set of stakeholders keeping the human factor in mind. It's all about sowing the seeds of future, new designs and new ways of working, the effort needs to be collaborative.

Practices related to Human centered design (PRI-01) in Target state definition are How might we (PRA-03), Journey maps (PRA-08), Affinity diagrams (PRA-09) and Raskar's (PRA-10). How might we (PRA-03) to create an

impact. Journey maps (PRA-08) to capture the changes of internal and external stakeholder's journeys. Affinity diagram (PRA-09) to factor in some amount of consolidation. Raskers hexagon (PRA-10), since it happens to be a great analytical tool to predict outcomes or the target state.

Openness to radical collaboration (PRI-03) an important principle when deciding the target state of an enterprise, as it is imperative that all inputs from various stakeholders are captured.

In terms of practices, related ones are Business model canvas (PRA-07) and Journey maps (PRA-08). Business model canvas (PRA-07) is very effective to map the target state of the enterprise across all nine perspectives. Journey maps (PRA-08) represent how the system behaves for a particular use case and also what the stakeholder touchpoints are within the system.

#### 4. Analysis & findings

Embrace ambiguity & diversity (PRI-02) and Co-create impactful solutions (PRI-04) are the principles relevant to IT Architecture consulting in Analysis & findings phase.

Embrace ambiguity & diversity (PRI-02), analysis is not always sacrosanct, may have to live with exceptions and assumptions.

Related practices are Raskar's hexagon (PRA-10) and Morphological analysis (PRA-11) once again. Raskar's hexagon (PRA-10), to predict outcomes with various variables. Morphological analysis (PRA-11) to establish correlations and derive relations.

Co-create impactful solutions (PRI-04), this is a critical phase where solutions are evolved for target state and hence, impactful solutions can be created with interested parties who have a stake.

Related practices are Brainstorming (PRA-06) and Morphological analysis (PRA-11). Brainstorming (PRA-06), many ideas are generated through brainstorming, many solutions are also created when used in a structured way such as six thinking hats and lateral thinking. Morphological analysis (PRA-11), very useful tool to select the solution option from many available solutions generated from brainstorming.

#### 5. Report & recommendations

In IT Architecture consulting, the relevant principles for Report & recommendations are Openness to radical collaboration (PRI-03) and Implement & iteratively improvise (PRI-05).

Openness to radical collaboration (PRI-03), to do something radical, boundaries have to be broken. Highlight the collaborators in recommendations to make them successful.

Practices related to Openness to radical collaboration (PRI-03) are Journey maps (PRA-08) and Value proposition canvas (PRA-12). Journey maps (PRA-08) to visualize the future state, how things will be or what steps are to be taken to achieve future from current. Value proposition canvas (PRA-12) to understand why a particular recommendation was made and what its value would be.



Implement & iteratively improvise (PRI-05), once the solution options are identified, prototype them out through conference room pilots, see the results and fine tune recommendations.

The related practices are Storyboarding (PRA-04), Business model canvas (PRA-07), Journey maps (PRA-08) and Value proposition canvas (PRA-12). Storyboarding (PRA-04) helps visualize how things will be in the future state. Business model canvas (PRA-07) for an effective representation of the enterprise after the fact of the solution implementation. Journey maps (PRA-08) to view future state of things and steps to be taken to move from current from future. Value proposition canvas (PRA-12) a very useful tool for articulating and demonstrating the value from the solutions. Can also serve as a framework for prioritizing recommendations.

### **Design Grid for Design Thinking in IT Portfolio Management**

IT Portfolio management - is rationalization of application, consolidation of infrastructure and optimization of investments targeted towards operational excellence.

#### **1. Understanding context**

In Portfolio management, for Understanding context the relevant principles are Human centered design (PRI-01) and Embrace ambiguity & diversity (PRI-02).

Human centered design (PRI-01), in order to understand the expectations of the stakeholders, which could be related to some important emotions with

regard to their respective application portfolio's. Helps understand their current as well as future needs.

Related practices are Empathy maps (PRA-01), User personas (PRA-02) and Business model canvas (PRA-07). Empathy maps (PRA-01) capture the emotional aspects of the stakeholder's expectations and requirements, which are very essential for the balancing the portfolio. User personas (PRA-02) are critical to get all the involved stakeholders and ensure none are missed out.

Business model canvas (PRA-07) to get a holistic view of the portfolio.

Embrace ambiguity & diversity (PRI-02), because the portfolio may have different initiatives from different streams and may need alignment from different stakeholders.

Related practices are Empathy maps (PRA-01) and User personas (PRA-02).

The former to understand the pains and gains of stakeholders and the later to understand needs of various stakeholders.

## 2. Current state assessment

Human centered design (PRI-01) and Embrace ambiguity & diversity (PRI-02) are the relevant principles for IT Portfolio management in Current state assessment too.

Human centered design (PRI-01), is keeping humans at the core, the core of design thinking becomes relevant when centricity is put as the most important part of the whole engagement.

Practices related to Human centered design (PRI-01) in the context of IT Portfolio management in Current state assessment are Interviewing techniques (PRA-05) and Journey maps (PRA-08). Interviewing techniques (PRA-05) help to extract information from various corners and understand the details. Journey maps (PRA-08) articulates in detail how things happen.

Embrace ambiguity & diversity (PRI-02), for Current state assessment it is required to explore uncharted areas to have the right mix of the portfolio allocations.

Practices related to Embrace ambiguity & diversity (PRI-02) are Business model canvas (PRA-07) and Affinity diagrams (PRA-09). Business model canvas (PRA-07) clearly plots the business in context in the nine functional areas to divide the portfolio. Affinity diagrams (PRA-09) help in organizing the data into themes for better understating of the current state.

### 3. Target state definition

In Target state definition, the relevant principles for IT Portfolio management are Co-create impactful solutions (PRI-04) and Implement & iteratively improvise (PRI-05).

Co-create impactful solutions (PRI-04), portfolio design needs to be co-created so that it is not biased.

Practices related to Co-create impactful solutions (PRI-04) are How might we (PRA-03), Business model canvas (PRA-07), Raskar's hexagon (PRA-10) and Morphological analysis (PRA-11). How might we (PRA-03), a tool that is

very useful to create ideas on the portfolio alignment and design. Business model canvas (PRA-07) for the target state helps understand the value the target state design can bring with the changes. Raskar's hexagon (PRA-10), Morphological analysis (PRA-11) are both analytical / ideation tools which help establish synergies to cross analyze various viewpoints.

Implement & iteratively improvise (PRI-05) to refine the solution and prioritize more effectively. Practices would be Brainstorming (PRA-06) an effective ideation tool and Business model canvas (PRA-07) to demonstrate the business value.

#### 4. Analysis & findings

In IT Portfolio management, the relevant principles for Analysis & findings are Embrace ambiguity & diversity (PRI-02) and Openness to radical collaboration (PRI-03).

Embrace ambiguity & diversity (PRI-02) in order to explore multiple viewpoints of multiple stakeholders.

Practices related to Embrace ambiguity & diversity (PRI-02) are, How might we (PRA-03) to help solve the pain points of stakeholders and Brainstorming (PRA-06) to explore ways to solve existing pain points.

Openness to radical collaboration (PRI-03), for the analysis it is required to collaborate with diverse stakeholders to get all the perspectives for the portfolio.

Related practices are Brainstorming (PRA-06) and Affinity diagrams (PRA-09). Brainstorming (PRA-06) to generate a lot of ideas for portfolio balancing. Affinity diagrams (PRA-09) to organize the ideas generated in brainstorming to themes or groups which are very much required for portfolio groupings.

#### 5. Report & recommendations

Principles relevant for Report & recommendations are Human centered design (PRI-01), Co-create impactful solutions (PRI-04) and Implement & iteratively improvise (PRI-05).

Human centered design (PRI-01) as a principle is essential as it is at the core of design thinking.

Related practices are Journey maps (PRA-08) and Value proposition canvas (PRA-12). Journey maps (PRA-08) to visualize how things will be in future. Value proposition canvas (PRA-12) tie's up with the benefits of How might we (PRA-03) statements of the previous phase and helps visualize the future and associated benefits.

Co-create impactful solutions (PRI-04) through conference room pilots.

Related practices are Journey maps (PRA-08) to demonstrate the value and changes going forward. Value proposition canvas (PRA-12) to attach business value to the initiatives.

Lastly, Implement & iteratively improvise (PRI-05) based on the requirements and expectations.

Related practices are Business model canvas (PRA-07) and Value proposition canvas (PRA-12). The former to effectively depict the newly designed portfolio and the later used to articulate the value from the newly designed portfolio.

### **Design Grid for Design Thinking in IT Process Consulting**

IT Process consulting - is providing directions for improving the maturity of business and / or IT processes through continuous improvement and optimization.

#### 1. Understanding context

In Understanding context for IT Process consulting the relevant principle was found to be Human centered design (PRI-01), Embrace ambiguity & diversity (PRI-02) and Openness to radical collaboration (PRI-03).

Human centered design (PRI-01) as emotions too play a role. In order to best understand the context, it is important to listen to the people and understand their expectations (not only the top echelons).

Related practices are Empathy maps (PRA-01), User personas (PRA-02), Interviewing techniques (PRA-05) and Journey maps (PRA-08).

Empathy maps (PRA-01) capture the emotional aspects of the stakeholders' expectations and requirements, which are very essential for the understating the context for process consulting. This will help in understanding the pains of these personas and to design the key performance indicators of processes.

User personas (PRA-02) to understand the stakeholders for whom the

processes are being revisited. They are critical to get all the involved stakeholders and ensure none are missed out. Each will have a different profile with associated expectations.

Interviewing techniques (PRA-05) help to capture the voice of the customer in a systematic. Journey maps (PRA-08) can also be considered here to capture the current process, its behavior and use the same practice in the target state/ analysis to see the changes to the journey and its value.

Embrace ambiguity & diversity (PRI-02) many a time, clients are not able to articulate context resulting in conflicting expectations.

Practices related to Embrace ambiguity & diversity (PRI-02) are, Brainstorming (PRA-06) and Affinity diagrams (PRA-09). The former to evaluate the conflicting needs and the later to group for easier resolution. Additionally, Openness to radical collaboration (PRI-03) was cited as a relevant principle. Process consulting engagements are a two-way street, requiring collaboration between client and consultant.

Empathy maps (PRA-01) and Journey maps (PRA-08) are the related practices. The former to understand the core of ask and the later to assess current and future journeys.

## 2. Current state assessment

The relevant principles for Current state assessment are Human centered design (PRI-01) and Embrace ambiguity & diversity (PRI-02).

Human centered design (PRI-01), important to understand what is happening currently with regard to human processes, including the primary drivers for change.

Empathy maps (PRA-01) and User personas (PRA-02) are the practices related to Human centered design (PRI-01). Empathy maps (PRA-01) to capture requirements stated and implied and relate them to the User personas (PRA-02) captured in Understanding context.

Embrace ambiguity & diversity (PRI-02) in today's context, many of the situations cannot be described in very clear terms. What is important is to understand the boundaries broadly (they can be porous) and focus on a good understanding. These can still be ambiguous.

Related practices are User personas (PRA-02), Interviewing techniques (PRA-05), Business model canvas (PRA-07), Journey maps (PRA-08) and Affinity diagrams (PRA-09). User personas (PRA-02) to get an idea of the current state processes are accomplishing. Interviewing techniques (PRA-05) to get a clear picture of the current state processes. Business model canvas (PRA-07), as a visual tool this helps to paint the multiple dimensions involved in understanding the context across the nine dimensions of the enterprise. This adds richness to the current state and might help in resolving some of the ambiguities. Journey maps (PRA-08) help to capture the experience with the current state and adds richness to the qualification of current state. Affinity



diagrams (PRA-09), helps in organizing the data into themes for better understating of the current state.

### 3. Target state definition

Human centered design (PRI-01), Openness to radical collaboration (PRI-03) and Co-create impactful solutions (PRI-04) were the chosen relevant principles for IT Process consulting in Target state definition.

Human centered design (PRI-01) to ensure end-state processes are human centric, hence the choice of Empathy maps (PRA-01) as a related practice. Openness to radical collaboration (PRI-03), often target state is defined very closed to certain stakeholders with a limited boundary. In reality, this state requires an openness to embrace the uncharted territory.

Related practices are How might we (PRA-03) and Raskar's hexagon (PRA10). How might we (PRA-03), defines the experience one anticipates upon reaching the target state, can serve as useful tool to define that state and will help to arrive at solutions later. Raskar's hexagon (PRA10) takes the target state one by one and ensure it is defined or validated across multiple dimensions.

Co-create impactful solutions (PRI-04), is a very relevant principle for the target process design. Process needs to be co-created so that all the key aspects are captures, incorporates all the best practices and know-how. Helps in designing and visualizing the end-state.

Related practices are How might we (PRA-03), Storyboarding (PRA-04), Brainstorming (PRA-06) and Business model canvas (PRA-07). How might we (PRA-03) tool can be very useful to create ideas on the key performance and key result area indicators. Storyboarding (PRA-04) to visualize the end-state processes. Brainstorming (PRA-06) in line with the principle to design the end-state processes. Business model canvas (PRA-07) for the target state helps understand the value the target state design brings with its changes.

#### 4. Analysis & findings

In Analysis & findings for IT Process consulting participants chose Openness to radical collaboration (PRI-03) and Co-create impactful solutions (PRI-04) as the most relevant Principles.

Openness to radical collaboration (PRI-03) analysis is always grey, hence the need to collaborate with diverse stakeholders to get all the perspectives for inclusiveness.

The related practices however ended up to be many, Empathy maps (PRA-01), User personas (PRA-02), Interviewing techniques (PRA-05), Brainstorming (PRA-06), Journey maps (PRA-08) and Affinity diagrams (PRA-09). Empathy maps (PRA-01) and User personas (PRA-02) to ensure analysis of processes along human centricity and findings to be relevant to all stakeholders. Interviewing techniques (PRA-05) to validate findings and provide for correction. Brainstorming (PRA-06) helps generate a lot of ideas for process design, key performance indicators and calculations. Journey maps

(PRA-08) can be used effectively to demonstrate the process changes / new process, its effect on the current working and the value it brings. Affinity diagrams (PRA-09) to verify validity of findings.

Co-create impactful solutions (PRI-04) analysis should qualify the areas that need to be changed (or impacted) in order to reach the target state. This principle will help to do a focused analysis.

Related practices are Affinity diagrams (PRA-09) and Morphological analysis (PRA-11). The ideas generated in Target state definition can be grouped into themes or buckets to concentrate on the required dimensions using Affinity diagrams (PRA-09). Morphological analysis (PRA-11) a divergent thinking is required in order to generate multiple solutions that require different type of analysis.

#### 5. Report & recommendations

Principles relevant to IT Process consulting for Report & recommendations are, Co-create impactful solutions (PRI-04) and Implement & iteratively improvise (PRI-05).

Co-create impactful solutions (PRI-04), iteratively interacting with a larger team.

Related practices are Business model canvas (PRA-07) and Value proposition canvas (PRA-12), reasoning similar to above.

Implement & iteratively improvise (PRI-05), process changes are very difficult to embrace, hence an iterative implementation can be an effective

approach. Recommendations need to evolve that fit the organization's culture, context and future.

Practices related to Implement & iteratively improvise (PRI-05) are, Business model canvas (PRA-07), Raskar's hexagon (PRI-10) and Value proposition canvas (PRA-12). Business model canvas (PRA-07) to effectively depict organization of the newly designed process, to visualize where they fit in and to verify completeness of transformation from current to future. Raskar's hexagon (PRI-10) the idea is validated across dimensions and evaluated further. Then, refinements are made. This suits the iterative development of the findings. Value proposition canvas (PRA-12) can be used to articulate the value from the newly designed process areas and processes.

### **Design Grid for Design Thinking in IT Governance Consulting**

IT Governance consulting - is defining the governance structures, mechanisms, processes and measures that would best enable IT to support the business.

#### **1. Understanding context**

In IT Governance consulting for Understanding context, Human centered design (PRI-01) was the unanimous choice as the relevant principle.

Human centered design (PRI-01), in IT Governance consulting it is important to understand, the context from personal key performance indicators of key stakeholders and the impact of non-compliance to critical requirements.

Governance is all about the human working together as per the company objectives.

Practices related to Human centered design (PRI-01) here are, Empathy maps (PRA-01), User personas (PRA-02) and Interviewing techniques (PRA-05).

Empathy maps (PRA-01) is an excellent tool to understand the human aspects, requirements for governance, it gives for each stakeholder pains, gains, their thought process, emotions and how the stakeholders interact with various products and services. User personas (PRA-02) to understand the nature of stakeholders, for governance it is important to capture all the user personas in the ecosystem. Lastly, Interviewing techniques (PRA-05) to capture the needs of stakeholders.

## 2. Current state assessment

Human centered design (PRI-01) and Embrace ambiguity & diversity (PRI-02) were the most relevant principles for IT Governance consulting in Current state assessment.

Human centered design (PRI-01) to understand from the end customer perspective.

Related practices are User personas (PRA-02) and Interviewing techniques (PRA-05). User personas (PRA-02) to better understand the nature of the customer and their specific needs. Interviewing techniques (PRA-05) to discover the pain points and their role in governance.

Embrace ambiguity & diversity (PRI-02), for governance it is important to seek information from all corners in order to understand the current state of affairs from various angles both obvious and ambiguous.

Related practices are Storyboarding (PRA-04), Interviewing techniques (PRA-05) and Journey maps (PRA-08). Storyboarding (PRA-04) helps in creating use cases for the scenarios where governance is required or is missing.

Interviewing techniques (PRA-05) once the user personas in place from the previous consulting phase, this technique can be used to gather all the information of the current state - details of stakeholders needs, roles and responsibilities. Journey maps (PRA-08) help articulate in detail how stakeholders think and behave.

### 3. Target state definition

The relevant principles for Target state definition are Human centered design (PRI-01) and Co-create impactful solutions (PRI-04).

Human centered design (PRI-01), an important principle when deciding on the target state of an enterprise. Captures inputs from various stakeholders, including their expectations.

Practices related to Human centered design (PRI-01) are Empathy maps (PRA-01), User personas (PRA-02), Business model canvas (PRA-07), Journey maps (PRA-08) and Raskar's hexagon (PRA-10). Empathy maps (PRA-01) to capture the pains and gains of internal and external stakeholders and co-relate them with user personas. User personas (PRA-02), things will

change a lot for internal and external stakeholders, therefore it is important to know their personas and their journeys. Business model canvas (PRA-07), an effective tool to map the target state of the enterprise across the nine perspectives. Journey maps (PRA-08) an effective tool to map the target state, represents how the system behaves for a particular use case and also what a stakeholder touchpoint is to the system. Raskar's hexagon (PRA-10) a great analytical tool to predict outcomes.

Co-create impactful solutions (PRI-04), so that we establish the synergies right from the onset.

Practices related to Co-create impactful solutions (PRI-04) are Storyboarding (PRA-04) and Business model canvas (PRA-07). The former to articulate the business views and key performance indicators and the later to articulate the target state.

#### 4. Analysis & findings

The relevant principles for IT Governance consulting in Analysis & findings are Human centered design (PRI-01), Embrace ambiguity & diversity and Co-create impactful solutions (PRI-04).

Human centered design (PRI-01) to ensure the solutions found are human centric.

Practices related to Human centered design (PRI-01) are Business model canvas (PRA-07) and Journey maps (PRA-08). Business model canvas (PRA-07), to validate findings and their impact across the nine building blocks.

Journey maps (PRA-08) an effective tool to predict outcomes with various variables.

Embrace ambiguity & diversity, to deal with multiple findings, points of view.

Practice related to Embrace ambiguity & diversity (PRI-02) are Business model canvas (PRA-07) and Raskar's hexagon (PRA-10). Business model canvas (PRA-07) to visualize alignment of the solution to the enterprise.

Raskar's hexagon (PRA-10) is an effective tool, to analyze a situation or to predict outcomes with various variables.

Co-create impactful solutions (PRI-04), this is a critical phase where solutions are evolved for target state and hence, impactful structures and mechanisms can be created with interested parties who have a stake.

Practices relevant to Co-create impactful solutions (PRI-04) are Brainstorming (PRA-06) and Journey maps (PRA-08). Brainstorming (PRA-06), as many ideas can be generated using this practice, helps to be complemented with six thinking hats and lateral thinking. Journey maps (PRA-08) to so see if my design covered all the mechanisms and required governance structures are in place.

#### 5. Report & recommendations

In Report & recommendations, the principles relevant for IT Governance consulting are Human centered design (PRI-01) and Implement & iteratively improvise (PRI-05).



Human centered design (PRI-01), critical for solutions that are to be created with multiple stakeholders.

Practices relevant to Human centered design (PRI-01) are Morphological analysis (PRA-11) and Value proposition canvas (PRA-12). Morphological analysis (PRA-11) to pick the right solution to go with and Value proposition canvas (PRA-12) to demonstrate the value going forward.

Implement & iteratively improvise (PRI-05), once the structures and mechanisms are developed, these can be tried out to see the results. Here all facts and solutions are available, the need is to find the right combinations to go forward with, hence consider implementing iteratively.

Practices relevant to Implement & iteratively improvise (PRI-05) are Storyboarding (PRA-04), Business model canvas (PRA-07) and Value proposition canvas (PRA-12). Storyboarding (PRA-04) to help visualize how things will be in the future. Business model canvas (PRA-07), an effective representation of the enterprise after implementation of governance structures and mechanisms. Value proposition canvas (PRA-12) to demonstrate the value going forward.

### **Design Grid for Design Thinking in IT Infrastructure Consulting**

IT Infrastructure consulting - is optimizing the utilization infrastructure ecosystem, comprising of data center, end-user computing, help desk, service management plus investments.

## 1. Understanding context

The principles relevant for IT Infrastructure consulting in Understanding context are Embrace ambiguity & diversity (PRI-02) and Openness to radical collaboration (PRI-03).

Embrace ambiguity & diversity (PRI-02), in Understanding context the practitioner does not have view of all the elements. It is critical to understand both the obvious reasons for transformation as well as the not so obvious, there could be some vague requirements / key performance indicators hidden that needs to be understood (for e.g., cost, performance, capital expenditure).

Practices related to Embrace ambiguity & diversity (PRI-02) are Empathy maps (PRA-01), User personas (PRA-02), Brainstorming (PRA-06), Business model canvas (PRA-07) and Journey maps (PRA-08). Empathy maps (PRA-01) an excellent tool to understand the human aspects, requirements for transformation, it gives the for each stakeholder pains, gains, ones thought process and emotions. User personas (PRA-02), for transformation it is important to capture all the user personas in the eco system.

Openness to radical collaboration (PRI-03) to understand the current needs from business and IT perspective as well as long term goals, from infrastructure perspective.

Practices related to Openness to radical collaboration (PRI-03) are Storyboarding (PRA-04) and Interviewing techniques (PRA-05). The former

is an effective way to gain deep insight into the context and the later helps in creating the use cases for infrastructure services.

## 2. Current state assessment

The principles relevant for IT Infrastructure consulting in Current state assessment are Embrace ambiguity & diversity (PRI-02) and Openness to radical collaboration (PRI-03).

Embrace ambiguity & diversity (PRI-02) helps to understand the current state from various aspects and from various stakeholders and their needs and competencies. Related practice is Storyboarding (PRA-04).

Openness to radical collaboration (PRI-03) need to collaborate in the absence of real information, may need to get details from vendors or partners.

Practices related to Openness to radical collaboration (PRI-03) are How might we (PRA-03), Storyboarding (PRA-04) and Interviewing techniques (PRA-05). How might we (PRA-03) prefixing to get real data. Storyboarding (PRA-04) helps in creating the use cases for infrastructure services. Interviewing techniques (PRA-05), using personas from previous phase this technique can be leveraged to gather information of current state.

## 3. Target state definition

In Target state definition, Human centered design (PRI-01) was unanimously the most relevant Principle.

Human centered design (PRI-01) an important principle when deciding the target state of an enterprise, it is imperative we capture the inputs from various stakeholders. Infrastructure plays a key role in enhancing human experience.

Practices related to Human centered design (PRI-01) are Empathy maps (PRA-01), User personas (PRA-02), Storyboarding (PRA-04), Business model canvas (PRA-07) and Journey maps (PRA-08). Empathy maps (PRA-01) helps to define ways to simplify way of working and solving key pain points. User personas (PRA-02) to determine how business could potentially be transformed. Storyboarding (PRA-04) to build target scenarios. Business model canvas (PRA-07) very effective tool to map the target state of the enterprise from the nine perspectives. Journey maps (PRA-08) using journey maps from Current state assessment, see how the changes add value.

#### 4. Analysis & findings

The principles relevant for IT Infrastructure consulting in Analysis & findings are Openness to radical collaboration (PRI-03) and Co-create impactful solutions (PRI-04).

Openness to radical collaboration (PRI-03) to look at all solution alternatives that can bring in value.

Practices related to Openness to radical collaboration (PRI-03) are How might we (PRA-03) and Brainstorming (PRA-06). The former to explore possibilities and the later to discuss viability.

Co-create impactful solutions (PRI-04), this is a critical phase where solutions are evolved for target state and hence, impactful solutions and processes can be developed and deployed with interested parties.

Practices related to Co-create impactful solutions (PRI-04) are Brainstorming (PRA-06) and Journey maps (PRA-08). Brainstorming (PRA-06) many ideas are generated thru brainstorming, many ideas are also created when used in a structured way such as six thinking hats and lateral thinking. Journey maps (PRA-08) can be extended here so see if how target state systems are expected to function.

## 5. Report & recommendations

In Report & recommendations, Implement & iteratively improvise (PRI-05) was unanimously the most relevant Principle.

Implement & iteratively improvise (PRI-05) once the technology solutions and process, structures and mechanisms are developed, they need be tried to check the results.

Practices related to Implement & iteratively improvise (PRI-05) are Storyboarding (PRA-04), Journey maps (PRA-08) and Value proposition canvas (PRA-12). Storyboarding (PRA-04) to demonstrate recommendations to executives. Journey maps (PRA-08) an effective representation of the infrastructure process, high-lighting the before and after effect and the

improvements it brings. Value proposition canvas (PRA-12) useful tool for articulating the value from the solutions.

## **Design Grid for Design Thinking in IT Outsourcing Consulting**

IT Outsourcing consulting - is evaluating the right-selection of a model (shared service vs captive) or location (near-shore vs offshore) or vendor(s) for outsourcing or offshoring.

### 1. Understanding context

The principles relevant for IT Outsourcing consulting in Understanding context are Human centered design (PRI-01) and Embrace ambiguity & diversity (PRI-02).

Human centered design (PRI-01), as outsourcing brings in an element of uncertainty amongst stakeholders.

The practice related to Human centered design (PRI-01) is User personas (PRA-02), for reasons above to define the characteristics of impacted stakeholders.

Embrace ambiguity & diversity (PRI-02), for outsourcing it is not always clear as to what can be outsourced, there is a need to embrace ambiguity to explore various layers in the organization and variety of stakeholders.

Practice relevant to Embrace ambiguity & diversity (PRI-02) are Empathy maps (PRA-01), User personas (PRA-02) and How might we (PRA-03).

Empathy maps (PRA-01), an excellent tool to understand, the human aspects

in terms of requirements for outsourcing, for each stakeholder it gives pains, gains, thoughts, emotions and also understand the way each stakeholder interacts with various products and services. User personas (PRA-02), for outsourcing it is important to capture all the user personas in the eco system. How Might we (PRA-03) to help explore new possibilities that outsourcing brings.

## 2. Current state assessment

Participants unanimously felt Openness to radical collaboration (PRI-03) as the most relevant principle.

Openness to radical collaboration (PRI-03), for outsourcing it is important to understand the current state of affairs from various aspects and from various stakeholders. their needs, competencies specially the ground up view of things.

Related practices are Storyboarding (PRA-04), Interviewing techniques (PRA-05), Business model canvas (PRA-07) and Journey maps (PRA-08).

Storyboarding (PRA-04) helps in creating the use cases for the scenario's where outsourcing governance is required / missing. Interviewing techniques (PRA-05), once we have the user personas in place, this technique can be used to gather all the information of the current state. To understand in detail the stakeholder needs, roles, responsibilities and how work is being done currently including user's value chain. With all the above insights, Business model canvas (PRA-07) can be leveraged to get a holistic view of the partners

and ecosystems within the enterprise. Journey maps (PRA-08) help in visualizing what can be outsourced and what cannot.

### 3. Target state definition

Once again, the unanimous choice of the most relevant principle in Target state definition is Human centered design (PRI-01).

Human centered design (PRI-01), when deciding the target state of an enterprise, it is imperative to capture the inputs from various stakeholders, to touch upon the expectations of the key stakeholders. People are directly impacted, the way of working and the entire environment changes.

Related practices are How might we (PRA-03), Brainstorming (PRA-06), Business model canvas (PRA-07) and Journey maps (PRA-08). How might we (PRA-03), to arrive at some very innovative ideas once the use cases and the key performance indicators of stakeholders have been captured in the previous phases. Brainstorming (PRA-06) an effective tool to discuss, debate and design the target state. Business model canvas (PRA-07) to map the target state of the enterprise from the nine perspectives. Helps compare the current state with the target state in terms of new way of doing business. Journey maps (PRA-08) to visualize the to be journey of stakeholders impacted.

### 4. Analysis & findings

Principles relevant to IT Outsourcing consulting in Analysis & findings phase are Openness to radical collaboration (PRI-03) and Co-create impactful solutions (PRI-04).



Openness to radical collaboration (PRI-03) the closest principle, that encourages abductive, deductive and / or inductive thinking.

Related practice would be Affinity diagrams (PRA-09), to group and analyze above forms of thinking.

Co-create impactful solutions (PRI-04), this is a critical phase where solutions are evolved for target state and hence, impactful technology solutions and processes needs to be developed and deployed with interested parties who have a stake, collaborate to create the best of solutions.

In Co-create impactful solutions (PRI-04), the related practices are Brainstorming (PRA-06), Journey maps (PRA-08), Affinity diagrams (PRA-09) and Morphological analysis (PRA-11). Brainstorming (PRA-06) many ideas are generated, many are also created when used in a structured way such as six thinking hats and lateral thinking. Journey maps (PRA-08) to so see if target state, processes and required governance structures are in place and Affinity diagrams (PRA-09) to build upon the facts and findings from analysis. Morphological analysis (PRA-11), an effective tool to make conclusions from the facts and findings so far.

#### 5. Report & recommendations

The most relevant principles is Implement & iteratively improvise (PRI-05). Implement & iteratively improvise (PRI-05), once the technology solutions, business process and governance structures and mechanisms are developed,

these need to be tried to check the results. Identify the right combinations of initiatives and iterate them to make a more sustainable way forward.

Practices related to Implement & iteratively improvise (PRI-05) are Storyboarding (PRA-04), Business model canvas (PRA-07) and Value proposition canvas (PRA-12). Storyboarding (PRA-04) to visualize how things will be in the future. Business model canvas (PRA-07), an effective representation of the enterprise after the fact of the outsourcing implementation. Value proposition canvas (PRA-12), a useful tool for articulating and demonstrating the value going forward, in case of outsourcing the business value is usually very compelling.

### **Design Grid for Design Thinking in IT Transformation Consulting**

IT Transformation consulting - is enabling the enterprise to realize its vision, through implementation of strategic directions provided for one or more of the consulting segments.

#### **1. Understanding context**

The principles relevant for IT Transformation consulting in Understanding context are Human centered design (PRI-01) and Embrace ambiguity & diversity (PRI-02).

Human centered design (PRI-01), as transformation affects stakeholders at many levels.

The practice related to Human centered design (PRI-01) are Empathy maps (PRA-01) and User personas (PRA-02) to understand the expectation of sponsors and others.

Embrace ambiguity & diversity (PRI-02), in transformation it is critical to interact with a wide variety of stakeholders from business as well as IT and support functions. Transformation requires understanding of both the obvious reasons for transformation as well as the not so obvious, there could be some vague requirements or key performance indicators hidden that unraveled.

Practices relevant to Embrace ambiguity & diversity (PRI-02) are Empathy maps (PRA-01), User personas (PRA-02) and Interviewing techniques (PRA-05). Empathy maps (PRA-01) is an excellent tool to understand, the human aspects, requirements for transformation, it gives the for each stakeholder pains, gains, ones thought process and emotions. Helps understand the way each stakeholder interacts with various products and services. User personas (PRA-02), for transformation it is important to capture all the user personas in the eco system. Interviewing techniques (PRA-05) are an effective way to extract relevant information.

## 2. Current state assessment

Principles relevant to Current state assessment are Human centered design (PRI-01), Embrace ambiguity & diversity (PRI-02) and Openness to radical collaboration (PRI-03).

Human centered design (PRI-01) to get a detailed understand of how things are today and how it impacts various stakeholders.

Related practices are Empathy maps (PRA-01) and How might we (PRA-03). Empathy maps (PRA-01) to understand in detail the stakeholder needs, roles and responsibilities and their pain points. How might we (PRA-03) to understand how can we make a positive change in the way of working of various stakeholders.

Embrace ambiguity & diversity (PRI-02), given the wide scope transformation engagements there is an inherent ambiguity on what needs to be assessed first.

User personas (PRA-02) and Interviewing techniques (PRA-05) are the related practices. User personas (PRA-02) to understand the expectation of key stakeholders and users. Interviewing techniques (PRA-05). important to tailor questionnaires and surveys for different stakeholder groups based on information to be collected and type of stakeholder group.

Openness to radical collaboration (PRI-03), important to understand the current state of affairs from various aspects and from various stakeholders and their needs and competencies. Be it legacy, digital or social transformation, it is very important to collaborate with all the stakeholders to get their point of view.

Related practices are Storyboarding (PRA-04) and Interviewing techniques (PRA-05). Storyboarding (PRA-04) helps in creating the use cases for the scenarios for the transformation. Interviewing techniques (PRA-05), once we

have the user personas in place, we can use this technique to gather all the information of the current state.

### 3. Target state definition

Principles relevant to Target state definition are Human centered design (PRI-01), Openness to radical collaboration (PRI-03) and Co-create impactful solutions (PRI-04).

Human centered design (PRI-01) an important principle when deciding the target state of an enterprise, it is imperative to capture the inputs from various stakeholders and know of their expectations.

Related practices are How might we (PRA-03) and Business model canvas (PRA-07). How might we (PRA-03), can arrive at some unique ideas using this technique, leveraging use cases from current state assessment. Business model canvas (PRA-07) to map the target state of the enterprise from the nine perspectives.

Openness to radical collaboration (PRI-03) to be open to having a broad-based discussion involving a variety of stakeholders and design a solution that is acceptable to all and sustainable at the same time.

Brainstorming (PRA-06) and Business model canvas (PRA-07) are the related practices. The former to design the target state and the later to compare the current state with the target state in terms of new way of doing business.

Co-create impactful solutions (PRI-04), to ensure objectives and expectations are met in the target state.

Storyboarding (PRA-04) and Brainstorming (PRA-06) are the related practices. Storyboarding (PRA-04) to define the big picture and how to get there and Brainstorming (PRA-06) helps generate ideas to enable target state definition.

#### 4. Analysis & findings

Principles relevant to IT Transformation consulting in Analysis & findings phase are Openness to radical collaboration (PRI-03) and Co-create impactful solutions (PRI-04).

Openness to radical collaboration (PRI-03) is the most relevant principle that can help in analyzing the complex requirements of a transformational engagements.

Related practices are Interviewing techniques (PRA-06) and Affinity diagrams (PRA-09). Interviewing techniques (PRA-06) important to tailor questionnaires and surveys for different stakeholder groups based on information to be collected and type of stakeholder group – and analyze the findings accordingly. Affinity diagrams (PRA-09) help clump and organize information to draw out themes and correlated initiatives.

Analysis & findings is a critical phase where solutions are evolved for target state and hence, impactful technology solutions and processes needs to be developed and deployed with interested parties who have a stake, collaborate to create the best of solutions.

In Co-create impactful solutions (PRI-04) the related practices are Brainstorming (PRA-06), Journey maps (PRA-08), Affinity diagrams (PRA-09) and Morphological analysis (PRA-11). Brainstorming (PRA-06), many ideas are generated, many are also created when used in a structured way such as six thinking hats and lateral thinking. Journey maps (PRA-08), to see if target state, processes and required governance structures are in place, Affinity diagrams (PRA-09) to build upon the facts and findings from analysis. Morphological analysis (PRA-11), an effective tool to make conclusions from the facts and findings so far.

#### 5. Report & recommendations

The most relevant Principles is Implement & iteratively improvise (PRI-05). Implement & iteratively improvise (PRI-05) once the technology solutions, business process and governance structures and mechanisms are developed, these need to be tried to check the results. Identify the right combinations of initiatives and iterate them to make a more sustainable way forward.

Practices related to Implement & iteratively improvise (PRI-05) are Storyboarding (PRA-04), Brainstorming (PRA-06), Business model canvas (PRA-07), Affinity diagrams (PRA-09) and Value proposition canvas (PRA-12). Storyboarding (PRA-04) to visualize how things will be in the future. Brainstorming (PRA-06) to generate ideas that can enable recommendations. Business model canvas (PRA-07), an effective one-page representation of the enterprise after the fact of transformation. Affinity diagrams (PRA-09) help

clump and organize information to draw out themes for recommendations.

Value proposition canvas (PRA-12), useful tool for articulating and

demonstrating the value going forward.



APPENDIX E

EXECUTIVE INTERVIEW - INFORMED CONSENT



AN EMPIRICAL STUDY ON THE APPLICATION OF DESIGN THINKING IN  
CONSULTING IN INFORMATION TECHNOLOGY INDUSTRY IN INDIA

I, ..... agree to be part of the focus group / interviewed for the research which will be conducted by ..... a doctorate students at the Swiss School of Business and Management, Geneva, Switzerland.

I certify that I have been told of the confidentiality of information collected for this research and the anonymity of my participation; that I have been given satisfactory answers to my inquiries concerning research procedures and other matters; and that I have been advised that I am free to withdraw my consent and to discontinue participation in the research or activity at any time without prejudice.

I agree to participate in one or more interviews for this research. I understand that such interviews and related materials will be kept completely anonymous and that the results of this study may be published in any form that may serve its best.

I agree that any information obtained from this research may be used in any way thought best for this study.

.....

.....

Signature of Interviewee

Date

## APPENDIX F

### EXECUTIVE INTERVIEW - GUIDE



#### AN EMPIRICAL STUDY ON THE APPLICATION OF DESIGN THINKING IN CONSULTING IN INFORMATION TECHNOLOGY INDUSTRY IN INDIA

Thank you so much for agreeing to participate in this research. As you might recall, I am seeking your expert opinion, on applicability of design thinking to consulting and also your insights on some of the findings from survey, focus group discussions.

The interview will comprise of the following steps:

- A. Introductions
- B. Briefing on the research study and methodology adopted
- C. Explanation of survey questionnaire and format of focus group discussions
- D. Elaboration on findings from survey and focus group discussions
- E. Interview executives to gain their insights on the above.

#### **Opening Questions**

1. What are your views on design thinking as an enabler of innovation?
  - a) *Probe: Scenario in India.*
2. What are your thoughts on adoption of design thinking in India?
  - a) *Probe: Scenario in the IT industry.*
3. In your opinion, can design thinking be applied to IT Consulting?
  - a) *Probe: Degree of adoption.*

### **Survey Findings Based Questions**

1. Share degree of design thinking awareness amongst survey respondents
  - a) *Probe: Is it low, high or on expected lines.*
2. Share relevancy of design thinking principles to consulting phases.
  - a) *Probe: Enquire executive choices.*
3. Share relevancy of design thinking principles to consulting types.
  - a) *Probe: Enquire executive choices.*
4. Share relation of design thinking practices to consulting phases.
  - a) *Probe: Enquire executive choices.*
5. Share relation of design thinking practices to consulting types.
  - a) *Probe: Enquire executive choices.*

### **Focus Group Discussion Based Questions**

1. Share Design Grid for IT Strategy consulting.
  - a) *Probe: Would you agree or disagree? and Why?*
2. Share Design Grid for IT Architecture consulting.
  - a) *Probe: Would you agree or disagree? and Why?*
3. Share Design Grid for IT Portfolio management.
  - a) *Probe: Would you agree or disagree? and Why?*
4. Share Design Grid for IT Process consulting.
  - a) *Probe: Would you agree or disagree? and Why?*
5. Share Design Grid for IT Governance consulting.
  - a) *Probe: Would you agree or disagree? and Why?*

6. Share Design Grid for IT Infrastructure consulting.
  - a) *Probe: Would you agree or disagree? and Why?*
7. Share Design Grid for IT Outsourcing consulting.
  - a) *Probe: Would you agree or disagree? and Why?*
8. Share Design Grid for IT Transformation consulting.
  - a) *Probe: Would you agree or disagree? and Why?*

### **Closing Comments**

1. What are your final thoughts on design thinking, design thinking in consulting?
  - a) *Probe: Potential, Opportunities, Limitations.*

All Information will be kept Strictly Confidential.

**Thank You for Your Participation.**