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Discovery Skills and Innovative Work Behavior – A Study of the Indian IT Workforce#

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Abstract

This paper uses the existing literature to understand what is it that innovative individuals do differently, and what are the factors which lead to innovators behaving differently in the context of an Indian IT organization. The paper explores Innovator's DNA Model proposed by Harvard and uses the same to draw relationship between the skills of an innovator and the work behavior showcased by them. To establish this relationship, the researchers administer a questionnaire consisting of 40 items ; (20) for Innovator's DNA, (13) for Innovative Work Behavior, (7) for demography. The questionnaire was responded by 50 Innovators and 50 Non-Innovators of an Indian IT organization. The paper compares the factors contributing to Innovator's DNA and Work Behavior in case of Innovators and Non Innovators and concludes that there is a relationship between the Discovery Skills of an Innovator and the Innovative Work Behavior showcased by them. The paper concludes by proposing a model created using SPSS AMOS that correlates Discovery Skills and Innovative Work Behavior by identifying 6 factors for innovator's DNA and 4 factors for Innovative Work Behavior, in case of innovative individuals

Keywords: Innovation, Innovator's DNA, Innovative Work Behavior, IT, IT organization , Discovery Skills, Creativity, Medici Effect, Breadth and Depth of Experience

1. Introduction

Albert Einstein rightly said, "If you always do, what you always did, you will always get, what you always got". In order to do something differently, innovation is of prime importance. From Cave men to industrialists, Bullock Carts to Ford Model T, human beings have progressed only because of their ability to innovate, which distinguishes them from other species on the planet. Stepping into 22nd Century, has pushed mankind into an era of accelerated change, with Artificial Intelligence, Automations, Start Up, Blockchain disrupting the business world, sustenance is only possible with constant innovation.

For individuals to survive in this world of constant change it is of importance, that specific skills leading to innovation and Innovative Work Behavior of individuals in an organization can be identified, assessed and nurtured, which prompted the researchers to undertake research in the Indian IT/Knowledge Industry. Knowledge industries are those industries which are based on their intensive use of technology and/or human capital. While most industries are dependent in some way on knowledge as inputs, knowledge industries are particularly dependent on knowledge and technology to generate revenue. Some industries included in this category are education, consulting, finance, insurance, health service, and communications. For the purpose of this research, the term IT/Knowledge Industry would be used interchangeably.

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Forbes surveyed about 1000 professionals at EY, during which employees stated that they were adapting to disruption but felt that innovation was not bringing any change to their own jobs. More than half of the respondents said, that they were still focused on their daily jobs. From a talent perspective, companies are missing potential opportunities to engage employees, hence Identification of Innovative Work Behavior and traits leading to the same in individuals, will help organization to bridge the talent gap between the right role and the right fit. The innovative traits identified in potential recruits will guide organizations to make the right decision while selecting an individual for a thought provoking role – a role which quests their eagerness to bring change and newness in a particular function, department or domain and hence make a difference, and will also help organization to retain talent. While studying the literature already available on the topic of Innovative Work Behavior, the researchers identified that there have been many studies on how an innovative personality should be, but none of the studies have shown correlation between discovery skills and Innovative work behavior, especially in the context of Indian IT industry. Also, no correlation has been established between depth and breadth of exposure to domain/technology/area/function and Innovative Behavior of individuals.

Hence, with this research, the researchers aim to delineate the skills from the literature that lead to Innovative Work Behavior (IWB) within individuals working in IT/Knowledge Industry and identify the relationship between these skills and the IWB. The researchers aim to accomplish the above-mentioned objective using regression analysis as a statistical tool for validating the proposed relationship. The research paper has been broadly divided into the following sections: Literature Review, followed by Research Hypothesis Development, Data Analysis and Findings and lastly Conclusions and Limitations.

2. Literature Review

2.1 Innovation and Creativity: The Definition

Innovation and creativity are phenomenon, where talking about one and leaving out the other would be inappropriate. Creativity leads to innovation and hence in this Literature Review, the researchers make a mention about both the phenomena.

Mihaly Csikszentmihalyi in his book "Creativity: Flow and the psychology of Discovery and Invention" talks about creativity and innovation interchangeably and describes creativity as some sort of mental activity, an insight that occurs between a person's thought and a sociocultural context. The author mentions that creativity can be observed only in a system made up of three main parts i.e. 1) Domain: Domains are usually nested in what we call as the culture, or the symbolic knowledge shared by particular society or by humanity as a whole, 2) Field, which includes all the individuals who act as gatekeepers to the domain and 3) Person, the creative individual. Johansson in his book The Medici Effect talks about Innovation being extremely practical. The aim is to produce results. Therefore, according to Medici, creativity occurs when individuals take actions within the society. Without Social validation, a concept cannot be associated with innovation (Johansson, 2004).

However, Lewis and Taylor in their research on 'How does Creativity Complement Today's Currency of Innovation?' discuss that Innovation is not the same as creativity. Innovation is structured creativity focused on producing an innovative product, service, or system. It is a "practical creativity." Although related, creativity and innovation are distinct and different. Creativity is a subcomponent of innovation. Innovation is a process that

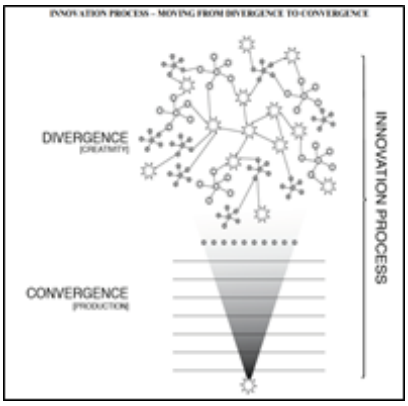


Figure 1. From divergence to convergence (Lewis & Wright, 2012).

involves moving from divergent ideas to a convergent solution (Figure 1). In this definition creativity is a measure that can be applied to divergence. Creativity can be thought of as the starting point for innovation. Consequently, creativity and innovation should be assessed differently (Lewis & Wright, 2012).

Innovative behavior has multiple facets that unfold over time. Typically, idea generation and subsequent idea implementation are differentiated as the main building blocks of innovation (Krause 2004; Bledow et al., 2009). Innovation is also social in nature, such as when others need to be influenced and convinced about the value of an idea or their help needs to be mobilized to implement novel ideas. Refer to Appendix III for better understanding of conceptualization of innovation from different perspectives. Refer to Table 14 in Annexures for a summary of all definitions.

2.2 Innovation and Creativity: The Personalities

Mihaly Csikszentmihalyi in his book "Creativity: Flow and the psychology of Discovery and Invention" in his book talks about 3 kinds of creative individuals; 1) Brilliant Conversationalist, a person with varied interests and quick mind 2) Personally Creative, refer to people who experience the world in novel and original ways, 3) Extremely Creative Individuals, Individuals like Einstein, Picasso and Edison, who have changed the culture in some important ways. He says that creative personalities are driven by a few traits, the first trait perhaps is the genetic pre-disposition for interest in a domain. He uses ten pairs of characteristics to describe them. Refer to the (Table 1) for pairs of characteristics.

Table 1. Mihaly's characteristic pairs – creative individuals.

Pair Sno.	Character 1	Character 2
1	Creative Energy	At Rest
2	Smart	Naïve
3	Endurance	Intuition
4	Imagination	Rooted Sense of Reality
5	Extroversion	Introversion
6	Humble	Proud
7	Sensitive and Caring	Tough and Aggressive
8	creative and conservative	rebellious and iconoclastic
9	Passion	Objective
10	Very Sensitive	Low Threshhold of Pain

Kirton in his research on Innovators and Adaptors suggests that people can be located on a continuum of cognitive style, ranging from adaptor to innovator, dependent on the characteristic mode in which they solve problems (create or make decisions). The Kirton Adaption-Innovation Inventory (KAI) is the measure devised to locate respondents on this continuum. Xu and Tuttle in their research on Adaption – Innovation at work talk about a new approach of nine item AI-W scale of assessing Innovator and Adaptor.

Dye, Gregersen and Christensen in their research paper 'The Innovator's DNA' suggests that there are 5 major skills that come into play while Innovation occurs i.e. Associating, Questioning, Observing, Experimenting and Networking. 1) Associating, or the ability to successfully connect seemingly unrelated questions, problems, or ideas from different fields, is central to the innovator's DNA. 2) Questioning: Innovative Individuals tend to question the status quo and tend to spend a lot of time thinking the 'What Ifs'. Imagining Opposites and embracing constraints are one of the key characteristics of Innovator's DNA. 3) Observing: Innovators carefully, intentionally, and consistently look out for small behavioral details—in the activities of customers, suppliers, and other companies—in order to gain insights about new ways of doing things. 4) Experimenting: As executives of innovative enterprises, they make experimentation central to everything they do. 5) Networking: Devoting time and energy to finding and testing ideas through a network of diverse individuals gives innovators a radically different perspective. Unlike most executives—who network to access resources, to sell themselves or their companies, or to boost their careers—innovative entrepreneurs go out of their way to meet people with different kinds of ideas and perspectives to extend their own knowledge domains (Dyer, Gregersen, & Christensen, 2009).

2.3 Innovation and Creativity: The Power of Integration and Intersection

Frans Johansson says in his book 'The Medici Effect' mentions about the phenomenon of intersection of fields and the generation of ideas from them. He

mentions about 2 types of innovations 1) Directional Innovation and 2) Intersectional Innovation. When one works at the intersection, one combine concepts between multiple fields, generating ideas that leap in new directions. He mentions, the best chance to innovate lies at the intersection. Intersection happens due to 2 things. There are two main types of random combinations involved in generating creative ideas. 1) "Flash-in-the-sky serendipity", happens while we are trying to solve a problem. 2) Random combinations, are "prepared mind discoveries." They happen when people with a "prepared mind" encounter a phenomenon they had not set out to find. This needs a "prepared mind" because this observation could easily be missed unless one is prepared to understand its significance (Johansson, 2004).

Roger Martin in his book 'The Opposable Mind' calls out the power of Integrative Thinking. He says that true innovators can hold 2 contradictive thoughts in their mind at one time and then work through the unique strengths and challenges of each to create an even better third option. Integrative Thinking shows the way beyond either-or and it comes to one solution without disregarding the advantages of other solutions (Martin, 2009).

In one of the articles, Barry Gilbert mentions that Innovation occurs at a triple intersection. Knowledge is essential to human progress. When Knowledge, Opportunity and Anticipation intersect, the magic of Invention occurs. But only when this leads to products in the service of community does the result deserve to be called Innovation (Gilbert, 2002).

2.4 Creativity and Innovation: Impact of Different Experiences

Frans Johansson in his book mentions the importance of varied experience for intersectional ideas. The key here is Diversity. If generating cross-sectional ideas is related to increase in randomness, then introducing it intentionally into our thought process makes perfect sense. An effective way to be moving between jobs, switching fields or sub domains every 2 years, however one must strike a balance between a) Depth and breadth b) Generating many ideas actively c) Taking time for evaluation. (Johansson, 2004)

Knowing only a little about the concepts in the different domains, would help us in making up the intersection and help us in being ahead in the game. High amount of expertise can solidify the possible barriers within fields. However, expertise is needed to focus and generate new ideas. (Johansson, 2004)

Gabrielsson and Politis in their research find out that the strongest predictor of new business idea generation is a learning mindset. They find that functional work experience breadth favors the business idea generation while work experience depth has a negative correlation with business idea generation. (Gabrielsson & Politis, 2012). Wikipedia carried out a research on Criteria of Innovativeness and Creativity in Start-Ups and Innovative Entrepreneurship across employees who are a part of a Talent program in Cheqke Republic (Wikipedia, n.d.). Statistically significant differences between the age category and creativity ($p = 0.048$) and the length of job history and the creativity are seen upon demonstration with Job Performance. Also, an additional role is played by education in innovativeness. Reduced Creativity may be seen due to teaching of standardized thinking in Universities (Vnoučková, 2018).

3. Research Hypothesis and Methodology

Human Resource is the biggest and the most precious wealth for an IT industry. The skills of these individuals is what matters the most. In order to evaluate, check and question; the kind of profile and the characteristics, which lead to higher innovative behavior the following hypothesis are proposed.

H1: Innovative Work Behavior increases with the increase in depth of experience in at least two of the Areas/Technologies/Functions/Domains.

H2: Innovative Work Behavior increases with the increase in the level of Discovery Skills (Associating,

Networking, Experimenting, Questioning and Observing) in an individual.

Since there has been less work previously in this domain (Refer to Annexure III), the researchers intended to go for Exploratory Research, and utilize the various researches done in the past, take lessons from it and bring out certain new dimensions for the field of IT/ Knowledge Industry. The extensive literature available had to be tested in an IT Industry Scenario, for which an evidence based Empirical research has been conducted using Quantitative Research Methodology in IT/ Knowledge Industry taking into account the variant Inventories/Questionnaires available that dealt with Innovative/Creative thinking and Innovative Work Behavior.

Stephen and Luke in their research mention about six key facets of innovative behavior that should lead to innovation outputs. In this research, they suggest that employee innovative behavior is a multifaceted construct that reflects key aspects of innovation and they evaluate it with an inventory consisting of 6 factors – idea generation (3 items), idea search (4 items), idea communication (4 items), implementation starting activities (3 items), Involving Others and Overcoming Obstacles (9 items), innovation outputs (3 items), and key contextual influences on employee innovative behavior (Luke & Stephen, 2016). Dorenbosch and van Engen cross refer Janssen work on Innovative Work Behavior (IWB) wherein they discuss that IWB is a complex behavior consisting of four interrelated sets of behavioral activities, namely (1) problem recognition (3 items), (2) idea generation (3 items), (3) idea promotion (3 items) and (4) idea realization (3 items) (Dorenbosch, Engen, & Verhagen, 2005). According to Mihaly, a creative process involves 5 steps, (1) Preparation: Becoming immersed in something which arouses curiosity; (2) Incubation: Phase where ideas churn out below the threshold of consciousness (3) Insight: The moment which is the 'Aha' Moment (4) Evaluation: Where in the person decides which insight is worth pursuing (5) Elaboration: The phase of implementation which requires the maximum time (Csikszentmihalyi, 2007).

Measures

The Innovative Skills of the individuals have been measured for this study using scales from available literature such as KAI (Kirton's Adaptor Innovator Inventory) consisting of 33 items, expressing 3 factors Conformity (13 items); Efficiency (7 items); Originality (13 items) and Innovator's DNA, wherein the researchers could get access to the mini Questionnaire available in the book named (Dyer, Gregersen, & Christensen, 2019) mentioning 20 questions expressing 2 Skills – Discovery (5 factors – Associating; Questioning; Networking; Observing and Experimenting) and Delivery Skills.

While Creating the Inventory for this research, 13 items corresponding to Innovative Work Behavior were selected from already validated Janssen's inventory and Stephen and Luke's inventory; 20 items corresponding to Innovative Skills of Individuals which were selected from already validated Innovator's DNA inventory (10 items); The Big Five Personality Test (5 items); Kirton Adaption Inventory (3 items); MBTI Inventory (2 items). The Inventory consisted of 7 items, to know about Age Group (1 item); Work Experience (2 items); Hobbies (2 items); Grasping new Technologies (2 items). In total the Inventory consisted of 40 items. All the Questions for Innovator's DNA and Innovative Work Behavior were asked to be rated on a 5-point Liker Scale. The Labels used for Innovator's DNA were Strongly Agree; Agree; Neutral; Disagree and Strongly Disagree; while the labels used for Innovative Work Behavior were Always; Often; Sometimes; Rarely and Very Rarely.

Data Collection and Sampling

The Questionnaire was created on an Internal Tool called Communication Builder and was shared with the sample using E-Mail. The sampling technique used in this study is a cluster sampling technique, wherein the Sample was divided into 2 clusters of Highly Innovative and Highly Non-Innovative Individuals. The Clustering was done by asking the managers of the population, to nominate 3 Highly Innovative and 3 Non-Innovative Individuals from their teams. The inventory was sent to 75 Innovative and 75 Non-Innovative Individuals;

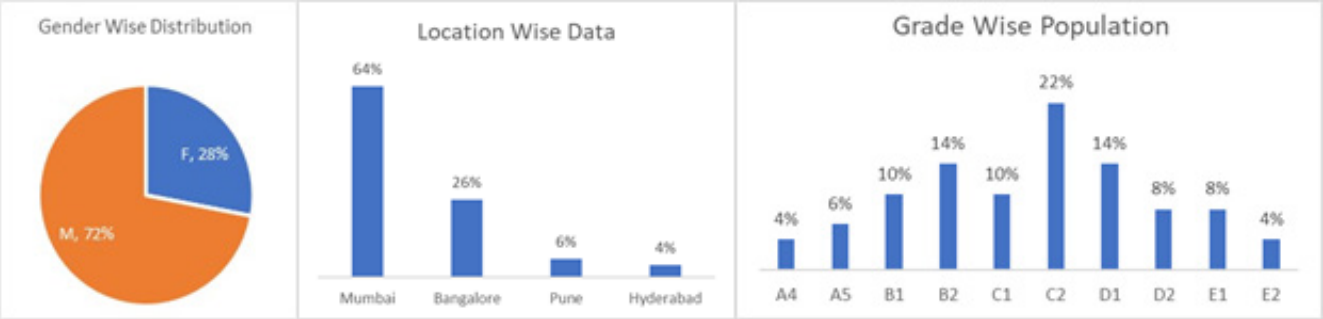


Figure 2. Distribution of both the samples basis gender location and grades.

Out of which the researchers were able to gather 50 responses on the innovative side and 50 on the Non-Innovative Side. The Distribution of both the samples basis gender location and grades is shown in (Figure 2).

4. Data Findings and Analysis

4.1 Reliability Analysis

As per (Table 2), the alpha value for 40 items corresponding to IDNA and IWB is .9, implying that the data is highly reliable for innovators and as per (Table 8), the alpha value for 40 items corresponding to IDNA and IWB is .75 implying that the data is reliable. While comparing the Mean for both the clusters, a clear difference in the Innovator's DNA and Innovative Work Behavior can be seen. Refer to (Tables 15 and 16) for better understanding.

4.2 Factor Analysis – Innovators

As per the Harvard Framework of Innovator's DNA, the framework comprises of 5 major factors i.e. Associating, Questioning, Observing, Networking and Experimenting. However, when the same framework was applied to 50 individuals of Indian IT organization and a Principal Component Analysis with varimax rotation was conducted, 6 factors were observed. The 6th factor has been named as Non-Conformity and correlates with only one item on the inventory. The Table mentions the items corresponding to each factor. Only those items, where the factor loading was more than .5, have been considered corresponding to that factor. Only in case of items IDNA 1 and IDNA 4, the factor to which the correlation of the item was maximum has been considered.

Factors	Eigen Values	Items
Questioning	6.562	IDNA_3; IDNA_5; IDNA_13; IDNA_2; IDNA_10; IDNA_16
Experimenting	2.033	IDNA_18; IDNA_11; IDNA_17; IDNA_12; IDNA_6
Networking	1.659	IDNA_19; IDNA_20; IDNA_4
Observing	1.285	IDNA_14; IDNA_8; IDNA_15; IDNA_1
Associating	1.188	IDN_9
Non-Conformity	1.098	IDNA_7

Refer to Table 3 for details on the factor loads for each of the factors and items and **Annexure I** to view the inventory and items

As per Janssen, the Innovative Work Behavior consists of 3 factors, Idea generation, communication and realization, however when the questionnaire was exposed to 50 individuals of the Indian IT Industry, and a Principal Component Analysis was done with varimax rotation, 4 factors were identified. The Table mentions the items corresponding to each factor. Only those items, where the factor loading was more than .5, have been considered corresponding to that factor. Only in case of IWB_12 and IWB_6; the factors corresponding to the maximum factor loadings were selected.

Factors	Eigen Values	Items
Idea Generation	1.483	IWB_5; IWB_2; IWB_9; IWB_6
Idea Communication	1.218	IWB_1; IWB_12; IWB_13
Idea Realization	4.698	IWB_7; IWB_8; IWB_3; IWB_10; IWB_4
Idea Correlation	1.068	IWB_11

Refer to Table 4 for details on the factor loads for each of the factors and items and **Annexure I** to view_the inventory and items

4.3 Factor Analysis – Non-Innovators

As per the Harvard Framework of Innovator's DNA, the framework comprises of 5 major factors i.e. Associating, Questioning, Observing, Networking and Experimenting. However, when the same framework was applied to 50 Non – Innovators of Indian IT organization and a Principal Component Analysis with varimax rotation was conducted, 9 factors were observed. Since 9 factors, were difficult to accommodate for a regression analysis, 6 factors were retained, by selecting the respective options in SPSS. The 6th factor has been named as Non-Conformity in order to maintain consistency. The below table mentions the items corresponding to each factor. Only those items, where the factor loading was more than .45, have been considered corresponding to that factor. Only in case of items IDNA 4, the factor to which the correlation of the item was maximum has been considered.

Factors	Eigen Values	Items
Networking	3.735	IDNA_17, IDNA_18, IDNA_19, IDNA_20, IDNA_7, IDNA_4
Observing	2.255	IDNA_11, IDNA_12, IDNA_9
Associating	1.605	IDNA_14, IDNA_15, IDNA_8
Questioning	1.580	IDNA_5, IDNA_6
Experimenting	1.556	IDNA_1, IDNA_3, IDNA_16
Non-Conformity	1.379	IDNA_2, IDNA_13, IDNA_10

Refer to Table 9 for details on the factor loads for each of the factors and items and **Annexure I** to view the inventory and items

As per Janssen, the Innovative Work Behavior consists of 3 factors, Idea generation, communication and realization, however when the questionnaire was exposed to 50 Non-Innovative individuals of the Indian IT Industry, and a Principal Component Analysis was done with varimax rotation, 4 factors were identified. The Table mentions the items corresponding to each factor. Only those items, where the factor loading was more than .5, have been considered corresponding to that factor. Below mentioned table gives items correlating to the respective factors.

Factors	Eigen Values	Items
Idea Communication	4.178	IWB_3, IWB_8, IWB_9, IWB_10
Idea Generation	1.960	IWB_2, IWB_4, IWB_5, IWB_6, IWB_12
Idea Realization	1.331	IWB_11, IWB_13
Idea Correlation	1.047	IWB_1, IWB_7

Refer to Table 9 and 10 in Annexure II for details on the factor loads for each of the factors and items and **Annexure I** to view the inventory and items for Non-Innovative Individuals

4.4 Regression Analysis – Innovators

A stepwise linear regression analysis was conducted between Innovator's DNA as a dependent variable and all the demographic values i.e. Age; Years of Work Experience; Different Departments of Work Experience; Different Types of Interest Areas; Years of Exposure to an Interest Area; Different types of Technologies a person has learnt and the level of Exposure to these technologies. The regression analysis using the data points in an Indian IT context showed that there is a significant relationship between Innovative Skills of an individual and depth of exposure to one Interest area such as Arts, Literature, Photography and many others. When the regression analysis was carried between Innovative Work Behavior and various demographic Factors, it was observed that a significant relationship exists between Exposure to different types of Technologies and Innovative Work Behavior of an Individual. Hence it can be said that while keeping eagerness towards one Interest Area/Hobby of individual might lead to an individual being highly innovative; exposure to various kinds of technologies and the eagerness to learn the same would lead to an increased innovative work behavior. Refer to (Tables 5 and 6), to view the coefficient Matrix. Hence in this research the null hypothesis. H1: Innovative Work Behavior increases with the increase in depth of experience in at least two of the Areas/Technologies/Functions/Domains must be rejected.

H2: Innovative Work Behavior increases with the increase in the level of Discovery Skills (Associating, Networking, Experimenting, Questioning and Observing) in an individual.

While using Regression Analysis by taking Innovator's DNA as independent and Innovative Work Behavior as Dependent, it has been observed that a significant positive relationship exists between the two variables, and by considering the coefficients summary table, the equation can be deciphered.

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.989	.440		4.523	.000
	Innovators_DNA	.535	.113	.564	4.727	.000

a. Dependent Variable: Innovative_Work_Behaviour

Innovative Work Behavior = .535(Innovator's DNA) + 1.989

After this a stepwise regression, between Innovative Work Behavior and Discovery Skills (Associating, Networking, Experimenting, Questioning and Observing and Non-Conformity) helped us find that a significant relationship exists between Questioning and Associating factors of Innovator's DNA, contributing to Innovative Work Behavior and giving rise to the equation.

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.657	.386		6.886	.000
	IDNA_Questiong	.356	.097	.467	3.660	.001
2	(Constant)	2.231	.417		5.354	.000
	IDNA_Questiong	.287	.098	.376	2.916	.005
	IDNA_Associating	.183	.082	.289	2.238	.030

a. Dependent Variable: Innovative_Work_Behaviour

Innovative Work Behavior = 0.183(IDNA_Associating) +.287(IDNA_Questioning) + 2.231

Hence this proves our hypothesis that innovative Work Behavior increases with the increase in discovery skills of an individual particularly Questioning and Associating skills, hence the null hypothesis H2 is accepted.

4.5 Regression Analysis_– Non-Innovators

A stepwise linear regression analysis was conducted between Innovator's DNA as a dependent variable and all the demographic values i.e. Age; Years of Work Experience; Different Departments of Work Experience; Different Types of Interest Areas; Years of Exposure to an Interest Area; Different types of Technologies a person has learnt and the level of Exposure to these technologies. The regression analysis using the data points in an Indian IT context for Non-Innovative Individuals showed that there is no significant relationship between Innovative Skills of an individual and any demographic variable. When the regression analysis was carried between Innovative Work Behavior and various demographic Factors, it was observed that no significant relationship exists between any demographic factors and Innovative Work Behavior of an Individual. Refer to (tables 11 and 12) to view the coefficient Matrix. Hence in this research the null hypothesis. H1: Innovative Work Behavior increases with the increase in depth of experience in at least two of the Areas/Technologies/Functions/ Domains must be rejected.

H2: Innovative Work Behavior increases with the increase in the level of Discovery Skills (Associating, Networking, Experimenting, Questioning and Observing) in an individual.

While using Regression Analysis by taking Innovator's DNA as independent and Innovative Work Behavior as Dependent, it has been observed that a significant positive relationship exists between the two variables, and by considering the coefficients summary table, the below equation can be deciphered even for Non Innovators in an Indian IT Context.

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.300	.790		2.913	.005
	Innovators_DNA	.441	.216	.283	2.047	.046

a. Dependent Variable: Innovative_Work_Behavior

Innovative Work Behavior = .441(Innovators_DNA) + 2.300

After this a stepwise regression, between Innovative Work Behavior and Discovery Skills (Associating, Networking, Experimenting, Questioning and Observing and Non-Conformity) helped us find that a significant relationship exists between Observing factor of Innovator's DNA, contributing to Innovative Work Behavior and giving rise to this equation

Innovative Work Behavior = 0.323(IDNA_Observing) + 2.680

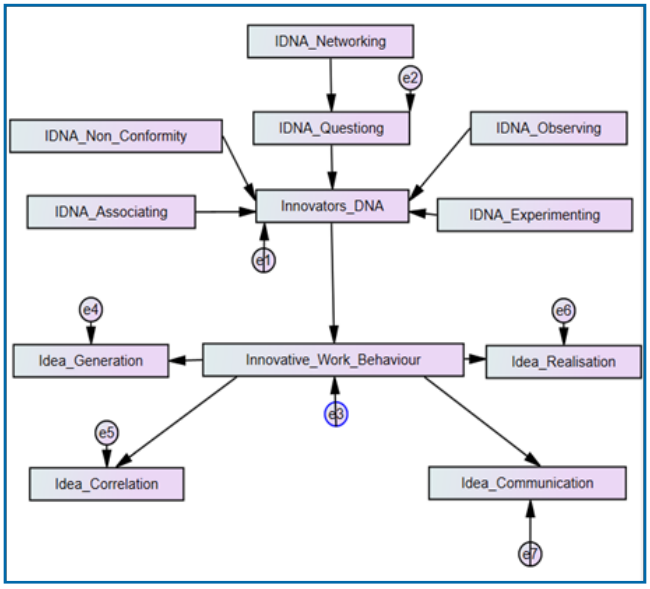
Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.680	.423		6.329	.000
	IDNA_Observing	.323	.110	.390	2.933	.005

a. Dependent Variable: Innovative_Work_Behavior

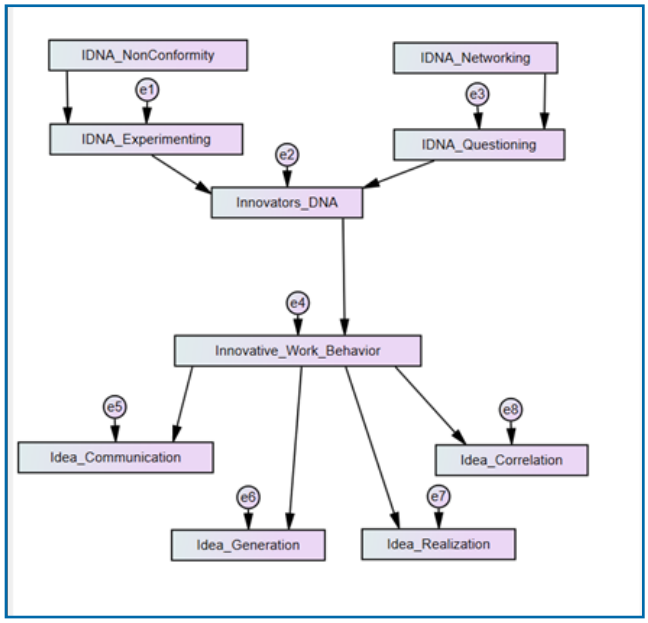
Hence, this proves our hypothesis that innovative Work Behavior increases with the increase in discovery skills of an individual particularly Observing Skills in case of Non-Innovators, hence the null hypothesis H2 is accepted.

4.6 Analysis in AMOS – Innovators



The regression analysis in AMOS helped the researchers finds the above-mentioned Framework. The framework showcases that Innovator's DNA is composed of 6 factors i.e., Associating, Experimenting, Networking, Observing, Questioning and Non-Conformity. There is a strong correlation between networking and questioning. Out of these factors, Questioning and Experimenting seem to be the most prominent factor in an individual who is highly innovative. The relationship between Innovator's DNA and Innovative Work Behavior is positive and strong implying that anyone who has the DNA of an Innovator composed of Discovery Skills will lead to showcasing of that kind of behavior professionally as well. The Innovative Work Behavior showcases a very strong correlation with idea Generation and Realization, which implies that generation and implementation of all ideas lead to innovative work behavior. Refer (Table 7) in Annexure II.

4.7 Non-Innovators



The regression analysis in AMOS for Non-Innovative Individuals helped the researchers finds the above-mentioned Framework. The framework showcases that Innovator's DNA in case of Non-Innovators is composed of 4 factors, Non-Conformity, Experimenting, Questioning and Experimenting. There is a strong correlation between networking and questioning and Non-Conformity and Experimenting. Out of these factors, Questioning and Experimenting

seem to be the most prominent factor in an individual who is highly innovative. The relationship between Innovator's DNA and Innovative Work Behavior is positive and strong implying that anyone who has the DNA of an Innovator composed of Discovery Skills will lead to showcasing of that kind of behavior as well. The Innovative Work Behavior showcases a very strong correlation with idea Generation and Realization, which implies that generation and implementation of all ideas lead to innovative work behavior. Refer (Table 13) in Annexure II.

5. Conclusions and Limitations

The framework achieved using AMOS, has only been tested in the Indian IT context and has not been evaluated in other geographies or industries. The research sample in the research was restricted to 100 employees in majorly 4 states of India i.e. Mumbai, Pune, Hyderabad and Bangalore, hence the research has not been extended to other zones such as eastern and northern zones of India. However, the research has drawn, collated and inferred many frameworks and ideas from the researches done in the past. Using the Innovator's DNA research by Harvard and Innovative Work Behavior by Janssen; the researchers was able to draw out uniqueness, in the IT industry. The research has contributed to academia by giving a perspective of the 6th factor in Innovator's DNA research and 4th factor in Innovative Work Behavior research. The new perspective of correlation between discovery skills and innovative work behavior in an IT Context has been deciphered during this research. The research has contributed to the researchers by bringing together lots of various concepts about innovation on one research paper. The research has contributed to the industry by showcasing the importance of these innovative skills and how an inventory can be uses to assess the innovative personality traits of a potential employee. Further to the scope, the future researchers can verify the provided framework in other industries/ geographies and showcase a comparison between each of them. The mediation and Moderation effects of learning or growth mindset leading to innovation can also be studied which currently have not been explored in this paper. The research can also be extended to organization culture and managerial attributes to test how the relationship between skills and work behavior gets impacted by the factors of the ambience.

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Annexure I: Inventory Created

INVENTORY		
S No.	**Questions**	**Citations**
1	Select Your Age Group	Demographic Questions
	a) 25 or Less Than 25 ; b) 25 to 35(Including 35) ; c) 36 to 45(including 45) ; 46 to 55(including 55) ; more than 56	
2	Select Your Work Experience	
	a) 0 to 5 years ; b) 5 to 10 years; c) 10 to 15 Years ; d) 15 to 20 years ; e) more than 20	
3	How do you spend 10% of your free time ?	
	a) Dance ; b)reading ; c) Photography ; d) Cooking ; e) Reading ; f) Writing Literature ; g) Art ; h) Others	
4	How Many Years have you been exposed to the above mentioned Hobby	
	a) 0 to 2 years ; b) 2 to 4 years; c) 4 to 6 Years ; d) 6 to 8 years ; e) more than 8	
5	In the last 2 years, how many technologies have you learnt	
	a) 0 to 2 ; b) 2 to 4 ; c) 4 to 6 ; d) 6 to 8 ; e) more than 8	
6	Out of the above-mentioned technologies, for how many would you rate your understanding of 8 on a scale of 10	
	a) 0 to 2 ; b) 2 to 4 ; c) 4 to 6 ; d) 6 to 8 ; e) more than 8	
7	Select from the below options, different departments that you have worked in	
	a)Gen Management & Strategy ; b)Legal ; c)Finance ; d)Technology ; e) Sales & Marketing	
Innovator's DNA		
S No.	**Questions**	**Citations**
1	I understand things quickly	The Big Five Personality Test
2	I am indigenious and a deep thinker	The Big Five Personality Test
3	Frequently, my ideas or perspectives diverge radically from the perspective of my colleagues, peers and superiors	(Dyer, Gregersen, & Christensen, 2019)
4	I often find solutions to problems by drawing on solutions or ideas developed in other industries, fields or disciplines	(Dyer, Gregersen, & Christensen, 2019)
5	I regularly ask questions that challenge the status quo	(Dyer, Gregersen, & Christensen, 2019)
6	I Frequently ask 'what if' questions that provoke exploration of new possibilities and frontiers	(Dyer, Gregersen, & Christensen, 2019)
7	I Never seek to bend or break the rules	(TAYLOR, 1989)
8	I prefer colleagues who never ask questions and avoid taking risks	(TAYLOR, 1989)
9	New Ideas often come to me, when I am directly observing how people react towards products and services	(Dyer, Gregersen, & Christensen, 2019)
10	I like to reflect a lot	The Big Five Personality Test
11	I actively seek to identify emerging trends in my domain of work, by reading books, articles, magazines, books and so on	(Dyer, Gregersen, & Christensen, 2019)
12	I regularly observe the activities of customers, suppliers or other oranisations to get new ideas about areas of improvement	(Dyer, Gregersen, & Christensen, 2019)
13	I frequently experiment to create a newer way of doing things	(Dyer, Gregersen, & Christensen, 2019)
14	I have difficulty understanding abstract ideas	The Big Five Personality Test
15	I do not have good imagination	The Big Five Personality Test
16	I always think of something new and different than what already exists	(TAYLOR, 1989)
17	I regularly talk with diverse set of people to find and define new rules for an area/process of work (eg from different functions, different geographies, different industries)	(Dyer, Gregersen, & Christensen, 2019)
18	I attend conferences (in my areas of expertise as well as unrelated areas) to meet new people and understand what issues they are facing	(Dyer, Gregersen, & Christensen, 2019)
19	I am seen as "outgoing" or as a "people person."	(coordinator@myersbriggs.org, 2019)
20	I feel comfortable in groups and like working in them.	(coordinator@myersbriggs.org, 2019)
Innovative Work Behaviour		
S No.	**Questions**	**Citation**
1	I try new ways of doing things at work	(Luke & Stephen,2016)
2	When I have a new idea, I try to involve people who are able to collaborate on it.	(Luke & Stephen,2016)
3	I ensure acquiring approval for new ideas	(Janssen, 2000)
4	When something does not function well at work, I try to find new solution.	(Luke & Stephen,2016)
5	I prefer work that requires original thinking	(Luke & Stephen,2016)
6	I try to get new ideas from colleagues or business partners.	(Luke & Stephen,2016)
7	I usually do not finish until I accomplish the goal	(Luke & Stephen,2016)
8	I try to involve key decision makers in the implementation of an idea	(Luke & Stephen,2016)
9	I evaluate the utility of new ideas	(Janssen, 2000)
10	I am able to persistently overcome obstacles when implementing an idea	(Luke & Stephen,2016)
11	Many ideas I came up with are implemented in our organization.	(Luke & Stephen,2016)
12	I develop suitable plans and schedules for the implementation of new ideas.	(Luke & Stephen,2016)
13	I have been often successful at work in implementing my ideas and putting them in practice	(Luke & Stephen,2016)

Annexure II: Data Analysis and Findings

Table 2. Reliability statistics

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.888	.901	40

Table 3. Factor analysis and loads using PCA and varimax rotation

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
IDNA_3	.754					
IDNA_5	.750					
IDNA_13	.616					
IDNA_2	.598					
IDNA_10	.581					
IDNA_16	.527					
IDNA_18		.803				
IDNA_11		.788				
IDNA_17		.756				
IDNA_12	.494	.598				
IDNA_19			.848			
IDNA_20			.835			
IDNA_4	.401		.412			
IDNA_14				.791		
IDNA_8				.701	.419	
IDNA_15				.642		
IDNA_1						
IDNA_9					.829	
IDNA_7						.799
IDNA_6		.575				-.584

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.[a]

a. Rotation converged in 7 iterations.

Table 4. Factor analysis and loads using PCA and varimax rotation

Rotated Component Matrix[a]

	Component			
	1	2	3	4
IWB_7	.853			
IWB_8	.725			
IWB_3	.710			
IWB_10	.630			
IWB_4	.617			
IWB_5		.837		
IWB_2		.653		
IWB_9		.651		
IWB_1			.793	
IWB_13			.777	
IWB_12				
IWB_6				-.737
IWB_11				.633

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.[a]

a. Rotation converged in 6 iterations.

Table 5. Coefficient Matrix showcasing the relationship between IWB and Demographic details

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	3.902	.285		13.708	.000	3.328	4.477
	Age	.003	.103	.006	.029	.977	-.204	.210
	D_WorkExp	-.010	.055	-.035	-.188	.852	-.122	.101
	B_Area	-.019	.146	-.019	-.133	.895	-.314	.276
	D_Area	.075	.047	.249	1.576	.122	-.021	.170
	B_Tech	.112	.055	.306	2.013	.051	.000	.224
	D_Tech	-.060	.049	-.183	-1.236	.223	-.158	.038
	B_Work Exp	-.118	.086	-.222	-1.376	.176	-.292	.055

a. Dependent Variable: Innovative_Work_Behaviour

Table 6. Coefficient Matrix showcasing the relationship between Innovator's DNA and demographic details

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	3.049	.287		10.624	.000	2.470	3.628
	Age	.089	.103	.172	.865	.392	-.119	.298
	D_WorkExp	-.022	.056	-.071	-.402	.690	-.135	.090
	B_Area	.045	.147	.043	.304	.763	-.253	.342
	D_Area	.100	.048	.316	2.088	.043	.003	.196
	B_Tech	.075	.056	.194	1.333	.190	-.038	.187
	D_Tech	.015	.049	.044	.310	.758	-.084	.114
	B_Work Exp	.006	.087	.011	.072	.943	-.169	.181

a. Dependent Variable: Innovators_DNA

Table 7. Regression Weights for AMOS

Regression Weights Table			Estimate	S.E.	C.R.	P	Label
IDNA Questioning	<---	IDNA_Networking	0.392	0.098	4.003	***	
Innovators DNA	<---	IDNA_Associating	0.064	0.018	3.52	***	
Innovators DNA	<---	IDNA_Observing	0.234	0.02	11.579	***	
Innovators DNA	<---	IDNA_Questiong	0.345	0.022	15.68	***	
Innovators DNA	<---	IDNA_Experimenting	0.293	0.019	15.566	***	
Innovators DNA	<---	IDNA_Non_Conformity	0.053	0.012	4.269	***	
Innovative_Work_Behavior	<---	Innovators DNA	0.535	0.154	3.468	***	
Idea_Generation	<---	Innovative_Work_Behavior	1.049	0.118	8.853	***	
Idea_Correlation	<---	Innovative_Work_Behavior	0.872	0.249	3.505	***	
Idea_Realisation	<---	Innovative_Work_Behavior	1.089	0.105	10.337	***	
Idea_Communication	<---	Innovative_Work_Behavior	0.829	0.124	6.688	***	

Table 8. Reliability statistics for non-innovators

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.710	.757	40

Table 9. Factor analysis for IDNA scores of non-innovators

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
IDNA_17	.696					
IDNA_20	.685					
IDNA_19	.680					
IDNA_18	.594					
IDNA_7	-.565			.534		
IDNA_4						
IDNA_11		.807				
IDNA_12		.651				
IDNA_9		.575				
IDNA_14			-.861			
IDNA_15			.828			
IDNA_8			.747			
IDNA_6				.869		
IDNA_5	.424			.570		
IDNA_16					.790	
IDNA_3					.635	
IDNA_1					.405	
IDNA_2						.742
IDNA_13						-.683
IDNA_10		.453				.518

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 9 iterations.

Table 10. Factor analysis for innovative work behavior for non-innovative individuals

Rotated Component Matrix[a]

	Component			
	1	2	3	4
IWB_8	.844			
IWB_9	.842			
IWB_3	.616			
IWB_10	.517			
IWB_4		.763		
IWB_12		.660	.564	
IWB_6		.634		
IWB_5		.584		
IWB_2		.535		
IWB_13			.807	
IWB_11			.725	
IWB_1				.829
IWB_7				.501

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

Table 11. Regression analysis between innovative work behavior and demographic factors

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.874	.332		11.667	.000
	D_WorkExp	.001	.048	.003	.021	.983
	B_Area	.069	.205	.055	.337	.738
	D_Area	.029	.049	.101	.592	.557
	B_Tech	-.055	.064	-.140	-.855	.398
	D_Tech	-.011	.052	-.036	-.216	.830
	B_WorkExp	-.016	.068	-.038	-.230	.819

a. Dependent Variable: Innovative_Work_Behavior

Table 12. Regression analysis between innovators DNA and demographic factors

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.330	.209		15.951	.000
	D_WorkExp	.046	.030	.242	1.551	.128
	B_Area	.085	.129	.105	.659	.514
	D_Area	.008	.031	.042	.248	.806
	B_Tech	.004	.040	.014	.088	.930
	D_Tech	.004	.032	.020	.127	.900
	B_WorkExp	.012	.043	.044	.276	.784

a. Dependent Variable: Innovators_DNA

Table 13. Amos analysis for non-innovators using PCA regression

Regression Weights Analysis			Estimate	S.E.	C.R.	P	Label
IDNA_Experimenting	<---	IDNA_NonConformity	0.324	0.147	2.195	0.028	
IDNA_Questioning	<---	IDNA_Networking	0.615	0.171	3.604	***	
Innovators_DNA	<---	IDNA_Experimenting	0.194	0.046	4.236	***	
Innovators_DNA	<---	IDNA_Questioning	0.294	0.042	7.084	***	
Innovative_Work_Behavior	<---	Innovators_DNA	0.441	0.222	1.985	0.047	
Idea_Communication	<---	Innovative_Work_Behavior	0.88	0.113	7.806	***	
Idea_Generation	<---	Innovative_Work_Behavior	1.072	0.086	12.411	***	
Idea_Realization	<---	Innovative_Work_Behavior	1.361	0.208	6.54	***	
Idea_Correlation	<---	Innovative_Work_Behavior	0.402	0.18	2.234	0.026	

Table 14. Table mentioning all the definitions of creativity and innovation

S No.	Research Paper Name	Term Used	Citation	Definition
1	Developing an Innovation Quotient	Innovation Quotient	(Buchen,2005)	Innovation does not anticipate the future, it creates it. Innovative thinking must be paired with entrepreneurial thinking as business and creative thinking go hand in hand; three innovation quotients are involved; Imitative analytical and Creative
2	How Award-Winning SMEs Manage the Barriers to Innovation	Innovation	(Larsen & Lewis,2007)	Innovation in NPD ranges in complexity from the updating of an existing product to the successful commercial exploitation of a radically new idea.
3	MONETIZING INNOVATION: How to Boost Your IQ Innovation	Innovation	(Kirk, 2010)	A 3-step process consisting of 'Getting Sparked', 'Getting Real', 'Getting Results'
4	THREE IN ONE	Innovation Quotient	(Shaker,2014)	A dreamer engenders ideas with no boundaries. A realist assesses idea feasibility. And a critic pinpoints potential risks that may threaten the concept. Wearing all three hats on a project increases your innovation quotient,
5	Creativity: Flow and the psychology of Discovery and Invention	Creativity	(Csikszentmihalyi, 2007)	Creativity is some sort of mental activity, an insight that occurs between a person's thought and a sociocultural context. It is a systemic rather than an individual phenomenon
6	The Run-Away Species	Creativity		It's a mix of Bending, Blending and Breaking
7	Need for Cognition as an Antecedent of Individual Innovation Behavior	Innovation Behavior	(Wu, Parker & Jong,2014)	Innovation behavior refers to individuals' intentional efforts to create, introduce, and apply new ideas.

Table 15. Descriptive statistics for innovators

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Innovators_DNA	50	3.05	4.65	3.8610	.43954
Unstandardized Predicted Value	50	3.90966	4.32601	4.0553846	.11895604
Valid N (listwise)	50				

Table 16. Descriptive statistics for non-innovators

Descriptive Statistics					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Innovators_DNA	50	3.10	4.30	3.6550	.24604
Innovative_Work_Behavior	50	2.83	4.83	3.9133	.38316
Valid N (listwise)	50				

Annexure III: Table of Reference

S No.	Name	Citation	Objective	Country	Sample Size/industry	Findings	Factors	Methodology	Nature of Paper
1	How does Creativity Complement Today's Currency of Innovation?	(Lewis & Wright, 2012)	A) Define the difference between creativity and innovation b) Outline the process of innovation c) Discuss the measures of innovation			Innovation is a process that is both **linear** and **cyclical**. Linear because ultimately the goal of innovation is to create a **new product, system, or service**, and is best serviced by moving **from divergent ideas to a convergent solution.** Innovation is cyclical in that the linear movement towards a solution will not happen unless the various principles of the innovation process are continuously revisited	a)Innovation is made up of 5 components -Idea finding : Observing, Experiencing and enquiring - Idea Shaping : Organizing , Simplifying and Clarifying - Idea defining : Viewing, Associating and Connecting - Idea Refining : Validating and Iterating - Idea Communicating : Feedback from all Steps b)Dependency on the Innovative Environment - Leadership - Collaboration - Early Fail Mentality		Conceptual
2	Criteria of Innovativeness and Creativity in Start-Ups and Innovative Entrepreneurship	(Vnoučková, 2018)	a) Investigate and identify approaches to entrepreneurship and innovativeness.	Czech Republic.	134 respondents across 17 projects in Start Up's were examined	Statistically significant differences between a) Age category and creativity (p = 0.048) b) Length of job history and the creativity demonstrated when performing job (p = 0.012) c) University education may cause lowering of creativity by teaching standardized thinking.	a) Innovativeness - Projects moving to the next stage b) Other Factors - Project Ownership - Age Category	Research Type a) Quantitative Research Data Collection a) Survey using a questionnaire (18 Open Ended Questions) b) Using CAWI and CATI Method Data Analysis a) Quantitative Analysis of content	Empirical
3	Measuring Employee Innovation: A Review of Existing Scales and the Development of the Innovative Behavior and Innovation Support Inventories across Cultures	(Lukes & Stephan, 2016)	a) To develop a model of employee innovative behavior and evaluate if it is a multi-faceted behavior rather than a simple count of 'innovative acts' by employees. b)To develop and validate the Innovative Behavior Inventory (IBI) and the Innovation Support Inventory (ISI).	Switzerland, Germany, Italy and the Czech Republic	2812 employees and 450 entrepreneurs were examined	Employee innovative behavior was supported as comprising of idea generation, idea search, idea communication, implementation starting activities, involving others and overcoming obstacles. **Managerial support** was the most proximal contextual influence on **innovative behavior** and **mediated the effect** of **organizational support** and **national culture**.	a) Innovative behavior factors - Idea generation - Idea search, - Idea communication - Implementation starting activities - Involving others and overcoming obstacles. b) Organization Factors - Managerial support - Organizational support - National culture.	Two pilot studies, a third validation study in the Czech Republic and a fourth cross-cultural validation study using population representative samples from Switzerland, Germany, Italy and the Czech Republic	Empirical

S No.	Name	Citation	Objective	Country	Sample Size/industry	Findings	Factors	Methodology	Nature Of Paper
4	The Kirton Adaption Innovation Inventory: A re-examination of the factor structure	(TAYLOR, 1989)	a) To provides further confirmatory evidence of the structure of the three-factor model and of the high reliability coefficients of the three subscales. b) To questions whether three factors are enough and examines four and five-factor models.	United Kingdom	305 professionally employed people, drawn from two sources. a) Group A: 119 science graduates; Research departments of four large manufacturing companies b) Group B: 186 DMS/MBA postgraduates Male to female ratio 4:1	Cognitive Approach of Innovators and Adaptors using 3 factors a) originality (13 items), b) efficiency (7 items) c) conformity (12 items)	a) Cognitive Approach of Innovators and Adaptors using 3 factors - originality (13 items), - efficiency (7 items) - conformity (12 items)	Descriptive statistics were calculated for each group separately and for the combined sample. Factors analyses were initially carried out for each group separately and for the combined sample extracting three factors. Several factoring methods have been described in the literature, including alpha factoring, principal component and maximum likelihood.	Empirical (CFA)
5	Work experience and the generation of new business ideas among entrepreneurs	(Gabrielsson & Politis, 2012)	a) To develop an integrated framework to examine how entrepreneurs' work experience is associated with the generation of new business ideas.	Sweden	291 Swedish entrepreneurs that started a new independent firm between 1998 and 2002.	a) Learning mind-set that favors exploration is the strongest predictor of the generation of new business ideas. b) Breadth in functional work experience seems to favor the generation of new business ideas while deep industry work experience is negatively related to new business idea generation. c) A learning mind-set that favors exploration is required to more fully benefit from investments in human capital.	a)Number of Business ideas - Self reporting of number of Business ideas thought and brought to life b)Depth of Work Experience - 4 independent variables c) Exploration Mindset - 5 Questions on a 5 point Likert scale d) 3 Control Variables - Formal Educational Experience - Past Experience from starting up another Firm - Individuals operating in their firms in a service industry	Collected Empirical data of 291 respondents using a survey questionnaire	Empirical
6	Innovative Work Behavior(IWB) of School Teachers: Role of Belief for Innovation and Personality Patterns	(Kundu & Roy, 2016)	a) The relation IWB with teacher's beliefs and personality b) The role of teachers' belief for innovation and personality in predicting IWB	India	400 secondary school teachers of 28 schools at Kolkata (West Bengal, India), were examined	Teacher's belief for innovation, openness, extraversion, and conscientiousness were found to be positively correlated with all the three domains of IWB i.e. idea generation, idea promotion, and idea realization. **Neuroticism was negatively correlated with idea generation**. Regression analysis revealed that **teachers' beliefs for innovation and degree of openness to new or different ideas have a potentially significant impact on IWB**	Innovative Work Behavior (9 item scale by Janssen) a) Idea Generation ; b) Idea Promotion c) Idea Realization Belief for Innovation (14 item, 5 Point scale was developed) Personality - Neo Five Factor Inventory (60 question on following) a)Neuroticism ; b)Extraversion c)Openness ; d) Agreeableness e)Conscientiousness	The sample comprised of 155 male teachers approx. 39% and 245 female teachers approx. 61%. Age range of the teachers varied from 26 to 59 years, with mean of 40.03 and SD of 9.38. Teachers in secondary schools and teachers teaching non-scholastic subjects were excluded from the study.	Empirical

Annexure III: Table of Reference (Continued)

S No.	Name	Citation	Objective	Country	Sample Size/industry	Findings	Factors	Methodology	Nature Of Paper
7	Determinants of Innovative Work Behavior: Development and Test of an Integrated Model	(Ramamoorthy, Flood, Slattery, & Sardessai, 2005)	a) To find out the Causal Model of the Relationships Between Innovative Work Behavior, Psychological Contract, Job Design and Organizational Justice	Ireland	204 employees from Irish Manufacturing Industries were examined	a)The psychological contract variable of perceived obligation to innovate, job autonomy and pay showed direct effects on IWB. b)Pay and Job autonomy also had indirect effects on IWB through the mediating variable of psychological contract – perceived obligation to innovate. c)The organizational process of meritocracy, equity perceptions and procedural justice perceptions influenced IWB through the mediating variables of psychological contract, although none of these variables influenced IWB directly.	a)Psychological Contract Met Expectations (12 Items) - Equity (2 items) - Meritocracy (3 items) - Procedural justice Perception(5 items) - Obligation to innovate (2 items) b)Perceived Job Autonomy (9 items) c)Innovative Work behavior (9 item) (Janssen)	204 blue-collar employees from the manufacturing organizations in Ireland participated in the study. Of these, 111 employees (54.4%) were men and 93 employees (45.6%) were women.103 (50.5%) of the employees had a high school certificate and the rest of the employees had junior and senior-level diplomas.	Empirical
8	The Renaissance of the Renaissance Man? Specialists vs. Generalists in Teams of Inventors	(Melero & Palomeras, 2010)	a) To argue that researchers with broad knowledge, also known as generalists, make an especially valuable contribution to innovation teams. Given the re-combinative nature of technological progress, innovation results depend crucially on the skillful matching of different pieces of knowledge.	USA	An eligible sample of 39,894 teams from 1,987 firms, located in the US, who applied for a patent in the electrical and electronics category (as defined by Hall et al., 2001) during the period 1985 to 1999.	a) Innovations patented by teams with high knowledge variety receive more citations from subsequent patents if the average individual knowledge variety of its members is also high. b) High team knowledge variety has no statistically significant effect on the relevance of the innovation if combined with low average individual knowledge breadth. c)Effect of generalists is partially mediated by the originality of the innovation.	a) Innovation - Knowledge Recombination - Communication - Conflict - Free Riding - Originality of Innovation	Hypothesis 1 Negative binomial regression model to estimate the effect of team composition on team performance Hypothesis 2 3 step process by Baron and Kenny to test mediation	Empirical
9	Do General Managerial Skills Spur Innovation?	(Custódio, Ferreira, & Pedro Matosc, 2017)	a) To show that firms with chief executive officers (CEOs) who gain general managerial skills over their lifetime of work experience produce more patents.	USA	The sample consists of S&P 1500 firms in the intersection of ExecuComp, BoardEx, and the NBER patent database. Firms that operate in four-digit SIC industries without any filed patent in the sample period are excluded.	a) They suggest that generalist CEOs spur innovation because they acquire knowledge beyond the firm's current technological domain, and they have skills that can be applied elsewhere should innovation projects fail.	a)General Managerial Ability - No. of different positions that a CEO has had during his career - No. of firms where a CEO worked - No. of industries at the four-digit SIC code level where a CEO worked, - 2 dummy variables, if worked as a CEO before b)Measurement of Innovation - No. of Patents filed - No. of citations filed c)Firm Characteristics - Firm Size - No. Of Employees - Investments - Debt to asset ratio	The GAI of CEO i in year t is defined as GAIi; t 0:268X1i; t +0:312X2i; t +0:309X3i; t +0:218X4i; t +0:153X5i; t ; (1) X1 is the No. of different positions, X2 is No. of firms, X3 is the No. of industries, X4 and X5 are dummy variables.The weights in Equation (1) are obtained from extracting common components, using principal component analysis, from the five variables.	Empirical

S No.	Name	Citation	Objective	Country	Sample Size/industry	Findings	Factors	Methodology	Nature Of Paper
10	Mapping the Impact of Social Media for Innovation: The Role of Social Media in Explaining Innovation Performance in the PDMA Comparative Performance Assessment Study	(Roberts, Piller, & Lu¨ttgens, 2016)	a) Utilizing input from social media (SM) channels can increase innovation project performance, as firms get access to novel market insights and innovative technical solutions. b) To benefit from SM for innovation, firms need to acquire new skills, procedures, and competences to interpret and evaluate the information derived from these sources. c) To establish Exploring SM without having these capabilities can even reduce performance. d) To show firms hence need to make SM part of their open innovation strategy.	England	186 companies having at least 1 social media channel	The findings indicate that utilizing information from SM channels can lead to higher performance, but that this link is influenced by the formalization of a firm's NPD process. This study also finds that the ability of a firm to benefit from external search in SM strongly depends on complementary internal processes when organizing and conducting this activity. Furthermore, managers have to take care when utilizing information from SM channels in radical projects, as for this kind of project only a weak significant performance contribution of SM could be found.	a) Innovativeness - 4 innovation variables b) Social Media - 3 Social Media Variables	Innovativeness 4 innovation performance variables were taken from the CPAS survey. Percentages were collected separately for the 3 different types of innovation and the arithmetic mean was calculated. Overall, measurement follows the logic that NPD success is based on both effectiveness and efficiency <u>Social Media</u> To measure the main construct, breadth of search using SM, two CPAS items were used which asked respondents to indicate to what extent they used 11 different SM tools, either to gather need information about customers and products, or to gather solution information to solve technical problems, using a 5-point Likert-type scale ; with each of them being coded as 1/0	Empirical
11	Need for Cognition as an Antecedent of Individual Innovation Behavior	(Wu, Parker & Jong,2014)	a) To propose a dispositional antecedent of innovation behavior that has, thus far, not been considered—need for cognition, defined as individuals' dispositional tendency to engage in and enjoy thinking b) To propose role of need for cognition depends on the context.	Australia	179 employees working in a Dutch research and consultancy organization	a) The need for cognition was positively associated with peer-rated innovation behavior, as were job autonomy and time pressure, even when controlling for openness to experience and proactive personality. b) The relationship between need for cognition and innovation behavior was strongest for individuals with low job autonomy and low time pressure and indeed was nonexistent at high levels of these contextual variables. c)This study, therefore, suggests that context can substitute for an individual's need for cognition when it comes to individual innovation.	a)Need For Cognition 3 items in the Scale developed by Cacioppo, Petty, and Kao b)Openness to experience 4 items taken from Gosling, Rentfrow, and Swann's (2003) openness personality measure. C)Proactive personality 4 items selected from the Proactive Personality Scale developed by Bateman and Crant d) Job Autonomy 6 items from Morgeson and Humphrey's e) Time pressure. 3 items for time pressure were adopted from Karasek (1979). f) Individual innovation behavior. Assessed by three nominated peers using IWB.	All employees first received an introductory letter, signed by the CEO of the organization, explaining the scholarly purpose of the research. One week later, the employees received a paper-based survey, along with a letter assuring confidentiality and providing contact information for one of the authors of this article in case of questions. This survey contained multiple-item scales for need for cognition, job autonomy, time pressure, openness to experience, and proactive personality. Over a period of six weeks, up to three reminders were sent by e-mail to those who had not yet responded. Ultimately, 189 employees participated (70% response rate)	Empirical