

Examining the relationship between organization structure and innovation:

A study of Indian corporations

Anjan Bhowmick

Academy of HRD, Ahmadabad

Keith C. D'Souza

Professor of Organizational Behavior

S.P. Jain Institute of Management and Research, Mumbai

Upasana Agarwal

Assistant Professor

National Institute Industrial Engineering, Mumbai

Abstract

This study examined the relationships between innovation in organizations and key organization structure characteristics of vertical and horizontal complexity, formalization, centralization, delegation of authority and participative decision making in the context of Indian industry in the manufacturing and services sector.

Perceived Innovation was taken as a surrogate measure of innovation. Data were collected through a questionnaire survey of perceived innovation, from 198 managers working in 8 Indian corporate sector organizations spread across manufacturing and services. Regression equation, correlation analysis and one way ANOVA test for demographic variables were used to analyze the strength of the relationships.

The results indicated that organization structure impacts innovation. The organization structure dimensions of vertical and horizontal complexity, degree of formalization, delegation of authority and participative decision making, correlate positively with innovation, whereas centralization correlates negatively with innovation.

The findings of the study may be limited by the cross-sectional design and use of self-report questionnaire data. Furthermore, since the study focused on only two sectors of industry there is scope to study the above mentioned relationships in emerging sectors such as pharmaceutical, biotechnology, hospitality etc., and therefore should be interpreted with caution.

The results of this study highlight the possible organization structure requirements for successful innovation in Indian corporations.

Keywords – Innovation, perceived innovation, vertical and horizontal complexity, formalization, centralization, delegation of authority, participative decision making and organization structure.
Paper Type – Research Paper.

Introduction:

The economic environment in India over the past couple of decades has compelled a shift in business strategies from a market-push to a market-pull based strategy. While, earlier, demand was high and supply scarce, the reversal of the trend to a high-supply-lower-demand situation has led to a competitive environment, posing considerable challenge to business organizations (D'Souza and Bhowmick, 2012). Faced with escalating customer expectations, organizations have had to go back to their drawing boards to analyze how to adjust quickly and adopt new ways to remain competitive. The view is clear: firms need to design structure, strategy and systems to instill a culture of innovation to compete and perform in the market place.

Lately, it has been observed in the industry that key players in the market are discarding archaic models which prioritize the urban market over the rural market, and have come out with vastly more insightful segmentation models focusing on rural markets too. In the urban markets, they are altering the dialogue with modern retailers and the emerging specialized trade channel customers in ways as to grow the market and value share. To do all this, corporations are in the process of creating a flexible and lean supply chain which can access more consumer segments and satisfy more consumer requirements. They are using technology to both, win over and collaborate more intensely with the consumers to create innovative products (Booz&Co., 2010).

Traditionally, the competitive advantage of organizations depended upon factors such as size, brand-name and possession of assets. In recent years, the pattern has shifted to favor those organizations that can mobilize their technical skills, knowledge and experience, to innovate products, processes and services (Kay, 1993). Research on small and medium sized enterprises has shown that measures of success based on growth, profitability and productivity are highly correlated with

emphasis on innovation (Baldwin et al., 1994). Successful new innovations are an important way for organizations to adapt to changes in the market place, technology and competition. For example, new products created as a result of design, customization and quality enhancements, help to capture and retain market share and improve profitability of firms (Sounder and Sherman, 1994). In the world of shortened product life circles, being able to replace or modify products more quickly with newer and better versions becomes imperative to remain competitive (Stalk and Hout, 1990). Innovation to create new and improved products is also important to meet the changing needs and desires of customers.

India has gained dramatically courtesy our attitude towards population, entrepreneurs, the English language, globalization and democracy in the liberalization era post 1991. It has made India a country that right now has a unique cadence, where all our major strengths have come together and matured at the same time (Nilekani, 2010). Mere recognition of this convergence would not be enough. The market place looks busy and every firm is vying for a bigger share of the pie. Therefore Indian companies, in order to effectively perform in the market place, have needed to innovate towards more 'evolved' and sophisticated product forms, healthier variants of existing products and enhanced portfolios to introduce a much larger variety suited to different consumer groups (CII-Booz, 2010).

Research interest among organizational scientists dealing with innovation in the workplace, has shown no signs of abating over recent years. The range of empirical studies into innovation processes and idea implementation has continued to develop over the last few decades in response to the changing nature of work organizations, and there has been an increased emphasis upon work groups' innovation (Amabile, 1983; Van DeVan, Angle & Pool, 1989; West, 2002). Innovation research has flourished over the last 30 years triggered by the movement of organizations away from

the previous dominant forms of structure and Taylorian job specifications, towards more flexible, lean and flat structures (Howard, 1995; King and Anderson, 2002). Innovation, both in products and processes, is an important condition for the competitive success of a firm. Furthermore, recent research has suggested that innovativeness contributes to business performance (Despande et al., 1993; Hult et al., 2004; Hurley, 1995; Tajeddini et al., 2006). Because of its potential effect on business profitability and differentiation, innovativeness plays a key role in the formation of business strategy. What comes out clearly is that with today's intense competitive pressure, many companies are looking for new ways to handle what were previously considered standard management practices.

The literature review conducted for the purpose of this study, suggest that some organization structure variables may be particularly important for influencing innovation in organizations. This study focuses on six of them, namely: horizontal complexity, vertical complexity, formalization, degree of centralization, delegation of authority and participative decision making. The research model tested in this study is illustrated in Figure 1 below.

The study addresses the growing need to explore intra-organizational attributes impacting innovation (Ahuja, Lampert & Tandon, 2008). For organizations in the emerging economies like India, this may be particularly important since the emergence and growth of organizations are a corollary to economic development. It would be timely to examine what organizational structure forms may be especially relevant to encourage innovation.

Concept of Perceived Innovation:

Perceived innovation is one of the measures of innovation among many others like expense spent on innovation, proportion of sales of innovative products, and numbers of patents filed at a particular point of time. In this study, we have used perceived innovation as a surrogate for innovation.

Perceived Innovation measures the perception of employees of how innovative they consider their organization to be, the extent to which activities and processes are positive and facilitative for innovation, and the approach of their organizations towards innovation/innovating. There is very little literature available in documented form which studies the concept of perceived innovation, hence, it may be considered a unique concept in innovation literature. In a study of 339 organizations, Bart (2004) measured firm-level innovation by asking respondents to indicate, using a 10-point scale, how innovative they perceived their organizations to be, and how important innovation was to their organizations. The concept of perceived innovation which the present study uses as a surrogate for innovation, is the same as Bart's (2004) measure of firm-level innovation. The same concept was used by Yamini and Gupta (2010) to assess innovation in manufacturing industries in India.

Organizational Variables Affecting Innovation

A number of external and internal factors affect innovation (Ahuja, Lampert & Tandon, 2008). External factors include government policies, industry structure, and institutional influences (Arora & Gambardella, 1990). Among the intra-organizational factors, organization climate and organization structure are two key sets of variables (Ahuja, Lampert & Tandon, 2008). Since this paper is limited to studying one of the two key intra-organizational factors, the authors have chosen to study the organization structure dimensions, which constitute a critical component of the intra-organizational factors impacting innovation. Organization structure is one of the most visible elements of organization form, which, when assessed, could bring out the preparedness of an organization towards innovation (Yamini & Gupta, 2008).

Organizational Structure

Structure is the most significant factor which can be modified to impact innovation inside an organization. It is directly under the control of organizational decision makers to influence. Structure may be considered the anatomy of the organization, providing the foundation within which the organization functions. Organization structure is believed to affect the behavior of organization members. As Hall (1977) noted, this belief is based on a simple observation: buildings have halls, stairways, entries, exits, walls and roofs. The specific structure of a building is a major determinant of the activities of the people within it. Similarly, behavior in organizations is influenced by the organization's structure. The influence of this structure, while not as apparent as that of a building, is assumed to be pervasive. All organizations have a structure.

Hall (1977) suggested that a structure has two basic functions, each of which is likely to affect individual behavior and organization performance: first, structures are designed to minimize or at least regulate the influence of individual variations on the organization, and second, structure is the setting in which power is exercised, decisions are made and the organization's activities are carried out. Van de Ven (1976) highlighted the importance of structure both at the organization and subunit levels for the performance (efficiency, effectiveness and morale) of the organization.

Organization structure has been subject to journal reviews in the past (Cummings and Beyer, 1976; Ford and Slocum, 1977; James and Jones, 1976; Ouchi and Harris, 1974; Scott, 1975) and has been the topic of several books (Burack and Nughandhi, 1977; Grabraith, 1977; Khandawalla, 1977; Kilman, Pondy and Slevin, 1976; Mackenzie, 1978; Melcher, 1976; Pfeffer, 1978). However, the association between structural variables and innovation has received little attention (Dalton, Todor & Porter, 1980).

In line with Pertusa-Ortega et al.'s (2010) approach, the current study relies heavily on the combination of strategy-structure- performance (SSP) and resource – based- view (RBV) of the firm. Early SSP literature argued that changes in the firm's strategy will cause changes within the organization structure so that strategy can be properly developed and higher performance achieved (Chandler (1962), Rumelt (1974), Sujuki (1980)). Therefore, organization structure cannot be regarded exclusively as an element of strategic implementation. Instead, managers should consider it as an element of strategy formulation, as a resource, which can help improve performance (Pertusa, Ortega, et al., 2010).

Components of organization structure are usually included in the firm resource category called Organization Capital Resource (Barney, 1991) or Organization Resource (Grant, 1991). For example, Barney (1991) points out that organization capital resource includes a firm's reporting structure, its formal and informal planning controlling and coordinating systems. Penrose (1959) was among the first to recognize and document the importance of resources in relation to a firm's competitive position. As Newbert (2007, p 122) states, Penrose argues that a firm is a collection of productive resources that contribute to a competitive position to the extent that they are exploited in such a manner that their potentially valuable services are made available to the firm. Resources are of interest because of what can be done with them. Specifically, resources can be displayed to develop capabilities (Amit & Schoemaker, 1993) which, in turn, are linked to performance. The relationships among resources, capabilities and performance are summarized by Newbert (2008). Newbert's synopsis is based upon earlier works by Amit and Schoemaker (1993), Barney (1991, 1997), Eisenhardt and Martin (2000), Henderson and Cockburn (1994), Powell (2001) and Teece et al. (1997).

EXAMINING THE RELATIONSHIP BETWEEN ORGANIZATION STRUCTURE AND INNOVATION

Based on the above, it can be inferred that: (1) if a firm possesses and exploits resources and capabilities that are both valuable and rare, it will attain competitive advantage; (2) if these resources and capabilities are also non-substitutable the firm will obtain competitive advantage; and (3) the attainment of such advantage will enable the firm improve its short-term and long-term performance (Newbert-2008, p 745).

Extant literature clearly suggests that organization structure contributes to a sustainable competitive advantage. With the skills specific to each individual and shared within the organization, the firm manifests its own capabilities which will be unique to the organization (Powell, 1992). Imitability results because of the inability of competitors to determine the true source of competitive advantage (Lippman & Rummelt, 1982). Finally, organization structure cannot be substituted. The specific organizational structure of a firm is more valuable to that firm than that of the competitors (Dierectix & Cool, 1989; Milter & Shamsie,1996).

If drilled deeper, for the purpose of the study, the six dimensions of organization structure - vertical and horizontal complexity (Hall et.al., 1967), formalization (Hall, 1962), centralization (Hickson, 1969), delegation of authority (Khandwalla, 1977) , and participation of decision making (Hrebiniak, 1974), are organizational resources theorized to be related to innovation which , in turn, is related to firm's market performance.

Research on Organization Structure and Innovation

There has been substantial research on the management of innovation (Khandwalla, 2003). However, there is yet only modest research on what sort of organization design yields a stream of successful technical and organizational innovation.

Organization Structure and Innovation – Some Indian Studies.

Yamini and Gupta (2008) explored the relationship between organization structure and perceived innovation in the manufacturing industry sector in India. Data collected from 250 employees of four firms brought out a significant relationship between the variable of organization structure considered in their study and perceived innovation. Khandawala in 1985 and in 1995, shed light on the organizational design needed for innovativeness. Khandawalla's (1985) study of policy frameworks used by a sample of 75 companies yielded one that he labeled as 'pioneering innovative'. This consisted of a group of policies that favored pioneering of novel, technologically sophisticated, high quality products in Indian market, emphasis of innovation as experimentation in all operations of the organization, entrepreneurial risk taking, operating flexibility and hiring of creative youngsters with considerable operating responsibility and autonomy. In 1995, Khandwalla identified 3 top management styles that had the largest correlations with the organization's rated innovativeness: (1) the entrepreneurial style of pursuing big but risky growth opportunities; (2) the organic style that emphasizes improvisation and operating flexibility; and (3) participative decision making. These three styles had the largest number of significant correlations with organizational mechanisms for generating innovative ideas. However, the style with the largest number of significant correlations with organizational aids for implementing innovations and changes, were the bureaucratic and altruistic styles of management that stressed accountability, the following of rules and regulations, and business ethics. Besides, the styles with the largest number of significant correlations with stabilizers of change were the altruistic, the bureaucratic and the participative styles (Khandawalla, 1995). Therefore, for an organization to be successfully innovative, it may not be enough to have only an entrepreneurial or organic style of management, it is also necessary for the management to emphasize

widespread participation in implementing innovative initiatives, accountability for performance, and also norms, values and ethics to generate trust and commitment of the management and its innovative initiatives.

Nina Jacob (1998) studied four pairs of Indian organizations and showed that organization design for innovativeness was a strategic choice of management. This was a comparative study of three creative organizations (those whose outputs are both novel and useful) and three organizations of the same type that were much less creative. Taking a leaf from Peter Drucker's study in 1985 on innovation and entrepreneurship, Manimala's study (1999) of 167 entrepreneurial case studies showed sharp differences between what he called 'PI' or pioneering- innovative entrepreneurs and ordinary entrepreneurs. Comparable findings were found from a study of Indian impact making entrepreneurs (Jain and Ansari, 1988). Service and Boockholdt (1998) surveyed the literature on organization innovations and identified structure of the organization and the control system as one of the eight broad factors that affect innovativeness.

All the above evidence seems to strongly suggest that that organization design facilitates innovation.

Organization structure dimensions and innovation

Vertical Complexity and Innovation

Vertical complexity is an organization form that has a structure with power emanating from the top downward. There's a well-defined chain of command with a vertical organization, and the person at the top of the organizational chart has the most power. Robbin (1999) considers high vertical complexity important for enhancing innovation. He established that flat structure reduces promote on and growth opportunities in an organization, which are motivating factors of tall hierarchies.

Vedamachicham (2001) found that vertical complexity is important for innovative organizations, since it acts as a sieve through which ideas are filtered. Leavitt (2003) found that despite their negative reputations many hierarchies have demonstrated impressive adaptability to change. He posits that hierarchies deliver real, practical and psychological value by fulfilling a deep human need for order and security. Therefore, they can facilitate innovations. Anderson, Dreu and Nijstad (2004) found the expectation of rewards in the form of opportunities for growth an important factor for employees to innovate. Smith and Ainsworth (2005) found that hierarchy presents opportunities for managers to meet power, authority and status needs. They assert that some amount of need to control is a pre-requisite for successful managing. We therefore propose:

H1: Vertical complexity has significant positive relationship with Innovation

Horizontal Complexity and Innovation

Horizontal complexity is a form of an organization that has a less-defined chain of command. Employees across lines have similar input into how the organization is run. Research shows evidence of a positive relationship between horizontal complexity and innovation. An awareness of problems and opportunities across areas can spark creative ideas. New ideas are more likely to emerge when a diversity of views are shared. Pavitt (1994) posits that horizontal diversification presents key opportunities for new product development, especially in R&D based organization. Jacob (1998) rated the Indian advertising company, Mudra, as high on innovativeness. She found that it was characterized by high horizontal complexity. Damanpour (1991) highlighted the positive relationship between horizontal complexity (specialization) and innovation. Sharma (2000) found that innovative chemical firms were characterized by horizontal complexity. Troy, Szymansky and Vardarajan (2001) posit that horizontal differentiation and development of new ideas in an organization are correlated.

Bommer and Jalajas (2004) found that greatest innovations happen, where different functional units interact to develop products and processes that best meet the needs of customers. Hence the proposition:

H2: Horizontal Complexity has a significant positive relationship with Innovation.

Formalization and Innovation

Formalization is a form of organization that focuses on roles and positions rather than the people in the positions. Formalization is the process of creating a formalized structure and includes the maintenance of that formal structure over time. Formalization of an organizational structure is commonly initiated in an attempt to rationalize the decision-making process. Shrivastava (1991) posits that formalization through various rules and procedures creates a feeling of security in the organization, protecting employees from arbitrary management decisions. Taking a positive view of formalization, he says that by establishing organizational standards it enhances role- clarity and reduces role conflict. Hence, it leads to employee commitment, involvement, and increase organization effectiveness. Besides formalization leads to administrative efficiency and, to that extent, it helps innovation. Bartol and Martin (1991) posit that rules and procedures help provide coordination and directedness. Fairlough (1994) states that formalization is a method of creating discipline in work-processes and employee behavior, which is very important for any collective creation process. Khandwalla (1995) found significant correlation between high formalization and implementation of innovations in bureaucratic organizations in India. Weick (1998) says that although autonomy, flexibility and discretion are required for effective implementation of these ideas, the use of firm control, formal documentation, formal review, disciplined problem solving and standardization; settle ambiguity and uncertainty and provide guidelines for practice. A greater

autonomy – flexibility approach at the implementation stage, might even be harmful for innovations according to Deachy – Zahany, Somech, Granot and Spitzer (2004). Wijnberg, Ende and Wit (2002) report that formalization increases the accountability of decision makers towards each other and towards the organization as a whole. Thus, we propose:

H3: Formalization has positive relationship with Innovation.

Centralization and Innovation

A decentralized structure is a form of an organization where decision-making is spread out to include more junior managers in the hierarchy, as well as individual business units or trading locations. Rothwell (1992) posits that greater empowerment and increased decision making at lower level of management, reduces the number of approvals required for decisions. Empowered project managers add to the speed and efficiency of new product development. Pavitt (1994) found that effective commercial exploitation of technology for innovation required decentralization for rapid decision making. Khandwalla (1995) posits that decentralization has positive motivational effect on employees. West (2000) provides support that high centralization is a negative predictor of innovation. Vedamanickam (2001) found that decentralization was positively correlated with workplace innovativeness. Shavina (200) suggests that empowered multi- functional teams are more successful at innovating. Kanter (2004) says innovative organizations are more decentralized. McNulty and Ferlie (2004) posit that innovations increasingly require decentralization today. The finding of Khandwalla and Mehta (2004) indicates that extensive decentralization helped innovations. To sum up, decentralization improves democratic decision making, fosters responsiveness among employees, and enhances the ability of lower levels to influence management (Samaratunga, 2003), all

of which facilitate innovation. Given the past research and literature evidence that showed a positive relationship between decentralization and innovation, we propose that:

H4: Centralization has a negative relationship with Innovation.

Delegation of Authority and Innovation

Delegation of authority is ‘the process of entrusting authority and responsibility to others throughout the various levels of the organization and the creation of a special manager – subordinate relationship’ (Kantar, 2004). This can only be achieved by empowering the workforce (Mullin, 2005). Relinquishing authority and giving employees considerable autonomy can boost innovation and success at knowledge firms even during crisis (Amar, Hentrich and Hlupic, 2009). Further, organizational behaviorists tend to view delegation as a matter of ‘empowerment’ (Thomas and Velthouse, 1990). Research widely indicates that empowerment of various organizational levels and multifunctional teams help innovations. Rothwell (1992) posits that greater empowerment and increased decision making at lower level of management reduces number of approvals required for decision. According to Lee and Hwa (1997), the power of an innovative organization is selectively separated into teams. These characteristics of the innovative organization were also found by Mintzberg (1979). He found that power was first released to the teams in an innovative organization, and thereafter separated between the members of the team. He says in such organizations various liaison mechanisms within and between teams, promote mutual adjustment and hence innovation. Shavinina (2003) also suggests that empowered multi-functional teams are more successful at innovating. The ability of the lower levels to influence management by enabling them share in decision making, enhances innovation (Samarantunge, 2003). Thus, we suggest:

H5: Delegation of Authority has a positive relationship with Innovation.

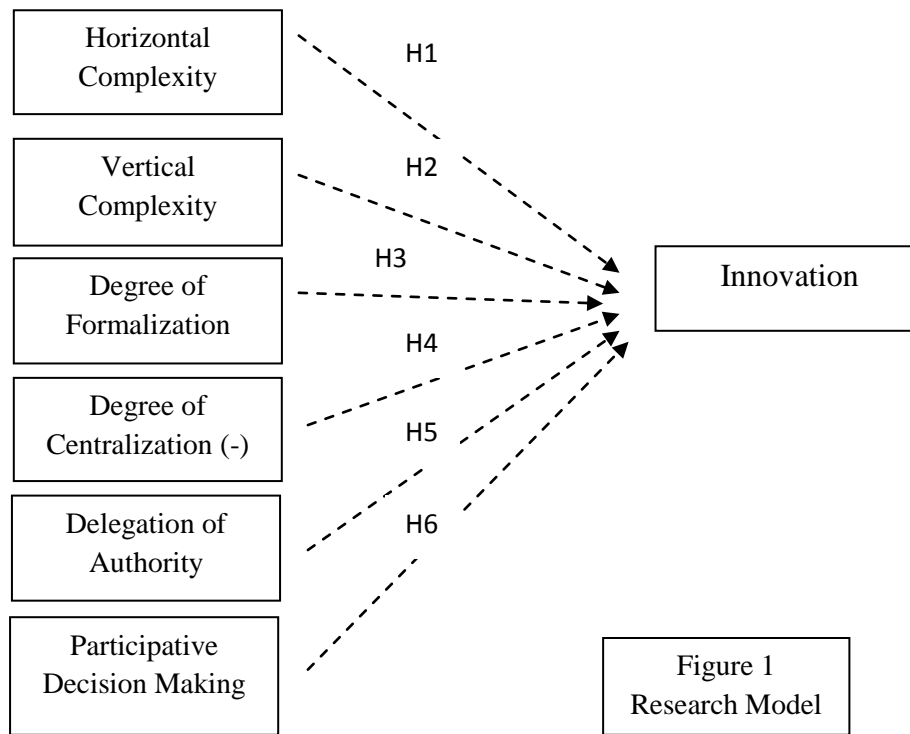
Participative Decision Making and Innovation

West (1990) identified Participative Safety - the sense that team members can participate in decision-making and can share ideas without fear - as important for innovation. Further, participation has been found to increase organizational commitment and promote better interpersonal relationships among employees (Srivatava, 1991). Lowe (1995) posits that participative structures are most appropriate for innovation. Khandwalla (1995) found positive correlations between participation in decision-making and organizational innovations in an Indian sample. Dumpy and Bryant (1996) found that in self-managed-teams, team members interact with each other rather than relying on higher authority for decisions. This increases the speed of innovation by speeding the decision making process. Strauss, Heller, Pusic and Wilpert (1998) say that participation fosters integration. Where there are high levels of participation in decision making, there is more information exchange and interaction within the groups. These groups are more likely to work through difficulties associated with introduction of innovations. They process information and opinions about innovations more comprehensively, ensuring more effective outcomes. These not only increase the chances of success of particular innovations, but also increase receptivity to future innovation. For Shadur, Kienzle and Rodwell (1999), high participation in decision making leads to greater commitment and organization involvement. Khandwalla and Mehta (2004) found that decisions in innovative organic structures emerged through participation of those involved in and affected by decision directly. Therefore:

H6: Participative Decision Making has positive relationship with Innovation.

Research Model

The preceding literature review provided the basis for us to arrive at a simple research model for this study, which is shown in the figure below:



Sample and Study Procedure

The sample for this study was drawn from organizations in the manufacturing and services sectors in India. Organizations having both single and multiple locations across the country were approached to participate in the study. The sectors chosen for the study are relevant in the current business and economic context. The manufacturing sector has witnessed 2.5% growth in the current quarter of Jan- March 2013 (CII Annual Report, 2012-13). It contributes to 15% of India’s GDP and accounts for 50% of India’s export production. With respect to the service sector, India’s services sector expanded quickly with double-digit growth in the second half of the 2000s. Although growth slowed down with the worsening of the Euro-zone crisis, the sector is still growing at a rate of 9.2% CAGR` and it contributes 58% of India’s GDP.

EXAMINING THE RELATIONSHIP BETWEEN ORGANIZATION STRUCTURE AND INNOVATION

A total of 8 Indian organizations across public and private sector firms consented to participate in the study. A few of the organizations requested that the researchers make a brief presentation about the objectives, scope and implications of the study. A questionnaire was sent by email to a total of 311 managers across all the organizations through their respective HR or Sales departments. Data were collected from managers because managers are seen to play a significant role by making important economic contributions to a organizations (Quick and Cooper, 2002). For the purpose of this study managers with team responsibilities (at least one subordinates) were selected. The human resources departments and sales department of the thirteen organizations assisted the researchers to identify prospective managers who fulfill the criteria. Stratified random sampling was used to select managers across tenures, education, hierarchical levels and functions.

Groups were categorized according to convenience of the employees to optimize organizational time and facilitate data collection. A questionnaire was prepared in English since it is spoken and understood by the majority of the managerial population in India. A physical version of the survey was administered to the employees directly by the researchers or through the sales and HR anchors. Along with the questionnaire was a brief note explaining the objectives of the survey. Respondents were assured of the confidentiality of their responses. Of the 210 who returned the questionnaire, 198 (94%) were usable. The average tenure at their current jobs was six years (S.D.= 6.42); 21 per cent were graduates (bachelors degree), 55 per cent were post graduates (with a Master's degree), 21 per cent were professionals (chartered accountants) and 2 per cent doctoral degree (PhDs). The respondents represented diverse functional backgrounds covering accounting/finance (19 per cent), human resources (9 per cent), sales and marketing (51 per cent), engineering (10 per cent), and research and development (2 per cent). In terms of management

hierarchy, 30 per cent belonged to junior management cadre, 63 per cent belonged to middle – management cadre and 7 per cent belonged to senior management cadre.

Measures:

All the measures used a response scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Perceived innovation was measured by a nine-item scale constructed by the researchers and validated for the purpose of this study. The items were influenced by Jong and Hartog's (2010) concept of Innovative Work Behavior (IWB). IWB reflects four factors, namely: idea-generation, idea-exploration, idea-championing and idea-implementation. The four dimensions were aggregated to create an overall scale on perceived innovation. High scores on all three dimensions indicate high perception on innovation. The Cronbach's alpha coefficient score for the scale was 0.734.

Vertical complexity was measured by a five- item version scale constructed by the researchers and validated for the purpose of this study. A sample item includes: 'Before a decision is taken one has to go through multiple levels'. The Cronbach's alpha coefficient score for the scale was 0.770.

Horizontal complexity was rated using a five- item measure constructed by the researchers and validated for the purpose of this study. A sample item includes: 'We work in cross functional taskforces or teams for critical projects'. The Cronbach's alpha coefficient score for the scale was 0.621

Degree of formalization was measured by a five- item scale constructed by Hage and Aiken's (1977) 'Formalization Inventory' (Yamini and Gupta, 2008). The inventory covered two critical aspects of formalization namely job-codification and job-specificity. The Cronbach's alpha coefficient score for the scale was 0.740.

EXAMINING THE RELATIONSHIP BETWEEN ORGANIZATION STRUCTURE AND INNOVATION

Degree of centralization was measured with a four- item version constructed by Hage and Aiken's (1977) 'Hierarchy of Authority'. A sample item includes 'Even small matter has to be referred higher for final answer.' The Cronbach's alpha coefficient score for the scale was 0.700.

Delegation of authority was measured with a five - item version constructed by Daftuar (1988) 'Delegation of Authority Scale'. The Cronbach's alpha coefficient score for the scale was 0.770.

Participative decision making was measured with a four - item version constructed by Hage and Aiken's (1977) 'Scale of Personal Participation in Decision Making' Yamini and Gupta (2008).. The Cronbach's alpha coefficient score for the scale was 0.738.

Research suggests that experience in the current organization, total respondent work experience, the level of management one comes from, the existing management levels in the firm (levels of hierarchy) and turnover, relate to perceived innovation of an organization (Rothwell, 1992).

Analysis:

Table 1 below, shows descriptive statistics and correlations for each variable. The constructs used in the study were reliable, with coefficients ranging from 0.62 to 0.77, around the minimum of 0.70 (Nunnally, 1978). No significant relationship was observed between demographic variables (experience in the current organization, total working experience, organization level and turnover) and the primary variables in this study. However the analysis reveals high association between some of the factor scores. By examining the coefficients, it was found that the following variables had a significant positive relationship with perceived innovation: vertical complexity ($r=0.33$, $p<.001$), horizontal complexity ($r=0.52$, $p<.001$), degree of formalization ($r=0.43$, $p<.001$), participative decision making ($r=0.27$, $p<.001$), and delegation of authority ($r=0.35$, $p<.001$). Centralization was

the only variable to be found having a negative relationship with perceived innovation ($r = -0.35$, $p < .001$);

We assessed the relationship between perceived innovation and the structural variables using regression analysis. As illustrated below, we found out that 44% of the variation in innovation is explained by other factors, herein mentioned as the dimensions of organization structure.

Model Summary

Model	R	R Square
1	0.666 ^a	0.444

a. Predictors: (Constant), Delegation of authority, Vertical Complexity, Horizontal Complexity, Decentralization, Participative Decision Making , Formalization

ANOVA yielded a significance level of $p < .001$. Examining the level of coefficients it was found that, Vertical Complexity has positive relationship with Perceived Innovation ($\beta = .29$, $p < .001$). Hence H1 is supported. Examining the level of coefficients it was found that, Horizontal Complexity has positive relationship with Perceived Innovation ($\beta = .45$, $p < .001$). Hence H2 is supported. Similarly, Formalization has positive relationship with Perceived Innovation ($\beta = .39$, $p < .001$). Hence H3 is supported. Examining the level of coefficients it was found that Centralization has a negative relationship with perceived Innovation ($\beta = -.31$, $p < .001$). Hence H4 is supported. Examining the level of coefficients it was found that, Delegation of authority has positive relationship with perceived Innovation ($\beta = .36$, $p < .001$). Hence H5 is supported. Examining the level of coefficients it was found that, participative decision making has positive relationship with perceived Innovation ($\beta = .24$, $p < .001$). Hence H6 is supported. The same is provided as Table 1.

Discussion and Implications:

There is very little large sample research of innovation in emerging markets. Even in Western research, the evidence, so far, is still quite modest (Khandwalla, 2001). Thus, this study fills an important gap area. Furthermore, the study is based on the subjective perception of 198 top, middle and junior level managers of a proportion of 8:40:52 respectively from Indian organizations, which in future can make credible contribution in the Indian corporate landscape. This study also gets indirect support from the literature review done on perceived innovation and organization structure from 1934 to early 2000.

The study presents fairly strong evidence that redesigning organization structures for innovation, both in manufacturing and service sectors, can provide a powerful innovation edge to organizations, regardless of pressures from external factors (Khandwalla, 2001). Contrary to the popular view in management and organization literature, the study also suggests that the negative view of formalization and the eulogization of informal structure and culture a-la-Peters and Waterman (1982), may, as far as innovation is concerned, be more hype than reality. This study takes a positive view on formalization, contrary to the popular evidence supported by large number of research (Pugh, Hickson, Hinnings & Turner, 1968). However, further research needs to elaborate on this relationship. This study also takes a positive view of vertical complexity which, again, is contrary to popular image of vertically complex organizations being “bureaucratic” and thereby inimical to innovation (Hartley, 2004). The study also makes a significant contribution by proving the negative relationship between perceived innovation and centralization, though further research is needed to elaborate on this relationship, in the light of differing views of ‘bottom up innovation’ as per the ‘dual core model’ propounded by Daft (1978).

Implications for management:

The preceding discussion suggests that for organizations to foster and promote innovation, other things being equal, they need to have a moderate amount of vertical complexity, that is, have an adequate number of hierarchical levels as a structural mechanism for ensuring the order and the sense of security necessary for people to free energies for innovative work, provide a filtering process for screening worthwhile innovation, and satisfying human needs for growth (perceived, even if not actual). Organizations would need designs that allow a sufficient number of different units or divisions to encourage diversity, and specialized attention to products and processes, and the associated processes of learning, problem-solving and creative thinking. They also need to formalize systems and processes that are repetitive in nature so that, time and energy may be freed for creative and innovative work. Managers should drive business relevant innovation from the lens of the decision makers thereby reducing the cycle time for implementation and for obtaining top management support. They need to create or develop organizational cultures and practices that allow and encourage decentralized working even while the organization retains a certain amount of vertical complexity in the form of different hierarchical levels. Finally, they need to promote and encourage participative decision-making through appropriate structures and systems such as self-managed work teams or parallel structures.

Theoretical Contributions:

This study makes important theoretical contributions to three bodies of knowledge. First, in the domain of perceived innovation, the study joins a small but growing body of research that addresses organization factors that influence innovation and its outcomes. Second, these factors are specifically attributed to managers from Indian manufacturing and service sector organizations and

therefore unique in that respect. Third, this research extends its contribution by studying the intra-organizational structure dimension of a firm with respect to innovation.

Limitations and future research

Despite some possibly significant theoretical contribution, the study has its limitations. The design of the study does not allow us to conclusively determine causality between the structural variables and innovation; more elaborate research designs would be necessary for that. Future research would need to replicate the findings of this study on outcomes measured through methods other than self-reporting. Since the sample of organizations studied was limited to manufacturing and service organizations in India, we cannot be sure of the generalization of results to other firms in other sectors or countries. However, the seven organizations in our sample cut across two large sectors and differed in terms of size, structure and business goals, therefore, possibly diluting concerns over generalizability. Future studies would be necessary to evaluate the model in the case of different types of firm and in different geographical contexts. Cultural and technological difference could be significant moderators in the relationship between the structural variables we studied, and organizational innovation.

Conclusion

Designing innovative organizations is difficult, especially in emerging economies in which traditionally there was a heavy reliance and concentration on centralized control and command systems. If one goes back to look into the predominant management styles prevalent in the emerging economies, one would find authoritarian and paternalistic styles predominant (Oh, 1991; Vimani and Guptan; 1991). This paper may be of particular use to organizations in emerging economies, as it suggests the kind of structural forms which may be conducive to encouraging innovation. This comes

EXAMINING THE RELATIONSHIP BETWEEN ORGANIZATION STRUCTURE AND INNOVATION

at a time when firms in emerging Third World economies are on the brink of pursuing different innovative strategies and practices to achieve different objectives. New products will have to be developed to enhance 'differentiation'. They also need to reach out to newer markets, urban, semi urban and rural. Innovative strategies need to be devised to offset competition in existing markets. Improving production or operation related routines through innovation may provide them with cost advantages over competition. To be able to achieve all this, organizations should arrange or design themselves keeping in mind the basic components and characteristics of innovation.

EXAMINING THE RELATIONSHIP BETWEEN ORGANIZATION STRUCTURE AND INNOVATION

Model	Unstandardized Coefficients		Sig.
	B	Std. Error	
Vertical Complexity	.29	.061	<.001
Centralisation	-.31	.059	<.001
Horizontal Complexity	.45	.061	<.001
Formalization	.39	.062	<.001
Participative Decision Making	.24	.059	<.001
Delegation of authority	.36	.061	<.001

Table 1: Regression Table

EXAMINING THE RELATIONSHIP BETWEEN ORGANIZATION STRUCTURE AND INNOVATION

Correlations											
	Experience	Total Workex	Org. Level	Turnover	Perceived Innovation	Vertical Complexity	Centralisation	Horizontal Complexity	Formalization	Participative Decision Making	Delegation of authority
Experience	1										
Total Workex	0.75**	1									
Org. Level	0.03	0.01	1								
Turnover	0.20**	0.17*	0.04	1							
Perceived Innovation	-0.03	-0.03	-0.01	0.03	1						
Vertical Complexity	0.09	0.08	-0.06	0.02	.32**	1					
Centralisation	0.06	0.00	-0.13	-0.06	-0.34**	.16*	1				
Horizontal Complexity	-0.01	0.02	0.02	0.06	.52**	.28**	-.14*	1			
Formalization	0.09	0.08	-0.06	-0.01	.43**	.357**	-.14*	.38**	1		
Participative Decision Making	-0.07	0.00	0.00	0.09	.26**	0.050	-.25**	.20**	0.05	1	
Delegation of authority	0.04	0.08	-0.10	0.05	.34**	.19**	-.28**	.21**	.21**	.39**	1

** . Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 2: Correlation Table

EXAMINING THE RELATIONSHIP BETWEEN ORGANIZATION STRUCTURE AND INNOVATION

References

- Ahuja, Lampert and Tandon (2008). Moving Beyond Schumpeter. *Academy of Management Annals*, 2, 1–98.
- Amabile, T.M. (1983). The social psychology of creativity. *Springer – Verlag*, New York.
- Anderson, N. CKWD Dreu & B.A. Nistad (2004). The Routinization of Innovation Research: A constructive critical Review of the State of the Science, *Journal of Organization Behavior*, 25, 147-173.
- Anderson, N., King, N. (1993). Innovation in Organizations. In C.L.Cooper, & L.T. Robertson (Eds), *International Review of Industrial and Organization Psychology*, 8, 1-34.
- Baldwin, J.R., Chandler, W., Le, C. & Papailiadis, T. (1994). *Strategies for Success: A Profile of Growing Small and Medium– sized Enterprises in Canada* (No. 523), Ottawa, Canada.
- Burack, E.H., & Nugandhi, A.R. (2002) Organization Design: Theoretical perspectives and empirical findings. Kent, Ohio: Comparative Administration Research Institute, Kent State University.
- Bartol, K.M. & D.C. Martin, (1991). *Management*, New York: Mc. Graw Hill Publishing.
- Barney, J.B. (1991). Firms resources and sustained competitive advantage'. *Journal of Management*, 17, 99-120.
- Bart Chris (2004). Innovation, mission statements and learning. *International Journal of Technology Management*, 27, 22-24.

EXAMINING THE RELATIONSHIP BETWEEN ORGANIZATION STRUCTURE AND INNOVATION

- Bommer, M. & D.S. Jalajas. (2004). Innovation Sources of Large and Small Technology based Firms. *IEEE Transactions on Engineering Management Review*, 51, 13-18.
- Booz&Co. (2010). *FMCG Roadmap to 2020*.
- Chandler, A. (1962). *Strategy and Structure*, MA: *MIT Press Cambridge*.
- Cummings. L.L. & Berger. C.J. (1976). Organization Structure: How does it influence attitudes and performance? *Organization Dynamics*, Autumn, 24-49.
- D'Souza & Bhowmick. (2012). Relationship between Organization Structure and Innovation., *NHRD Network Journal*, 5, 25-30.
- Daft, R.L. (1978). A dual core model of innovation. *Academy Of Management Journal*, 21, 193- 210.
- Dalton, D.R., Tudor, W.D. Spendolini, M.J., Feilding, G.J. &Porter, L.W. (1980) Organization structure and performance: a critical review. *Academy of Management Review*, 5, 49-64.
- Damanpour, F (1991). Organization Innovation: A Meta Analysis of Effects of Determinants and Moderators. *Academy of Management Journal*, 34, 555-590.
- Deshpande, R., Farley, J. & Webster, F. (1993). Corporate culture, customer orientation, and innovativeness in Japanese forms: a quardard analysis. *Journal of Marketing (Chicago)*, 57, 23-38.
- Drucker Peter (1985). *Innovation and Entrepreneurship*. Heinemann, London.
- Ford, J.D., & Slocum, J.W. (1974). Correlates of performance in community colleges. *Journal of Higher Education*, 45, 672-681.

EXAMINING THE RELATIONSHIP BETWEEN ORGANIZATION STRUCTURE AND INNOVATION

- Gralbraith, J.R. (1977). *Organization design*, Reading, Mass.: Addition – Wesley.
- Grant, R.M. (1991). The resource based theory of competitive advantage: implications for strategy formulation. *California Management Review*, 2, 561-75.
- Hage, J.T. (1999). Organizational Innovation and Organization Change. *Annual Review of Sociology*, 25,597– 622.
- Hall, R.H. (1977). *Organization: Structure and Process*, Englewood Cliffs N.J.: Prentice Hall.
- Howard, A. (Ed). (1995). *The changing nature of work*. Jossey – Bass, San Francisco.
- Hult, G.T.M., Snow, C.C. & Kandemir, D. (2003). The role of entrepreneurship in building cultural competitiveness in different organization types. *Journal of Management*, 29, 401-26.
- Hurley, R.F. (1995). Group culture and its effect on innovative productivity. *Journal of Engineering Technology Management*, 12, 57-75.
- Jacob Nina (1988). *Creativity in organizations*, AH Wheeler, New Delhi.
- Jain,Gautam & Ansari M. (1988). Self-made impact making entrepreneurs, *Entrepreneurship Development Institute, Ahmadabad*.
- James, J.L.& Jones, A.P. (1976). Organizational structure: A review of structural dimensions and their conceptual relationships with individual attitudes and behavior. *Organization Behavior and Human Performance*. 16, 74-116.
- Jay R Galbraith (1985). *Organization Design*.
- Kay, J. (1993). Foundations of corporate success: How business strategies add value. *Oxford: Oxford University Press*

EXAMINING THE RELATIONSHIP BETWEEN ORGANIZATION STRUCTURE AND INNOVATION

Khandwalla, P.N. (1977). *The design of organizations*. Harcourt, Brace, Jovanovich, New York.

Khandwalla, Pradip. N. (1995). *Management styles*. New Delhi: Tata McGraw-Hill.

King, N., & Anderson, N. (2002). *Managing innovation and change: A critical guide for organizations*. Thompson, London.

Kilman, R.H., Pondy, L.L. & Slevin, D.P. (1976). *The management of organization design* (Vols. 1&2). North- Holland, New York.

Leavitt HJ (2003). Why Hierarchies Thrive. *Harvard Business Review*, 82 (7/8), 150-161.

MacKensie, K.D. (1978). *Organization structure*. Arlington Heights, III: AHM Publishing .

Manimala, Mathew (1999). *Entrepreneurial policies and strategies – the innovator's choice*. New Delhi: Sage Publication.

Melcher, A.J. (1976). *Structure and process of organizations*. Englewood Cliffs. N.J.: Prentice Hall.

Nandan Nilekani (2010). *Imagining India*. Penguin Publishing.

Nunnally, J.C. (1978). *Psychometric Theory*, 2nd ed., New York: McGraw-Hill.

Ouchi, W.G., & Harris, R.T.(1974). Structure, technology and environment. In G. S. Strauss, R. R.E. Miles, C.C. Snow, & A.S. Tannenbaum (Eds), *Organization behavior: Research and issues*. Industrial Relations Research Association, (pp 107-140). Madison, Wisconsin.

Pavitt, K. (1994). Key Characteristics of Large Innovating Firms in M Dodgson and R Rothwell (eds). *Handbook of Industrial Innovation*, Edward Elgar.

EXAMINING THE RELATIONSHIP BETWEEN ORGANIZATION STRUCTURE AND INNOVATION

Penrose, E.T. (1959). *The Growth of the Firm*. Wiley: New York.

Peters, T & Waterman, R.H. (1982). *In search of excellence: Lessons from America's best-run companies*. New York: Harper and Row Publishing.

Pfeffer, J. (1978). *Organizational design*. Arlingotn Heights III. AHM Publishing .

Pertussa – Ortega, E.M., Molina – Azorin, J.F. and Claver – Cortes, E (2010). Competitive strategy, structure and firm performance: a comparision of the resource – based view and the contingency approach. *Management Decision*, 48 (8), 1282-1303.

Quick, J.D. & Cooper, C.L. (2002). Executive health: building self-reliance for challenging times in Cooper, C.L. and Robinson, I.T. (eds), *International Review of Industrial and Organizational Psychology*, Wiley, Chichester, pp. 187-216.

Rosabeth Moss Kanter. (1982).The Middle Manager as Innovator. *Harvard Business Review*.

Rummelt, R.P. (1974). *Strategy, Structure and Economic Performance*. Harvard University Press, Boston M.A.

Robbins, S.P, (1999). *Organization Theory: Structure, Design and Applications*. Prentice Hall of India, New Delhi.

Scott, W.R.(1975) “Organizational structure”. In A. Inkeles, J. Coleman, & N. Smelser (Eds.), *Annual Review of Sociology*. Palo Alto, Calif.” Annual Reviews, 1-20.

Service, Robert, W. and Boockholdt, James, L. (1998). Factors Leading to Innovation: A Study of Managers' Perspectives. *Creativity Research Journal*, 11(4), 245-307.

EXAMINING THE RELATIONSHIP BETWEEN ORGANIZATION STRUCTURE AND INNOVATION

Sharma, M.M. (2000). Innovation in the Chemical Industry. In S Purakayastha (Ed), *Global Innovation Strategies*. New Delhi: *Tata McGraw – Hill Publishing*.

Smith, N.& M.Ainsworth. (2005). *A Guide to Organization Creativity: Managing for Innovation*. Mumbai: *Jaico Publishing*.

Snow, C.C. & Hrebiniak, L.G. (1980). Strategy, distinctive competence, and organizational performance. *Administrative Science Quarterly*, 25, 317-36.

Sounder, W.E. and Serman, J. (1994). *Managing New Technology Development*, New York: *McGraw –Hill*, Srivastava, D.K. (1991). Organization Effectiveness: Role of Organizational Structure and Process and Personality. Phd Thesis, *Dept of Humanities and Social Sciences*, Mumbai, Indian Institute of Technology, Bombay.

Stalk,G.& Hout, T. (1990). Competing Against Time: How Time-based Competition is Reshaping Global Markets. New York: *Free Press Publishing*.

Sujuki, Y. (1980).The strategy and structure of top 100 Japanese industrial enterprises 1950 – 1970. *Strategic Management Journal*,1, 265-91.

Tajeddini, K., Trueman, M. (2008).The potential for innovativeness: a tale of the Swiss watch industry. *Journal of Marketing Management*, Vol 24 Nos1&2, pp.169-84.

Troy, L.C., D.M. Szymanski & P.R. Varadarajan. (2001). Generating New Product Ideas: An Initial Investigation of the Role of Market Information and Organization Characteristics. *Journal of Academy of Marketing Science*, 29, 89-101.

EXAMINING THE RELATIONSHIP BETWEEN ORGANIZATION STRUCTURE AND INNOVATION

Van de Ven, A.H. (1976). A framework for organizational size. *Academy of Management Review*, 1, 64-78.

Van de Ven, A., Angle, H.L. & Pools, M. (Eds). (1989). Research on the management of innovation: The Minnesota studies”, New York: *Harper & Row*.

Vedamanicham, J., (2001). Study of Innovativeness in Manufacturing. *Sailesh J Mehta School of Management*, Mumbai.

West, M.A. (2002). Sparkling Fountains or stagnant ponds: an integrative model of creativity and innovation implementation within groups. *Applied Psychology: An International Review*, 51, 355-386.

West, M.A. and Farr, J.L. (1990). Innovation at work. In M.A. West, & J.L. Farr (Eds.), *Innovation and creativity and work: Psychological and organizational strategies*. Chichester: Wiley.

Yamini and Meenakshi. (2008). Exploring the relationship between organization structure and perceived innovation in the manufacturing sector. *Singapore Management Journal*, (pp.11-13).