

ROLE OF DESIGN THINKING AND CREATIVE COGNITION FOR THE GROWTH OF DIGITAL ENTREPRENEURSHIP

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ABSTRACT

Digital Entrepreneurship can be defined as embracing new ventures and the transformation of existing business by creating and using novel digital technologies. On the other hand, Design Thinking is now considered to be one of the effective problem-solving methodology and appropriate for complex business understanding and facilitate innovation. Design thinking tools are well aligned with creative understanding. The study attempted to identify the attributes related to Design Thinking and Creative cognition that can contribute to innovation and understand how these attributes are interrelated. About 30 students responded to some open-ended questions relevant to the objectives. This resulted to creation of a corpus of text or transcripts. Grounded theory in association with Affinity Mapping was applied to identify the attributes from the transcript. Open Coding, Axial Coding and Selective coding under grounded theory facilitated to reveal the underlying attributes from a significantly large corpus of text. The key attribute which evolved through different coding under Grounded theory is Business Model Creation which is linked to all other attributes like Creative Intelligence, Productive Risk Taker, and Navigate through Complexity, Effective Communication, Empathy and Emphasis on Process, Deep User Understanding, and Prediction.

Keywords: *Digital Entrepreneurship, Design Thinking, Creative Cognition, Innovation, Business Model, Grounded Theory, Affinity Diagram*

INTRODUCTION

Digital Entrepreneurship can be defined as embracing 'new ventures and the transformation of existing business by creating and using novel digital technologies. Digital Enterprises are characterized by a high intensity of utilization of new digital technologies (particularly social, mobile, analytics and cloud solutions) to improve business operations, invent new (digital) business models, sharpen business intelligence and engage with customers and stakeholders through new (digital) channels' (Ries, 2011). Not only in India but across the globe Digital Entrepreneurs are dominating Technology start up ecosystem. Technology based entrepreneurship leading to rapid creation of tech start-ups is generating cumulative attention across the world (Subrahmanya, 2017). Tech start-ups are often viewed as important sources of innovation, productivity, growth and employment (World Economic Forum, 2014). They contribute to country's competitiveness through introduction of new product and services (Muller and Rammer, 2012). Ries (2011) in his Lean Start-up Manifesto stated that, "a start-up is a human institution designed to create a new product or service under conditions of extreme Uncertainty". As mentioned by Blank (2013) digital start-ups are ventures that incorporate novel digital technology as a vital component of their business model and consummate matches among producers and consumers. However, this

could not feasibly operate without the internet-enabled platforms. On the other hand, 'Design Thinking' has generated significant attention in business domain and has been proclaimed as a novel problem-solving methodology appropriate for the challenges faced by business organisation while encouraging innovation and growth (Liedtka, 2015). Design thinking tools are well aligned with creative understanding. Literature shows cognitive approaches to Creativity and can be related to the important tasks of entrepreneurs that are generating noble and useful ideas for business ventures. Attention is given to the paradoxical role of knowledge, which can either enhance or inhibit creativity, as well as to the properties of knowledge and a selected set of processes that influence the originality of newly generated ideas (Ward, 2004). Entrepreneurs face many significant challenges, while generating or recognizing ideas that have the potential to be developed into appealing goods or services (Ward, 2004). Generally popular ideas are often a balance between novelty and familiarity: new and different enough to capture consumers' attention, but familiar enough to not be misunderstood or rejected out of hand as too radically different. According to Ward (2004) creative cognition approach provides a theoretical framework for understanding the thought processes involved, it has the potential to serve as guide to more effective idea development. The creative cognition approach views creative ideas as being the natural result of applying basic mental operations to existing

knowledge structures. The originality of a given idea, that is, the balance between its novelty and familiarity, will be determined by the processes employed and the way in which existing knowledge is accessed (Ward, 2004). Therefore, the study aims to explore and reflect on the role of Design Thinking and Creative Cognition in developing and shaping a set of capabilities among young digital entrepreneurs to accelerate their growth.

Research Objectives

The objective of the study is majorly two folded with minor abstraction.

- a) Identify the attributes related to Design Thinking and Creative cognition that can contribute to innovation.
- b) How these attributes are interrelated and can be used to develop a set of capabilities that can facilitate the growth of digital entrepreneurship?

RESEARCH METHODOLOGY

About 28 post graduate students, who are graduate engineers related to startup digital entrepreneurship ecosystem in some form. Their business models are predominantly based on service design and have strong digital intervention related to UX/UI, IoT, AR/VR; Cloud computing, Data Science and Analytics etc. With strong technological domain knowledge, the students are presently pursuing their Master's in Design, which is strongly interdisciplinary. They are trying to harness Design Thinking and Creative Cognition to conceptualize innovative business models in digital platform.

They were asked to answer a set of open-ended questions with detailed explanations. This created a corpus of text data for qualitative exploration through Grounded Theory. Some open-ended questions, which were administered to capture data, were as follows:

- i. How do you think your design education helped you to generate entrepreneurial skills?
- ii. What are the capabilities you feel that you have acquired through this 'Design Thinking Approach' which was not there before?
- iii. Is there any shift in mind set related to your own business model creation? It can be positive or negative shift.
- iv. Do you feel creative intelligence helps someone to be a productive risk taker? Do you see any such change in yourself after entering the field of design?

- v. To what extent do you intend to come up with your own business idea that can contribute to digital start up ecosystem.

Grounded Theory in association with Affinity Diagramming was applied to generate the underlying factors related to Design Thinking and Creative cognition, which can contribute to innovative ideation among Digital Entrepreneur. Grounded theory was first presented by Glaser and Strauss (1967) out of an urgent need in the field of social science research. Grounded Theory is also a suitable approach in generating factors for different constructs (Parry, 2003). Grounded Theory was executed through three stages Open, Axial and Selective coding. Affinity diagram was devised by a Japanese anthropologist Kawakita Jiro in 1960, also known as K-J Method or the affinity chart (Foster, 2010). It is a tool to generate groups of data based on their natural relationship through brainstorming (Foster, 2010).

RESULTS AND DISCUSSION

Grounded Theory emphasizes on the idea of emergence of concepts based on the responses of the respondents. The researcher implemented the specific guidelines as outlined by Corbin and Strauss (1990). Grounded Theory was executed through three stages open, axial and selective coding. Below are some excerpts from the transcript:

• Open Coding

There are several ways to do Open Coding. Here in this study researcher took an initiative to analyze the data line by line. This process of coding is called line-by-line coding which is important to build concepts and categories. Line-by-line coding is a very time consuming and tedious work but at the same time it also helps to build detail structured conceptual data model.

When the researcher was not finding any new concepts but only repeating the existing labels, by that time the researcher stopped further coding. Two examples of excerpts are shown below to explain the process.

Excerpt 1: As an Engineer the researcher has acquired some technical knowledge. But with the help of design education he feels he can implement that knowledge in more creative ways. Design has helped me to think out of the box and the researcher feels it is an important skill for an Entrepreneur. Because a startup can be successful if their idea is unique, something that is never done before.

Open Coding: Primary Labels are marked in Bold- As

an Engineer the researcher has acquired some technical knowledge. But with the help of design education he feels he can implement that technical knowledge in more creative way. Design has helped me to think out of the box and the researcher feels it is an important skill for an Entrepreneur (ability to think out of the box is an important skill for Entrepreneur). Because a startup can be successful if their idea is unique, something that is never done before.

Memo: The researcher identified the above codes from the transcript because the respondent feels that through design education the respondent can *implement technical knowledge in a more creative way and ability to think out of the box is an important skill for Entrepreneur*. Therefore, both are listed under capabilities, which can be achieved through design thinking approach. In this excerpt the respondent also mentioned that development of *unique idea* could be developed through design thinking approach.

Excerpt 2: As a designer the researcher must be cautious and at the same time curious about his surrounding and he must critically ask why, how, what, where etc. to everything that he observe because whatever he observes around is a result of design. The researcher must be cautious about his surrounding so that he can design better to fulfill the requirements of it. He must be cautious about people around him or the people who are taking into consideration while designing something because they are the end users who will be working with it or on it. In his engineering he was never taught to think about end user as a primary aim. That was not their priority. The priority was technical specifications, calculations etc.

Open Coding: Primary Labels are marked in Bold- As a designer the researcher must be cautious and at the same time curious about his surrounding and he must critically ask why, how, what, where etc. to everything that he see because whatever he sees around is a result of design (critical about every possibility around to design better). The researcher must be cautious about his surrounding so that he can design better to fulfill the requirements of it. The researcher must be cautious about people around him or the people who are taking into consideration while designing something because they are the end users who will be working with it or on it (cautious about end users). In his engineering he was never taught to think about end user as a primary aim. That was not their priority. The priority was technical specifications, calculations etc.

Memo: Here the researcher has identified the above

codes because the respondent feels that through this design education the respondent became *cautious about surrounding, critical about every possibility around to design better* and became *cautious about end users*. This sensitivity or awareness was not there within the respondent before.

The similar process was continued till there were repetitive concepts or items getting generated. About 51 unique items were generated from the corpus of text. Partial list of open coded document is shown in Table 1.

Table 1: Partial List from Open Coding

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|---|
| <ul style="list-style-type: none"> ▪ Problem needs to be defined and crisp ▪ Learn to work with communities. ▪ To identify issues for a community and find a solution ▪ Collect community stories and represent them in a visual art form ▪ Use coding to create something that is visually pleasing ▪ In designing 'Process' is an important aspect ▪ One must do a thorough research ▪ Not concentrate only on the final product in silo ▪ Concentrate more on design process ▪ Step wise research helps to find out the loop holes in the product easily ▪ Creative intelligence helps to be productive risk taker ▪ Combination of technical knowledge with design knowledge is like cherry on the cake ▪ Design has opened the scope of creativity ▪ Need to have core knowledge in a field ▪ Reduction is an important element |
|---|

• Affinity diagramming

Affinity diagram was devised by a Japanese anthropologist Kawakita Jiro in 1960, also known as K-J Method or the affinity chart (Foster & Ganguly, 2007). It is a tool to generate groups of data based on their natural relationship through brainstorming (Foster & Ganguly, 2007). Affinity diagramming is a participatory method where concepts written on cards or sticky notes are sorted into related groups and sub-groups (Courage & Baxter, 2005). An affinity diagramming was done for determining how users mentally group the concepts into categories. Some broad categories have been identified and the items were generated from the open coding or primary labelling were written on sticky notes which are sorted into categories as a workshop activity with the students from different disciplines in an institute but taking up a course on Technology Start-up Ecosystem.

The steps for affinity diagram which was conducted in this study are as follows:

- I. Record each of the items from the list of open coding on the sticky note.
- ii. The broad category was plotted on a large sheet.
- iii. All the team members were allotted 15 minutes to

populate the sheet on related categories. Each member in the team was given a set of sticky notes which were consisted of all the items.

- iv. Then everyone in the team was individually allowed to move the sticky notes silently without discussion.
- v. The maximum number of votes for each of the items in a category was selected.
- vi. Then drawing of the final affinity diagram had been taken place.

The intension of this affinity diagramming was to diagnose the items which can explain the concepts by organizing the qualitative data generated through open coding.

Here in this study the outcome of the respondents or the participants in affinity diagramming workshop can be explained in the way that the items like 'never choose a single path of concept and go onto that path', 'learn to broaden perspective', 'by assuming multiple scenarios and escape plans risk can be taken', 'think about number of consequences and hence plan an escape strategy', 'taking risks depend on how one approach or deal with a crisis', 'with right rationale behind the ideas, productive and calculated risks can be taken' got connected to 'Productive Risk Taker' attribute or category based on their democratic choice.

Similarly, all the subcategories or items were brought under each attribute or category as shown in Table 2.

Table 2: Partial Least of Affinity Mapping for Categories and Sub Categories

Business Model Creation (BMC)
<ul style="list-style-type: none"> ▪ Problem needs to be defined and crisp (BMC) ▪ Think to create a unique product that will be successful in the market (BMC) ▪ Ability to create a business model of my own (BMC) ▪ Process of mapping out business models (BMC) ▪ Positive shift in the idea of creating something on my own (BMC)
Productive Risk Taker (PRT)
<ul style="list-style-type: none"> ▪ Never choose a single path of concept and go onto that path (PRT) ▪ Learned to broaden perspective (PRT) ▪ By assuming multiple scenarios and escape plans we take the risk (PRT) ▪ Think about number of consequences and hence plan an escape strategy (PRT) ▪ Taking risks is how one approach or deal with a crisis (PRT) ▪ With the right rationale behind the ideas, productive and calculated risks can be taken (PRT)
Implementation of Technical Knowledge (ITK)
<ul style="list-style-type: none"> ▪ To identify issues for a community and find a solution (ITK) ▪ Not concentrate only on the final product in silo (ITK) ▪ Need to have core knowledge in a particular field (ITK) ▪ Reduction is an important element (ITK) ▪ Minimize material consumption (ITK)

• **Axial Coding**

Axial Coding is the next phase after Open Coding as per grounded theory. According to Strauss & Corbin, (1998), to test emerging hypotheses, relationship statements are made at the abstract level, not from raw data, but from concepts. This requires a different, more sophisticated, coding technique, which is commonly referred to as 'axial coding' and involves the process of abstraction onto a theoretical level (Glaser and Strauss, 1967).

The abstract concepts encompass several concrete instances found in the data (Goulding, 2002). Throughout the various stages of data collection and interpretation, the analysis employs more sophisticated techniques for theoretical coding. According to grounded theory it is important to lift the analysis to a more abstract level. Therefore, the concept is away from description and leads more towards theory development (Goulding, 2002). Here in this study one such concept is 'Implementation of Technical Knowledge (ITK)' which the researcher derived a relation with 'Business Model Creation (BMC)'. Similarly, 'Empathy (Em)' can be related to 'Deep User Understanding (DUU)' and to 'Business Model Creation (BMC)', 'Navigate Through Complexity (NTC)' can be related to 'Emphasis on Process (EoP)' and both can be related to 'Business Model Creation (BMC)'. In this way these abstract relationships among different attributes were developed.

• **Selective Coding**

The analysis of categories and sub-categories were based on axial coding shows that all the categories are linked to 'Business Model Creation (BMC)'. The study from multiple transcripts developed from various participants' responses revealed that BMC has some relation with ITK, Em, CI, EoP, NTC, DUU, Pr, EC, PRT. (Refer to Table 3 for category codes).

Table 3: Categories After Affinity Mapping

Categories	Code
Implementation of Technical Knowledge	ITK
Creative Intelligence	CI
Productive Risk Taker	PRT
Navigate Through Complexity	NTC
Effective Communication	EC
Business Model Creation	BMC
Empathy	Em
Emphasis on Process	EoP
Deep User Understanding	DUU
Prediction	Pr

The categories or attributes and sub categories or items, which evolved through the qualitative research, were partially listed in Table 1, Table 2 and Table 3.

CONCLUSION

The study helped to identify the underlying attributes or the categories under Design Thinking and Creative cognition that can help to develop a set of capabilities for innovative thinking among Digital Entrepreneurs. Initially in this study Fifty-One unique items were generated through open coding. Through deep contextual and domain knowledge ten dimensions or categories were created and with Affinity mapping exercise categories or sub categories evolved through a democratic choice. A deep exploration and analysis were done to understand the relationship between different categories through Axial coding technique. For example, 'Creative Intelligence' can be closely connected with 'Implementation of Technical Knowledge' and can also be connected to 'Effective Communication'. Multiple such relationships can be created through Axial Coding. With all these relationships Selective Coding was conducted to identify the key attribute or category with which all the categories are connected. That key attribute is Business Model Creation which is linked to all other attributes like Creative Intelligence, Productive Risk Taker, and Navigate through Complexity, Effective Communication, Empathy and Emphasis on Process, Deep User Understanding, and Prediction. Therefore, the items along with the attributes can be used to develop a set of capabilities that can facilitate the growth of digital entrepreneurship, which can be determined by Business Model Creation.

REFERENCES

- Blank, S. (2013). *The Four Steps to the Epiphany: Successful Strategies for Products that Win*. 5th edition. K & S Ranch. California.
- Corbin, J.M., & Strauss, A. (1990). Grounded Theory Research: Procedures, canons and evaluative criteria. *Qualitative Sociology*, 13(1), pp 3-21.
- Courage, C. & Baxter K. (2005). *Understanding your users. A practical guide to user requirements: Methods, tools and techniques*. Morgan Kaufmann. San Francisco, CA.
- Foster, S.T. & Ganguly, K.K. (2007). *Managing Quality: Integrating the Supply Chain*. Pearson Prentice Hall. Upper Saddle River. New Jersey.
- Glaser, B.G. & Strauss, A. L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Aldine De Gruyter. New York.
- Goulding, C. (2002). *Grounded Theory: A Practical Guide for Management, Business and Market Researchers*. 1st Edition. SAGE Publications Ltd. US.
- Liedtka, J. (2015). Perspective: Linking Design Thinking with Innovation Outcomes through Cognitive Bias Reduction. *Journal of Product Innovation Management*, 32(6), pp 925-938. DOI: 10.1111/jpim.12163
- Müller, B. & Rammer, C. (2012). Start-up promotion instruments in OECD countries and their application in developing countries. ZEW Gutachten/ Forschungsberichte. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. Germany.
- Parry, K.W. (2003). How? and Why?: Theory Emergence and Using the Grounded Theory Method to Determine Levels of Analysis. *Research in Multi-Level Issues*, 2, pp 127-141. DOI: 10.1016/S1475-9144(03)02008-3.
- Ries, E. (2011). *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. Currency Press. Australia.
- Schwab, K. (2014). The Global Competitiveness Report 2014–2015. World Economic Forum. Geneva. Retrieved From: http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf
- Strauss, A. & Corbin, J. (1998). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. Sage Publications, Inc. Thousand Oaks, CA.
- Subrahmanya, M.H.B. (2017). How did Bangalore Emerge as a Global Hub of Tech Start-Ups in India? Entrepreneurial Ecosystem-Evolution, Structure and Role. *Journal of Developmental Entrepreneurship*, 22(01), 1750006. DOI: 10.1142/S1084946717500066
- Ward, T.B. (2004). Cognition, Creativity, and Entrepreneurship. *Journal of Business Venturing*, 19(2), pp 173-188. DOI:10.1016/S0883-9026 (03) 00005-3