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# DEEP Design Thinking as a Strategy for Innovation Management

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*Abstract*—**Companies around the world recognize the need to become more innovative in order to stay competitive. Design thinking draws significant attention by practitioners as well as academia as a novel methodology that is potentially helpful for improving innovative outcomes in products, services, or strategies. Innovation management allows the company to respond to emerging opportunities in the recent advanced developments, uses its creativity to introduce new ideas, processes, products, and competitive advantages compared to their competitors. This paper proposes a strategy for combining DEEP design thinking with the process of innovative management to solve wicked problems in the creative economy. Also, the comparative analysis of traditional approach with proposed approach supports the use of DEEP design thinking strategy for integrating design thinking and business thinking for innovation management.**

*Keywords*—**Design thinking (DT), DEEP DT, Innovation management, Wicked problems.**

## I. INTRODUCTION

In the age of digital transformation, the world is undergoing change and the disintegration of the old economy is becoming evident. Organizations around the world are faced with the need to innovate as it recognizes innovativeness as a driving factor for business growth to maintain a competitive advantage in the market and offer exclusive benefits to customers [19]. Proper innovation management helps in customer satisfaction and employee engagement. Also, it brings improvements in generating new business models, a creation of new products, services, and technologies designed for the changing market. Leading research in this area suggest that the key to innovation in business development & management lies within the creative thinking of the design field.

DT is a methodology that teaches individuals new strategies to solve problems and fascinated the importance of both scholarly and practitioner literature because of the applicability of design strategy for promoting innovation across many areas, such as in business [17]. According to [10], wicked problems, so-called complex problems, lacked both definitive formulations and solutions, and were characterized by conditions of high uncertainty. The DT's ability to solve more complex problems has designated it in the business environment as a promising approach for innovation [3].

Understanding how innovation within management can be supported by DT strategy fascinate the interest of business communities. But still, there is lack of focus on specific design thinking strategy for encouraging innovations in a business community with DT methods and tools that could be used by teams of non-designers [1, 2, 8]. For this purpose, the approach has been proposed to use DEEP DT [15] strategy for integrating design thinking and business thinking for innovation management. In conclusion, the paper discusses the comparative analysis of traditional approach and proposed strategy approach and supports utilizing DT methods and tools for innovation management.

The organization of the paper is as follows: Section 2 reviews background information of key concepts with relevant studies; Section 3 analyzes proposed DEEP DT strategy that could be used for innovation management and traditional business design methodology. Section 4 discusses comparison of the DEEP DT method with traditional approach, followed by the conclusions in section 5.

## II. LITERATURE REVIEW

In this section, design thinking and innovation management concepts have been reviewed.

Design thinking draws essentials from the designer's toolkit to integrate people, technology, and the necessities for business success for innovative solutions. According to IDEO, design thinking brings innovation in process, functionality, emotional along with experience. It also allows people who are naive designers to use creative tools to address various challenges [7]. The DT in the innovation process is defined as a system of three overlapping elements such as viability, desirability, and feasibility in terms of the business perspective of DT, the user's perspective, and the technology perspective. Innovation increases when all three perspectives are addressed properly as shown in Figure 1.

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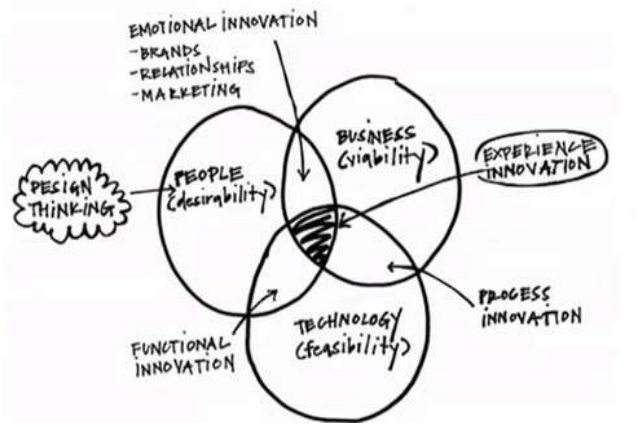


Fig. 1. Design Thinking in Innovation Process

Innovation is the search for the new processes, new products and new organizational structures and procedures [4] for the discovery of commercialization. According to [11], innovation management mainly involves innovation in the business services, the products, brand extensions, or technology and marketing as shown in Figure 2.

A process innovation involves the innovation in the implementation of a new or improved manufacture or delivery method. A product innovation concentrates on the introduction of a product or improved service with respect to its intended uses [11]. A marketing innovation focuses on the implementation of a new marketing method for designing, packaging, pricing, and promotions of the products. Company innovation implements a new organizational method for business practices, internal and external relations in the organization. If there is a support for innovation culture and value for employees feeling, then only innovation management process will be successful.

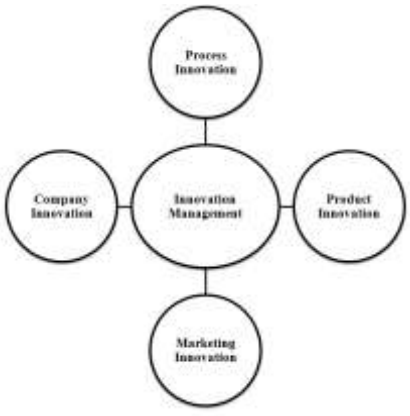


Fig. 2. Innovation management in Business

The innovation management process consists of three phases as given in Figure 3.

- Discovery: Focus on identifying the theme
- Ideas: Gathering ideas for problem statements.
- Execution: Getting fund and creating POC (proof of concept) and market-ready product.

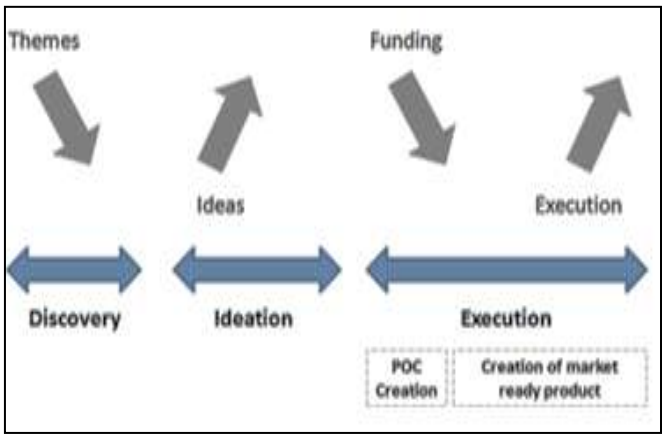


Fig. 3. Innovation management process
[source: Hackerearth Blog]

## III. METHODOLOGY

### *A. Traditional Methods*

**1. Business as a strategy**

In the traditional approach, in most organization, involves the layers of business strategy, design, and innovation, shown in Figure 4.

- Business strategies were mostly developed using the analytic thinking or the strategic planning [18,9,16]. Business strategy depends on design and innovation for achieving the strategies for competitive advantage or customer's experience.
- Design develops some ideas either by modifying existing ones with little changes or coming up with new ones in order to meet those strategies.
- Then apply the designed and developed concrete designs on to innovation for moving the products to market.

In this approach, Business strategies are rather pushy which means that if there is a product, then this strategy will explain why a customer should use it.

The role of design thinking in this approach is limited as only the design what is available at the last stage will be completed, instead of creating new ideas to meet the actual customers' needs, wants and desires. So design thinking is not applied to

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business strategy and innovation and only used in the design phase of this approach.

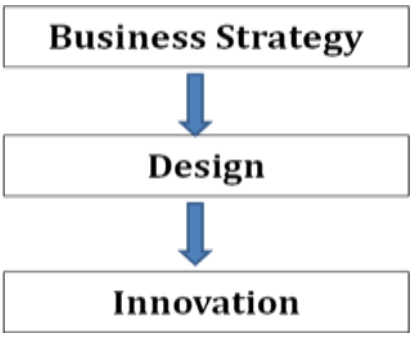


Fig. 4. Traditional approach

According to [6], some strategy problems are the wicked problem which involves stakeholders with their changing priorities over the course of solution implementation. The analytical approaches to strategy will not be able to handle them and only the application of design thinking in business strategy offers a better handle on wicked problems.

**2. Design thinking as a strategy**

In design thinking as a strategic approach shown in Figure 2, design thinking plays an active role both in business strategy and innovation. It uses alternative strategies [21] based on a system's perspective having many stakeholders with an emphasis on users, instead of using analytic thinking for the creation of strategies by the business strategists.

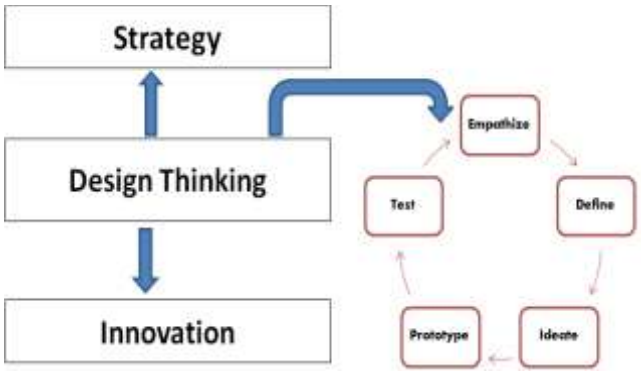


Fig. 5. Design thinking as a Business strategy

There are many activities in the creation of business strategy and design thinking aids in all those activities to make them a reality. In the innovation process also design thinking plays an active role in creating different ideas with an emphasis on the holistic requirements from the beginning to the end of successful innovations and not just at the end of the innovation process [7].

Design thinking promised the delivery of creativity as a new process to the world of business [20]. Most of the companies supported and comfortable with DT which is used as a package for the creativity in a process. It helps the designer to develop their opportunity in the business world. Also, design consultancies which promoted the DT as a process were expecting that significant cultural and organizational change will be produced by this DT process technique.
Even though there are many successes in this strategy, but still there are some failures if the business uses this design thinking as a strategic approach [14]. The reasons are as follows:

- The process of Design Thinking was a framework for the real deliverable as a creativity from the beginning stage till throughout the design strategy process.
- It was uncovered of the conflict, failure, emotions, confusion and looping circularity through phases as a parcel of the creative process while demanding it to the business culture of process,
- These mess along with the process were accepted b some companies for the real innovation took place. But some companies did not accept it, as practitioners of design those companies now acknowledge, the success rate for the DT as a process was low, very low.

***B. DEEP DT as a strategy for an Innovation Management***

The DEEP design thinking process is designed for working in the following phases:

- **D**iscover
- **E**mpathize
- **E**xperiment
- **P**roduce

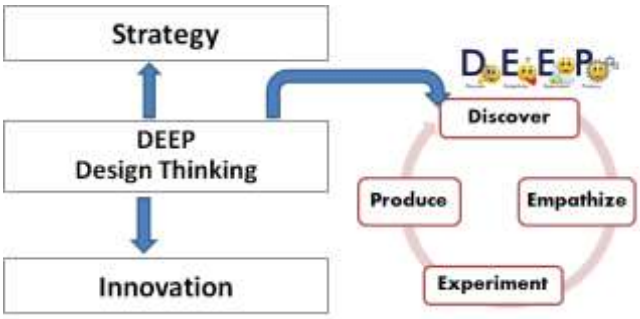


Fig. 6. DEEP Design thinking as a Business strategy

DEEP design thinking is a nonlinear process which mindful to return, pause or restart the phases with the focus of user's needs are at the forefront. In this design strategy, designers can understand their topic or challenge through research, questions, and observations from the user.

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- Discover Phase:

This phase has various methods which help the designers to unpack their topic with the preparation of organization's expectations before engaging with their users.

During this stage, the designer can able to discover :

- ✓ design topic,
- ✓ what's not working,
- ✓ what is curious to them,
- ✓ content to help them understand their topic.

- Empathize Phase:

The designers are empathetic and understand the needs, aka stories, experiences, feelings of the user for their solving problem during this phase. Typically, designers apply methods like need finding, interviewing, role-playing & related empathy for knowing the topic of design thinking challenges. Then the designers synthesize, define, and formulate their understanding after collecting and synthesizing the requirements of the users. Empathizing with the user is an ongoing and iterative process, so the designer has to revisit the user for further information.

- Experiment Phase:

There will be a brainstorming session for defining the actual need of the user. Then rapid ideation of prototyping will be generated with the help of low-resolution, low attachment, recycled material.

- Produce Phase:

During this phase, designers will show the developed prototype to the user without telling of their prototype. By this way, testing will be carried out. User feedbacks are collected and go back to experiment phase if there is any improvement required in the prototype. It focuses on how well the designers have empathized with their user and communicated their solutions. It provides an opportunity for designers to realize how far they have developed through the DEEP design thinking process, evaluate other designers' work, and receive critique and feedback for their own growth & process.

The most important aspect of the DEEP design thinking is the flexing and supporting creativity towards users and their needs.

### *C. Framework of DEEP DT strategy*

This framework provides a holistic view of a system of the systems for the business system design project by considering business Strategy as a problem definition and analysis phase, DEEP design as the main understanding phase of business strategy and innovation phase as an implementation of product design to the market phase.

#### a) Strategy for Business Strategy

Based on the context of the business strategy for an enterprise [9] the business strategy creation process will be based on analytic thinking, abductive thinking, design thinking, or integrative thinking or combination of all of these thinking methods and, also it has been using an incomplete toolkit, in this business context [9]. The strategy for business strategy is all about choosing the right thinking as the first step while preparing the business strategy because the strategy problems are the wicked problems in nature, which are difficult to solve with traditional analytic thinking. So DEEP design thinking will be applicable to this strategy as it starts with discover phase of designers.

#### b) DEEP Design Thinking for Business Strategy

It is about the creation of business strategy by applying the process and methods of DEEP design thinking because it offers a toolkit for business strategies to be created and also provides a case study explaining the process [12].

#### c) DEEP Design Thinking for Design

It is about the creation of the design for designed business strategy by applying the process and methods of DEEP design thinking. The designer will have the expertise to carry out the design of the designed business strategy [13].

#### d) DEEP Design Thinking for Innovation

It is about applying the DEEP design thinking processes, methods and tools for the process of coming up with the innovation for the market, which involves innovation to be applied for the process, product, marketing or company in the designed business strategy of the enterprise [22].

## IV. COMPARISON OF BUSINESS DESIGN STRATEGY VS. DEEP DESIGN THINKING STRATEGY

Table -1 Comparison Results

| | Business Approach | Design Thinking Approach | Proposed DEEP DT Approach |
|---|---|---|---|

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| | | | |
|---|---|---|---|
| **Phases in Framework** | 1. Determine position<br>2. Define strategy<br>3. Build the plan<br>4. Manage performance | 1. Empathize<br>2. define<br>3. Ideation<br>4. Prototype<br>5. Test | 1. Discover<br>2. Empathize<br>3. Experiment<br>4. Produce |
| **Problem Solving Approach** | Formal & Definitive. Relies on statements for "proof". | Iterative. Relies on a "build to think" process with trial and error. | Iterative. Relies on a "build to DEEP think" process dependent on trial and error. |
| **Testing & Validation By** | What customers say: Has qualitative (focus groups) and quantitative (surveys) research. | What customers do: Based on customer feedback and usability testing. | What customers do: Based on customer feedback and usability testing. |
| **Start with** | Market analysis and collective consumer behavior. | Direct consumer observation and HMW (How might we) session. | Designer observe the topic of challenge first and then observe customer. |
| **Completion status** | Completion of strategy phase marks the start of product development phase. | Product development continually evolving with customers. | Product development continually evolving with customers and refine designer's insight with empathy |
| **Focused on** | understanding the use of product by customer. | Need of customer. | Need of customer along with designer's insight. |
| **Tools for showing strategic plan** | Spreadsheets PowerPoint charts/graph | Prototypes, films, and scenarios. | Needfinding, Unpack, Synthesis, Point of View, How Might We, Brainstorming, Iterating, Storytelling |
| **Described through** | Words (often open to interpretation). | Pictorial representations and direct experiences with prototypes. | Pictorial representations and direct experiences with prototypes. |

## V. CONCLUSION

The problems with the traditional approach to business strategy which are mostly analytical thinking based were identified. The proposed DEEP design thinking integration framework has been explained with how it is helping the designer to solve the wicked problems of business strategy in the view of innovation management. The main concepts visualized with the traditional and proposed DEEP design thinking integration framework for enterprises were briefly discussed. The comparison has been done for the traditional approach without design thinking, integration approach with design thinking and proposed DEEP design thinking strategy for creative economy.

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