

Role of Macro Structural Elements of Organization Design on Innovation Performance of Indian Start-Ups

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ABSTRACT

India is in the cusp of becoming a major global innovation hub, and Indian startups have a huge role to play in driving the innovation engine. However, it is necessary that Indian entrepreneurs shun some of the traditional paradigms and adopt paradigms which are more congruent with strategies that encourage innovations. This study attempts to examine the relationship between Macro Structural elements of the Organization Design and Innovation Performance of Start-ups. The frame of reference for this study is 79 Start-Ups which have been in business for less than ten years. The average employee count of all the Start-Ups included in the sample is 57. Ordinal Regression tool has been used to establish the relationship between Organization Design elements and Innovation Performance.

Keywords: *Organization Design, Macro Structural, Start-Up, Innovation, Top Management Style, Culture & Practices, Strategic Management, Organization Structure, Effective Management of Innovation*

INTRODUCTION

Every organization is optimized to function and operate in an environment which is conducive for its growth and profitability. The extant environment is a key determinant in the strategy adopted by the decision-makers to further the interests of their businesses. However, environment is a dynamic entity that keeps altering/evolving in time, space and dimension. This requires every organizational form to alter and shape its strategy to adapt to the evolving environment in order to ensure its relevance

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and sustain profitability. This is considered as a contingency approach of Organization design and was adopted by several luminaries like Thomas Burns, Jay Galbraith, Lawrence and Lorsch, Miles and Snow and many other Organizational scientists (Puranam, 2018, p. 2). They adopted an approach which emphasized on considering an Organization as a whole and not in parts (departmental/sectional) to study its dynamic interactions with the environment. The Macrostructure of the organization is designed in congruency with a strategy which suits the environment the in which the organization is functioning.

A Start-Up company is a new entrepreneurial venture which aims to meet the marketplace needs by developing a viable business model around a product, service, process or a platform. These are usually companies designed to effectively develop and validate a scalable business model. Start-Ups have been observed to have high rates of failure, but the minority of successes include companies that have become large and influential. A lot of Start-Ups share the same origin story, a couple of close friends trying to build a company that will change the world. As the company grows, it transitions from a few friends to a team and moves out of the garage and into a real office. Whilst this is an exciting transition and usually, a positive sign, it is also the time when certain growing pains begin to emerge. For a Start-Up to survive, sustain and progress they have to synergize their structure, people, practices and reward systems to develop capabilities that give them an edge over competition. Businesses need a design which compliments speed, innovation, customer focus and improves productivity (Nadler & Tushman, 1997). Macro organizational elements like Top Management Support, Strategic Management, Flexible Organization Structure, Effective implementation of Innovation and Innovation Supportive Culture and Practices are some of the cornerstones on which the design of any organization can be constructed (Khandwalla & Mehta, 2004). Organizations, after accepting the dominant design, tend to segment and specialize their knowledge and rely on standard operating procedures to develop its products. However, when it comes to improvising or innovating in the complex business environment to survive and sustain for a longer duration, the Start-Up strategies tend to fall short of expectations.

The sensitivity to comprehend the changing environment and re-defining the organizational strategy may be feasible for big business which has dedicated teams and resources to invest for studying and recommending changes (Kimberly & Evanisko, 1981) (Nord & Tucker,

1987). However, it is the smaller Businesses, MSME and Start-Ups, which may not be able to invest the requisite focus and attention towards the changing environmental parameters with their limited resources. However, it is pertinent to mention here that, Architectural innovations place a premium on an exploration of design and assimilation of new knowledge (Kathleen Eisenhardt). Many established organizations find this type of transition difficult, but Start-Ups or new entrants with no established framework are better placed and suited to harness the potential for developing new channels and information to exploit the potential of a new design (Henderson & Clark, 1990). Large size is generally associated with greater formalization and standardization, which is inversely related to innovation and creativity (Montserrat & Entrialgo et al., 2001) . Small firms have an advantage in the area of flexible adaptations and quick response time because they do not have to contend with multiple layers of decision-makers and formal channels of approval (Block & MacMilan, 1993).

This study essentially attempts to understand the macrostructural elements of organization design and their association with innovation performance of startups. It endeavors to help them adapt to the changing Organizational Environment for ensuring their sustenance and longevity in the turbulent business environment. Although there cannot be a readymade/templated solution for the problems, certain guidelines can be extracted from this research.

LITERATURE REVIEW

Seminal works of various Organizational Scientists have emphasized the importance of organizational transformation which is congruent to the environmental demands. It has been concluded that environmental jolts in an organization facilitate revolutionary transformation (Meyer, 1982). It was emphasized that a business needs a design that complements speed, innovation, customer focus and radically improved productivity (Nadler & Tushman, 1997). Organization designs need to be such that they are easily reconfigurable as per the requirement of the business (Galbraith, 2014). Start-Up organizations represent powerful engines of open innovation process (Spender et al., 2017). Hence, the primary focus of small firms and startups, functioning in a turbulent environment is to constantly innovate.

A number of common innovation determinants at a macro organizational level have been identified in the study done by (Khandwalla

& Mehta, 2004) the primary ones are – innovation supportive strategic management, management support for Innovative culture, customer market focus and human resource strategies, culture and practice that emphasize innovation. Besides this the relevance of some other major factors viz. High Levels of External and Internal Communication Networking, Flexible Structure and Strategic posture are also highlighted by Read (Read, 2001). In his study Fariborz Damanpour (Damanpour, 1991), undertook a meta-analysis of the relationships between organizational innovation and 13 of its potential determinants which resulted in statistically significant association for managerial attitude towards change, internal and external communication, administrative intensity and professionalism among other factors. In their seminal work (Bookholdt & Service, 1998) surveyed the literature, Organizational innovations and identified eight broad factors that affect innovativeness; namely environmental factors, Management styles, Structure of the organization, Organizational Human resource management, key innovation promoters, culture and work climate and lastly the marketing and customer's response system. In their study, examining the relationship between Organizational structure and Innovation performance of small firms, Andy Cosh, Xiaolin Fu and Alan Hughes (Cosh et al., 2012) asserted that Decentralized decision making, supported by a Formal structure and Written plans, support the ability to innovate in most circumstances and is associated with superior performance than other structures in small firm economies.

Manimala's (Manimala, 1992) study of 167 entrepreneurial case studies highlight a sharp difference between a Pioneering Innovative (PI) Entrepreneur and Ordinary Entrepreneur. The PI Entrepreneurs opts for markets and market segments where they have an assured first mover's advantage, likelihood of inducting experts on board and extensive networking. They enter joint ventures only after great deal of homework and capability development. They also augment the professionals in their management as their units grow larger. (Khandwalla, 1985) in his ground-breaking study for policy frameworks using a sample of 75 companies yielded a specific framework that he labelled as 'Pioneering Innovative'. This consisted of a group of policies that favored Pioneering of novel technologically sophisticated high-quality product in Indian markets, emphasis on Innovation and Experimentation in all operations of the organization, Entrepreneurial risk-taking, Operational flexibility and Hiring of creative youngsters with considerable responsibility and flexibility. Khandwalla also identified three top management styles that

had largest correlation with organization related innovativeness viz. the Entrepreneurial style of pursuing big but risky growth opportunities, the Organic style that emphasizes on improvisation and operational flexibility and the Participative style of decision making. Mehta and Khandwalla (Khandwalla & Mehta, 2004) proposed a model establishing strong association between superior corporate creativity in a regime of intensifying Environmental Pressures and Innovation friendly Business strategies, Organizational Structure, Top Management style, Middle Management Practices and Effective modes of Managing innovations.

MACRO-STRUCTURAL ORGANIZATION DESIGN VARIABLES

The variables used to measure the organization design elements are listed below:

- *Innovation Supportive Strategic Management*: Start-ups are entrepreneurial venture with fast growing business and offering innovative products, processes and service. For startup ventures entrepreneurship carried on in pursuit of business opportunities spur business expansion. Ozsomer et al. (Ozsomer et al, 1997) maintained that strategic posture is the most important factor in increasing innovation. ‘Prospector’ type of management would tend to see more opportunities than threats through change and innovation (Miles & Snow, 1978). Most of the firms in their nascent state adopt Entrepreneurial Orientation is revealed through firm’s characteristics, as maintained by (Miller, 1983, p. 771) “An entrepreneurial firm is one that engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with ‘proactive’ innovations, beating competitors to the punch.” Siggelkow (Siggelkow, 2002), insists on wide product variety for innovation success of the firm “flexible manufacturing system and wide variety are complementary elements, reinforcing each other, the wider the product variety, the more valuable are investments in increasing flexibility of manufacturing system and conversely the more flexible the manufacturing system, the greater the benefit (Miller, 1983, p. 771; (Milgrom, 1982)). People in innovative organizations understand the value created by developing and maintaining a long term working relationship with customers and indeed this image of work as the practice is part of their identity as organisation (Dougherty,

1992). Five scales were constructed and scores were aggregated to measure this variable.

- *Innovation Supportive Top Management Style:* As per Norbert Thom (Thom, 1990), the approach of the entrepreneur and managers regarding readiness to innovate, implementing the change, attitude towards risk-taking, ability to delegate and open communication creates a climate for open innovation. Communication to stakeholders regarding the vision of growth, dynamic managers at the helm, global scanning for fresh growth, joint ventures and collaboration are practices which inculcate entrepreneurship (Khandwalla, P., 1992). Top management is urged to create an organisational climate in which honest failures are tolerated, creativity is rewarded and inter-functional and inter-divisional barriers are lowered to facilitate innovation across the organisation (Kanter, Kao & Wiersema, 1997). Lumpkin and Dess (Lumpkin & Dess, 1996) asserted that the dimensions of entrepreneurial orientation are autonomy, innovativeness, risk-taking, proactiveness, competitive aggressiveness. Nine scales were constructed and their scores were aggregated.
- *Flexible Organization Structure:* Andy Cosh (Cosh et al., 2012) in his study of small firms stressed that small firms perform well with an informal and decentralized structure. The organic structure is best suited for turbulent environments (Burns & Stalker, 1961), this theory found much support by many noted organization scientist (Covin & Slevin, 1989). Organizations functioning in diverse and intense competitive pressure and turbulent environment perform well with decentralized decision making, group problem solving and sophisticated control system (Khandwalla, 1977) *The Design of Organizations*. In his study conducted on the economic environment (Blau, 1973) found that decentralisation and program innovation were positively related. Decentralization promotes an environment where ideas are easily generated (Kumar, 2009). It is extremely likely that in a large organization the ideas get screened out or resources get denied, thus reducing the opportunities for innovations (Pierce, 1977). (Russell & Russell, 1992), contends that decentralisation results in increased participation, which in turn enhances the organisation members commitment to new idea and innovation process. Eight scales were drawn from the literature above and were aggregated to get a score for this variable.

- *Effective Management of Innovation:* An aggregated score of six scales was used to measure this scale. Keogh (Keogh, 1999) in his study of Scottish SME's stated that effective human resources and nurturing knowledge help in increasing the propensity of innovation. As per Khandwalla (Khandwalla, 1992) "conservatism traditionalism, conformity dependency proneness, rules orientation are strong in many third world countries while organizational learning, behavioral science mechanism and forceful leadership can go a long way in counteracting these forces of status quo, they may not go far enough. Creativity flourishes in a stimulating, challenging, diverse, permissive operating environment. Thus, general global varied missions are more likely to spur organizational creativity than a narrow specific single-track mission. Six scales were inferred from the above literature and measured.
- *Innovation Supportive Practices and Culture:* An aggregated score of five scales was used to measure this variable. Mc Gourty et al. (McGourty et al., 1996) and Hurley and Hult (Hurley & Hult, 1998) in their study of US companies suggested that an innovative culture facilitates innovation. Raw creativity is insufficient, knowledge of demand and technology of production as well as execution capacity are important ingredients for propelling innovation (Puranam & Kumar, 2012). Triguero and Corcoles (Triguero et al., 2014) analyzed the effect of persistence of innovation on employment in Spanish manufacturing firms during the period of 1990-2008. In their paper "Persistence of Innovation and Firm's Growth: Evidence from a panel of Spanish manufacturing firms" They use a GMM - system estimation to study the importance of persistence of product and process innovation on employment growth, controlling by potential endogeneity and unobserved firm heterogeneity. The empirical results indicate that process innovation measures show a positive effect on employment, while the effect of product innovation is positive but not significant. New knowledge skills can be acquired through external networks and other formal relationships with external parties and start-up firms have to constantly emphasize on the generation of fresh ideas. Such ideas can stimulate new products by enhancing the firm's own capacity to process and to apply its own knowledge (Zahra & George, 2002).

INNOVATION PERFORMANCE MEASURES

This performance measure concerns with the commercial viability of innovation. This measure has been used in earlier studies also for performance analysis of innovation (Cosh et al., 2012) (Laursen & Salter, 2006). It measures the percentage of annual turnover due to new or significantly improved products which were innovated in the last three years. Percentage of turnover was segregated in different categories, such as 1%-15%, 15%-30% and Above 30% assigned to different range of innovation performance, which was subsequently dummy coded to run ordinal regression.

DATA AND VARIABLES USED

Data for this study was drawn from the interactions and inputs of founders and top executives of major Start-Ups through convenience and random sampling. In addition, online publications, offline journals and newspapers were used to identify the relevant Start-Ups at various stages of their funding. The founders/executives of these selected Start-Ups were contacted through social media and mails for compiling the relevant data. The data was collected through a questionnaire on a 5-point scale.

The government definition of a start-up is an entity incorporated or registered in India, which is not more than 7 years old, with an annual turnover not exceeding 25 crores in any preceding financial year, working towards innovation development, deployment or commercialisation of new products and processes or services driven by technology or intellectual property. However, this definition is only applicable only for government enlisted start-ups.

For the context of this study, the researcher has considered start-ups as companies which are younger than 10 years which has innovative technology or business model and have to strive for significant employee and/or sales growth” (Kollmann, 2016). Start-ups which were at least two years old were included in the study because most of the start-ups fail within two years of their life (Giardino, 2014), size of the firms included in the sample ranged from six employees to 350 employees. The average employee count of all the Start-Ups included in the sample is 57.

The questionnaire of 33 questions was prepared after an extensive literature review. The macro-structural factors affecting organization design were adopted from works of various researches like (Khandwalla

& Mehta, 2004), (Cosh et al., 2012), (Thom, 1990), (Damanpour, 1991), (Henderson & Clark, 1990), (Galbraith, 2014). The statements were constructed on the basis of literature from previous researches. Five constructs and their effect on innovation performance of the firm were extracted to study in this research.

- Innovation Supportive Strategic Management
- Innovation Supportive Top Management Style
- Flexible Organization Structure
- Innovation Supportive Practices and Culture
- Effective Implementation of Innovation

RESEARCH QUESTION AND HYPOTHESIS

The aims of this study is to understand the commercial viability of Innovations and their relationship with Organization Design elements. Hence the following hypothesis were drawn from for the literature reviewed:

Macrostructural elements of organization like:

H1 - Innovation Supportive Strategic Management has a significant association with the Innovation Performance of Start-up firms.

H2 - Innovation Supportive Top Management has a significant association with Innovation Performance of start-up firms.

H3 - Flexible Organization Structure has a significant association with Innovation Performance of start-up firms.

H4 - Innovation Supportive Practices and Culture have a significant association with Innovation Performance start-up firms.

H5 - Effective Management of Innovation has a significant association with Innovation Performance.

DATA ANALYSIS

After collection, the data was subjected to data synthesis in order to identify the missing variables and clean the redundant data. Reliability was verified with the help of Cronbach's alpha. As the questionnaire measured different constructs hence questionnaire of each construct was developed separately. The reliability all the constructs except organisation structure was found to be above .80 which is considered to be reliable (Table 1). Organisation structure had the Cronbach Alpha of 0.64, which is also considered reliable (Griethuijsen et al., 2015).

Table 1: Reliability Analysis

	Cronbach's Alpha	No. of Items
Innovation Supportive Strategic Management	.876	6
Innovation Supportive Top Management	.930	9
Innovation Supportive Organisation Structure	.645	8
Innovation Supportive Practices and Culture	.911	5
Effective Management of Innovation	.877	6

ORDINAL REGRESSION

After establishing the reliability of data, ordinal regression was processed to understand the association between the determinants of organisation design and innovation performance. Table 2 shows the sample included in the analysis. The model fitting information which is shown in Table 3 reflects that before introducing the dependent variable -2 log-likelihood of model was 150.78 and after introducing the dependent variable the -2 log-likelihood of the model reduced from 150.78 to 114.38 explaining the significant of predictor variables. -2 log-likelihood is analogous to the residual sum of squares in multiple regression (Field, 2013). And the likelihood ratio that is chi-square statistic is 36.405, signifying that at least one of the predictors regression coefficients is not equal to zero in the model. The difference of freedom in the table denotes number of dependent variables in the model.

Table 2: Case Processing Summary

		N	Marginal Percentage
Turnover due to Innovation	1.00 (Above30%)	45	57.0%
	2.00 (15%-30%)	23	29.1%
	3.0 (1%-15%)	11	13.9%
Valid		79	100.0%
Total		79	

Table 3: Model Fitting Information

-2 Log-Likelihood	Chi-Square	df	Sig.
150.787			
114.381	36.405	5	.000

Table 4 shows the goodness of fit of model. Maximum number of respondents marked their turnover due to innovation to be more than 30%. And if higher categories are more probable, then complementary log-log function of ordinal regression is used and significance value of greater than 0.5 shows that the model is a good fit. In this model Pearson's and Deviance goodness of fit is more than 0.5, which shows there is goodness of fit for this model.

Table 4: Pseudo R-Square

Cox and Snell	.369
Nagelkerke	.434
McFadden	.241

Link function: Complementary Log-log.

Table 5 reports pseudo R square which explains the strength relationship between the dependent and independent variable.

Table 6 shows the parameter estimate. Threshold represents the percentage of turnover due to innovation in the last 2 years. Estimate explains ordered log-odds estimate one unit increase in the dependent variable score on expected turnover due to innovation. The exponent of estimate explains the odds ratio. Hence one unit increase in the score of strategic management, top management style, organisation structure, practices and culture, effective management of innovation would increase the odds ratio of turnover due to innovation by the exponent of -0.58, -1.10, -0.77, 0.016, 0.011 respectively.

Table 5: Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	158.723	151	.317
Deviance	114.381	151	.988

Link function: Complementary Log-log.

Table 6: Parameter Estimate

		Estimate	Std. Error	Wald	df	Sig.
Threshold	[Turnover due to Innovation above 30% = 1.00]	-7.256	1.789	16.452	1	.000
	[Turnover due to Innovation 15%-30% = 2.00]	-5.984	1.713	12.204	1	.000
Location	Strategic Management	-.058	.043	1.779	1	.182
	Top Management Style	-.110	.041	7.083	1	.008
	Flexible Org. Structure	-.077	.042	3.291	1	.070
	Practices & Culture	.016	.071	.048	1	.826
	Effective Management of Innovation	.011	.051	.048	1	.827

The p-value is significant only for top management which is 0.08.

Table 7 shows the test of parallel lines. Test of parallel lines is based on the assumption that the slope of coefficients in the model is the same across response categories. If the null hypothesis was to be rejected based on the significance of chi-square statistic, it can be concluded that ordered logit coefficient is not equal across the levels of outcome and a less restrictive model would be a better fit. However, for this model, the proportional odds assumption can be held because the significance level of the chi-square statistic is .297 which is greater than 0.05.

Table 7: Test of Parallel Lines

Model	-2 Log-Likelihood	Chi-Square	df	Sig.
Null Hypothesis	114.381			
General	108.289	6.092	5	.297

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.

Link function: Complementary Log-log.

RESULTS AND DISCUSSION

The ordinal regression analysis was conducted because the dependent variable was divided in categories assigned to different range of

performance levels. It examined the association of Macrostructural variables of Organization design with Innovation performance as shown in Table 3 and Table 4. Table 5 and Table 6 and Table 7. Table 6 shows that top management style has a significant association with Innovation Performance, thereby proving hypothesis H2 is supported by the findings of the analysis. However, other factors like Strategic Management of Innovation, Flexible Organization Structure, Practices and Culture and Effective Management of innovation have not been found significantly influencing Innovation Performances in Start-Ups. Hence, the hypothesis H1, H3, H4 and H5 are not supported by the findings of this analysis. It can be stated that innovation performance in an Indian startup is significantly associated with top management style of startups. This conclusion finds support in Hofstede's cultural model which suggests that India is a patient country with tolerance towards uncertainty and risk-taking propensity of Indians is not low, which is good for business environment. Entrepreneurial style of top management or the 'Prospector' types (Miles & Snow, 1978) of management believes in taking calculated risks, continuously scanning the market and readiness to delegate.

The Table 6 does not indicate a significant association between Innovation Supportive Strategic Management, Flexible Organization Structure, Practices and culture and Effective management of association with Percentage of Annual Turnover due to new or significantly improved innovative products/service introduced between 2016 and 2018. A study of 65 Indian corporate organizations also showed less correlation between Organization structure and Innovation performance (Khandwalla & Mehta, 2004). Redesigning organizations to facilitate corporate creativity is not easy in cultures that are traditional and authoritarian (Khandwalla & Mehta, 2004). The researcher also collected after the subsequent discussion with the founders that they preferred centralized and formal structure in the early stages of their establishment. An interesting anomaly was to see low association between Strategic Management and Innovation performance. This suggests that Strategic management or at least its dimensions measured in the study plays a much smaller role in the innovation performance of the Indian Start-ups.

Performances can be maximized if human resource policies and practices adopted are consistent with business strategy, implying that business strategies are followed by HRM policies in determining business performance (Schuler & Jackson, 1987). Similar views have been stated by Baird and Meshoulam (Baird & Meshoulam, 1987), the alignment of redesign processes and HR practices allows organizations

to achieve superior performance. Effective reward management, careful planning, phasing and reviewing innovations, realistic appraisals and extensive communication are the measures which can help in the effective management of innovation. Establishing a culture is typically a much more difficult task than establishing any other aspect of the organisation, it takes determined and consciously planned effort over a long period of time. Mutual trust, risk-taking and tolerance for mistakes become key cultural values in an innovation-centric organization (Daft, 2012, pp. 342-349). Most of the startups participating in the study are in the nascent stage of their establishment and it would take years for them to establish a proper culture and the practices which are innovation-centric. Management emphasis on a fresh generation of key ideas and increasing the frequency of innovation, recruitment of bright, innovative and young professionals, help in developing a culture which where ideas are rapidly translated into actions and positive business results.

Most Indian Start-Ups are still in their inceptive stage but are showing growth in the right trajectory. With proper plans related to goals and execution on these goals through delegation, teamwork and proper mentorship, Indian start-ups can become prospectors in true sense.

LIMITATIONS AND SUGGESTIONS

As mentioned earlier this is a study which establishes the association between macrostructural elements of organization design and their innovation performance. Although, the present study made an attempt to understand the innovation phenomena in context with organization design, however, the innovation in Start-Ups is ambiguous and still remains to be defined. The study provides further scope for large samples and controlled sample size of Start-Ups specializing in specific areas. This will enable us to understand the antecedents of macro structural elements of organization design with innovation performance in Start-Ups as the result. Further, comparative research can be carried out between tech and non-tech Start-Ups also.

REFERENCES

- Baird, L., & Meshoulam, I. (1987). Managing two fits of strategic human resource management. *The Academy of Management Review*, 13(1), 116-128.

- Blau, P. (1973). *The organization of academic work*. New York: John Wiley & Sons.
- Block, Z., & MacMilan, I. (1993). *Corporate venturing*. Harvard Business School Press.
- Bookholdt, R. W., & Service, J. L. (1998). Factors leading to innovation: A study of managers perspectives. *Creativity Research Journal*, 11(4), 295-307.
- Burns, T., & Stalker, G. (n.d.). *Innovation, market orientation and organizational learning*.
- Chesbrough, H. (2011). Bringing open innovation to services. *MIT Sloan Management Review*, 52(2).
- Cosh, A., Fu, X., & Hughes, A. (2012, September). Organisation structure and innovation performance in different environments. *Small Business Economies*, 39(2), 301-317.
- Covin, J., & Slevin, D. (1989, February). Strategic management in small firms in hostile and benign environments. *Strategic Management Journal*, 10(1), 75-87.
- Daft, R. (2012). New Delhi: Cengage Learning Pvt. Ltd.
- Damanpour, F. (1991, September). Organizational innovation: A meta-analysis of effects of determinants and moderators. *The Academy of Management Journal*, 3(3), 555-590.
- Dougherty, D. (1992, May). Interpretive barrier to successful product innovation in large firm. *Organisation Science*, 3(2), 179-202.
- Felin, T., & Powell, T. (2016). Designing organizations for dynamic capabilities. *California Management Review*, 58(4), 78-96.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. London: Sage Publication.
- Galbraith, J. (2014). *Designing organizations: Strategy structure and process at the business unit and enterprise levels* (3rd ed.). John Wiley Sons.
- Giordano, C. (2014). What do we know about software development in startups? *IEEE Software*, 31(5), 28-32.
- Griethuijzen, R. A. L. F. V., Eijck, M. W. V., Haste, H., Brok, P. J. D., Skinner, N. C., & BouJaoude, S. (2015, November 9). Global patterns in students' views of science and interest in science. *Research in Science Education*, 45(4), 581-603.
- Gupta, P. (2006, April 1). Institutionalizing innovation for growth and profitability. *Journal of Private Equity*, 9(2), 57.
- Henderson, R. M., & Clark, K. B. (1990). Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. *Administrative Science Quarterly*, 36.

- Hurley, R. F., & Hult, T. (1998). Innovation, market orientation and organizational learning: An integration and empirical examination. *Journal of Marketing*, 62(3), 42-54.
- Jacob, N. (1998). *Creativity in organizations*. New Delhi: A. H. Wheeler.
- Jaikumar, R. (1986). Postindustrial manufacturing. *Harvard Business Review*, 64(6), 69-76.
- Kanter, R., Kao, J., & Wiersema, F. (1997). *Innovation: Breakthrough thinking at 3M, GE, DuPont, Pfizer and Rubbermaid*. New York: HarperCollins.
- Keogh, W. (1999, June). Understanding processes and adding value within innovative small firms. *Knowledge and Process Management: The Journal of Corporate Transformation*, 6(2), 114-125.
- Khandwalla, P. (1977). *The design of organizations*. Harcourt Brace Jovanovich.
- Khandwalla, P. (1985, April 1). Pioneering innovative management: An Indian excellence. *Organization Studies*, 6(2), 161-183.
- Khandwalla, P. (1992). *Organizational designs for excellence*. New Delhi: Tata McGraw Hill.
- Khandwalla, P., & Mehta, K. (2004). Design of corporate creativity. *Vikalpa*, 29(1), 13-28.
- Kimberly, J., & Evanisko, M. (1981). Organization innovation: The influence of organizational and contextual factors on hospital adoption of technological and administrative innovations. *Academy of Management Journal*, 24, 689-713.
- Kollmann. (2016). *European startup monitor report* (pp. 1-112). Retrieved from <https://duepublico.uni-duisburg-essen.de/?lang=e>
- Kumar, S. (2009). Architecture of innovation and change: An integrated model. Working Paper. Retrieved from SSRN.
- Laursen, K., & Salter, A. (2006). Open for innovation: The role of openness in explaining innovation performance among UK manufacturing firms. *Strategic Management Journal*, 27, 131-150.
- Lawrence, P., & Lorsche, J. (1967). Differentiation and integration in complex organizations. *Administrative Science Quarterly*, 12(1), 1-47.
- Lumpkin, G., & Dess, G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review*, 21(1), 135-172.
- Manimala, M. J. (1992, November). Entrepreneurial heuristics: A comparison between high PL (pioneering- innovative) and low PI ventures. *Journal of Business Venturing*, 7(6), 477-504.

- McGourty, J., Tarshis, L., & Dominick, P. (1996). Managing innovations: Lessons from world-class organizations. *International Journal of Technology Management*, 11(3), 354-368.
- Meyer, A. D. (1982, December). Adapting to environmental jolts. *Administrative Science Quarterly*, 27(4), 515-537.
- Miles, R. E., & Snow, C. C. (1978, July). Organizational strategy, structure and process. *Academy of Management Review*, 3(3).
- Milgrom, R. (1982, August). Predation, reputation and entry deterrence. *Journal of Economic Theory*, 27(2), 280-312.
- Miller. (1983). Correlates of entrepreneurship in three types of firms. *Management Science*, 29(7), 770-791.
- Nadler, D., Tushman, M., & Nadler, M. (1997). *Competing by design*. Oxford University Press.
- Nord, W. R., & Tucker, S. (1987). *Implementing routines and radical innovations*. Lexington Books.
- Ozsomer, A., Calantone, R., & Benedetto, A. D. (1997). What makes firms more innovative? A look at organizational and environmental factors. *Journal of Business and Industrial Marketing*, 12(6), 400-416.
- Pierce, J. (1977). Organization structure, individual attitudes and innovation. *Academy of Management*, 2(1), 22-37.
- Puranam, P. (2018). *Microstructure of organisations*. Oxford University Press.
- Puranam, P., & Kumar, N. (2012). *India inside: The emerging innovation challenge to the west*. Harvard Business Press.
- Read, A. (2000). Determinants of successful organizational innovation: A review of current research. *Journal of Management Practice*, 3(1), 95-119.
- Russell, R., & Russell, C. (1992). An examination of effects of organizational norms, organizational structure and environmental uncertainty on entrepreneurial strategy. *Journal of Management*, 18(4), 639-656.
- Schuler, R., & Jackson, S. (1987, August). Linking competitive strategies with human resource management practices. *Academy of Management Executive*, 1(3), 207-219.
- Siggelkow, N. (2002, March). Evolution towards fit. *Administrative Science Quarterly*, 47(1), 125-159.
- Snow, C., & Miles, R. (1978). Organization strategy, structure and process. *The Academy of Management Review*, 3, 546-562.
- Spender, J. C., Corvello, V., Grimaldi, M., & Rippa, P. (2017). Startups and open innovation: A review of literature. *European Journal of Innovation Management*, 20(1), 4-30.

- Thom, N. (1990). Innovation management in small and medium-sized firms. *Management International Review*, 30(2), 181-192.
- Triguero, A., Córcoles, D., & Cuerva, M. C. (2014). Persistence of innovation and firm's growth: Evidence from a panel of SME and large Spanish manufacturing firms. *Small Business Economics*, 43(4), 787-804.
- Zahra, S., & George, G. (2002). Absorptive capacity: A review, reconceptualization and extension. *The Academy of Management Review*, 27(2), 185-203.