Organization Design & Perceptions of Innovation: Implications for the Indian Pharmaceutical Sector

Yamini Prakash Sahay & Meenakshi Gupta

This study probes in to the relationship between organization structure and perceptions of innovation in the pharmaceutical sector of India. Structure includes formalization, centralization, concentration of authority and participation in decision making. Innovation is measured by perceived innovation, that is, the perception of innovation in the organization. Data was collected using questionnaires and interviews. Results were analyzed using both quantitative (statistical) and qualitative (content analysis) techniques. Positive relationship was found between participation in decision making and perceived innovation. Negative relationship was found between centralization and perceived innovation, and between concentration of authority and perceived innovation. No significant relationship was found between formalization and perceived innovation.

Yamini Prakash Sahay is Assistant Professor (OB/HRM),Indian Institute of Management (IIM) Rohtak 124001.E-mail: yaminip.sahay@iimrohtak.ac.in. **Meenakshi Gupta** is Professor, Dept. of Humanities and Social Sciences (H&SS), Indian Institute of Technology (IIT) Bombay, Mumbai.

Introduction

The word organization comes from Greek *organon*, which denotes 'coherent system or unit where independent parts work as one' (Arora, Belenzon & Rios, 2014). Structure not only shapes innovation but plays an active role in successful implementation. Therefore the distinguishing organizational characteristics of innovative firms are of interest to researchers (Souitaris, 2002; Subramanian & Nilakanta, 1996). The design and practice of organization can be optimized to provide a base for constant innovation (Moore, 2004). In order to remain competitive in the global business world, organizations may need to change their systems that are run like machines and where the top leaders decide everything important (Duin & Baer, 2010). Arora, Belenzon & Rios (2014) propose that firms pursuing innovations need a well-matched supporting structure for the purpose of innovations.

Broadly innovation not only includes development of new products and services, but also new operating practices, processes, managerial tac-

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tics and even business strategies. It may not always be a process of creating, rather a process of building, improving and adapting (Youtie, 2003). Subramanian and Nilakanta (1996) in their research found relationship between organizational characteristics and firm innovativeness. According to them innovativeness is a multidimensional construct. Organizational characteristics they studied were centralization, formalization and specialization. Truly innovative organizations, according to Subramanian (1996), are those that exhibit innovative behavior consistently over time. He proposes that an organization's strategic orientation reflects long-term or temporally enduring behaviors, innovativeness is also an enduring organizational trait.

An organization's structure can probably best be studied by using perceptual measures. Researchers like Reddy (cited in Pestonjee, 1997), Singh and Pestonjee (1988), among many others, have studied and measured organization structure as a perceptual/behavioral variable. The current study is an exploratory research, partly behavioral in nature. A fairly new variable, perceived innovation, has been introduced in this study. The objective is to study the relationship between components of organization structure and perceived innovation in the pharmaceutical industry of India.

Literature Review

Studies by Lewis, Welsh, Dehler and Green (2002) suggests that formalization discourages idea generation due to inflexibility that constrains creativity. Schultz and Schilling (1998), analyzed the impact of 'rule density' and found that the more solutions to problems are codified into rules, lower is the probability of discovering solutions that have not been explained by existing rules. Accumulation of too many rules in the organization can give rise to inflexibility and decreased opportunities for innovation, because rule-based activities consume more time and energy of employees. Shadur, Kienzle and Rodwell (1999) found that in bureaucratic organizations, formalized employee participation led to tension as employees seek greater flexibility for informal problem-solving. Formalized participation with its set of rules may hinder free flow of ideas for innovations. West (2000) emphasized that increased formalization and control constrains innovation. Khandwalla and Mehta (2004) found that improvisation was encouraged in innovative organizations and getting results was stressed over following rules and procedures. For Subramanian and Nilakanta (1996) too low formalization facilitates innovations.

Proposition 1: Formalization has negative relationship with perceived innovation.

Decentralization or low centralization according to Subramanian and Nilakanta (1996) facilitates innovativeness by encouraging new ideas as it promotes flexibility and openness in the organization.

Innovations increasingly require decentralization today.

West (2000) found high centralization to be a negative predictor of innovations. In his study Vedamanickam (2001) found that decentralization was positively correlated with workplace innovativeness. Shavinina (2003) suggested that empowered multi-functional teams are more successful innovators. Kanter (2004) also found innovative organizations to be decentralized. McNulty and Ferlie (2004) posited that innovations increasingly require decentralization today. Findings of Khandwalla and Mehta (2004) indicate that extensive decentralization helped innovations. Hence, for Samaratunge (2003), decentralization facilitates innovation by improving democratic decision making, fostering responsiveness among employees, and enhancing the ability of junior management to influence senior management through empowered decision making. As for Stevenson (2012), centralized leadership promotes a mechanistic system, which is exhausted and no longer meets the needs of the growing complex systems today; as it assumes that only one or a few persons in an organization know everything, hence, can make the right decision. Schraagen, Veld and De Koning (2010) maintained that in response to the dynamic environment, decentralized, team-based organizations are increasingly being adopted which have distributed power structures. In one research on an Indian sample Singh, Kodvani and Agrawal (2012) found that empowerment has a motivational effect on employees and significantly improves their performance and effectiveness. On the basis of above researches the following propositions were generated:

Proposition 2: Centralization has negative relationship with perceived innovation.

Proposition3: Concentration of authority has negative relationship with perceived innovation.

Participative in Decision Making

West (1990) defines "Participative Safety" as a sense in team members that they can participate in the decision making process and share ideas without fear. He considers it important for innovation because participation in decision making engenders participative safety in employees. Khandwalla (1995) found positive correlations between participation in decision making and innovation in an Indian sample. According to Strauss, Heller, Pusic and Wilpert (1998) participation fostered integration as they found that where there was high level of participation in decision-making there was greater information sharing and interaction within groups. These groups were more likely to work through difficulties associated with introduction of innovations and benefit from participation. Participative decision making for innovations is more effective in comprehensively solving an informational conflict. This increases not only the chances of success of innovations, but also the receptivity to future innovation. Khandwalla and Mehta (2004) found that decisions in innovative-organic structures emerged through participation of those employees who were

involved in and affected directly by a decision. Nayar (2010) discussing the participative environment of HCL Technologies, an Indian organization, says that employees are well connected providing each other with an environment that offers many alternative sources of information and resources that would otherwise not be available in non-participative environments. It helps create a social network within the company, which has an informal structure. Kilduff and Brass (2010) propose that chances for innovation, collaboration, execution and learning complex information are increased in cohesive and participative networks within the company. Best (2012) stating the example of PricewaterhouseCoopers in America says that the chairman when setting up an innovation office got every single person to participate and communicate in the processes. On the basis of above literature the following proposition was generated.

Proposition 4: Participation in Decision Making has positive relationship with Perceived Innovation.

Perceived Innovation

In a study of 339 organizations, Bart (2004) measured firm-level innovation by asking respondents to indicate:

- How innovative they perceived their organization to be (using a 10-point scale).
- How important innovation was to their organization (using a 10-point scale).

Perceived innovation conceptualized by the current study is similar to Bart's (2004) measure of firm-level innovation. The variable measures employee perceptions of how innovative they consider their organization is, the extent to which activities and processes in their organization are positive for and facilitative of innovations, and the organization's approach towards innovations. Literature in documented form on perceived innovation is rare. Hence, it maybe considered as a new variable. It is one of the measures among many others like number of innovations, percentage of sales of innovative products, expenditure on innovation and number of patents. In the current study perceived innovation has been conceptualized as the measure of innovation.

Organization Structure

It refers to the manner in which work and employees are organized in a firm; with the help of formal rules and procedures; by dividing them according to their functional expertise; by prescribing roles for employees; and by investing the power to take decisions at desired organizational levels in the desired personnel. Organization Structure is the independent variable in the study comprising four components:

1. *Formalization:* Formalization is defined in the study as the extent to which employee behavior and job/ role- specifications are regulated and standardized by the use of formal rules, procedures, and task definitions in the organization. Formalization has been measured by Hage and Aiken's

(cited in Miller, 1977) "Formalization Inventory".

2. *Centralization:* It refers to the degree to which authority for decision-making in an organization is concentrated at a single point or organizational/ managerial level. In the present study centralization is conceptualized as comprising two sub-components. These sub-components have also been analyzed as separate variables. Hence, centralization is measured by combining two scales (one for each sub-component) into a single scale. These sub-components are :

3. *Concentration of Authority:* It is the extent to which the decision-making power is concentrated at higher levels of the organizational/ management hierarchy. Concentration of authority is measured by the "Delegation of Authority" scale, devised by Daftaur (1988).

4. *Participation in Decision Making:* It refers to the degree of participation of members from different hierarchical levels and functional units in an organization, in the decision-making process. The variable is measured by Hage and Aiken's (cited in Miller, 1977) "Scale of Personal Participation in Decision Making".

Perceived innovation portrays employee perception of how innovative they consider their organization currently is and in the past. The measure includes employee perceptions of their organization's overall approach to innovation. This includes the extent of encouragement provided to innovations in terms of resources and time devoted and other initiatives taken by the organization to promote innovations. It also includes special initiatives taken by the corporate group to foster innovations, also flexibility and change in design aspects that may help innovations. Perceived innovation has been measured using a scale designed by the researcher.

Test Instruments

Data was collected using standard Likert type questionnaires for survey method.

1. *Formalization Inventory:* Formalization was measured by Hage and Aiken's Formalization inventory (cited in Miller, 1977: 284-86). This scale consisted of 15 items to be rated on a 4-point rating scale, from 1-definitely true to 4-definitely false. The criterion validity of the scale has been given, the criterion measure used was 'alienation'. Formalization is positively related to 'alienation'. Greater the degree of formalization in the organization, the greater is the likelihood of alienation from work. Dissatisfaction with work is high in organizations where jobs are rigidly structured. Strict enforcement of rules was strongly related to work dissatisfaction. Social relations are also disturbed when rules are strictly enforced. Sig-

Strict enforcement of rules was strongly related to work dissatisfaction.

nificant positive relationships were found between routine work and rule manual, job description and specificity of job descriptions.

2. *Centralization Scales:* The centralization scale is formed by combining two scales, one for 'concentration of authority', and the other for 'participation-in-decision-making'. The entire instrument had 8 items, 4 items from each of the two scales, both rated on a 5-point rating scale. The values on the scale varied in intensity from 1-never to 5-always.

3. *Delegation of Authority Scale:* Designed by Daftaur, (cited in Pestonjee,1988: 233-34), this scale measures concentration of authority. It is a 5-point rating scale from 1-never to 5-always. Lower the concentration of authority score of an individual higher is the centralization score and vice versa. Cronbach's alpha coefficient of reliability is .95

4. *Scale for Personal Participation in Decision Making:* Hage and Aiken's scale (cited in Miller, 1977: 287- 89) was used to measure participation in decision making. It is a 5-point rating scale, from 1-never to 5-always.

The Criterion validity measure used was 'autonomy'. Organizations in which decisions were made by only a few people at the top, relied on rules and close supervision as a means of ensuring consistent performance by the workers. The presence of a well trained staff is related to a reduced need for extensive rules. Organizations that are highly autonomous tend to have a non-participative internal decision structure. Greater the autonomy, larger is the executive's span of control.

Organizations that are highly autonomous tend to have a non-participative internal decision structure.

5. *Scale for Perceived Innovation:* It assessed how innovative employees perceive their organization to be. It also assessed employee attitudes of the organization's overall approach towards innovations. It consisted of 20 items, to be rated on Likert-type 5–point rating scale from 'strongly disagree-1' to 'strongly agree-5'. Test-retest reliability was .86. Internal consistency validity calculated by the inter-item consistency method is .90.

In-depth interviews were used to supplement the questionnaires in data collection. Interview data was analyzed qualitatively using content analysis. Questions in the interview schedule were semi-structured and open ended, focusing on all different relationships studied in the current research.

The Sample & Data Collection

A stratified random sample of 130 employees from the pharmaceutical firms of India participated in the study. All employees were subject to questionnaires, while 78 employees were subject to in-depth interviews. Participants for the study belonged to four different management levels, 10 from senior manage-

ment, 26 from middle management, 82 from junior management and 12 from supervisory staff.

Data was collected by personally approaching each participant for questionnaire completion. Face to face and in-depth interviews of many of these participants were also conducted. Data was collected from pharmaceutical firms located in a metropolitan city of India.

Correlation Results

Correlations computed show that there was a negative and significant relationship between centralization and perceived innovation ($r = -.28$, $p<.01$). There was a negative and significant relationship between concentration of authority and perceived innovation ($r = -.30$, $p<.01$). Participation in decision- making shows positive and significant relationship with perceived innovation ($r=.20$, $p<.05$). No significant relationship was obtained between formalization and perceived innovation.

Participation in decision- making shows positive and significant relationship with perceived innovation.

One Way ANOVA

ANOVA values show a significant relationship between centralization and perceived innovation ($F=4.09$, $p<.05$). In other words, there is a significant difference in the perceived innovation scores across the different levels of centralization. Significant relationship was also found between concentration of authority and perceived innovation ($F=14.25$, $p<.01$). Significant relationship was also found between participation in decision-making and perceived innovation (4.32, $p<.05$). However, relationship between formalization and perceived innovation was not significant.

Significant relationship was also found between concentration of authority and perceived innovation.

Qualitative Results

Most frequently quoted responses which support the main findings are:

Relationship between formalization and innovativeness

* Rules restrict creativity.
* Rules enhance rigidity.
* Rules are against a flexible culture and climate.
* Too much focus on following rules reinforce a fixed way of thinking.
* Encouragement to use tried & tested methods of problem-solving in the organization discourages innovation.
* Too many rules are enemies to innovation.
* Rules are good only to the extent of maintaining discipline, routine and deadlines.

* Rules create a very formal environment in the organization, so people do not feel free to express their ideas.

* Creativity and rules do not go together.

* Divergent thinking requires breaking down of rules, which can lead to innovation.

Overall only 12% employees say that a high level of formalization leads to innovations while 46% say that high formalization does not or may rarely lead to innovation.

Relationship between centralization and innovativeness

Senior Management Responses

* Decentralization allows an organization to rapidly and easily respond to the market.

* Decentralization helps the organization to adapt to changing market conditions.

* Decentralization helps to respond to market competition.

* Decentralization helps innovation since decision making is faster.

* It can be regarded as a stimulating factor for encouraging employees to take control of their tasks.

* With decentralization comes greater flexibility in one's performance of duties.

* There are more opportunities of doing things in different ways, and hence innovation.

Responses of Other Management Levels

* With decentralization, there was greater flexibility in taking decisions regarding one's part of the work.

* Employees were free to prioritize and time their work accordingly.

* For every work we do not have to consult or depend completely upon senior levels, hence, greater time and motivation for innovation.

* Decentralization led to organizational commitment as employees were happy.

* For every decision employees did not have to wait for long for decision-makers to be available.

* Decentralization was positive for both, initiation as well as implementation of innovations.

* Decision making and implementation was speeded up by decentralization.

* Most of the supervisors are well qualified and trained to take day to day decisions.

* As supervisors are highly experienced, they have been committed to the company, and the management can trust them and depend upon them for decision making.

* Decision making has to be delegated to supervisory levels, as any disruptions or problems faced in the manufacturing process have to be immediately attended to and solved. If the problem travels to the top where decisions are

made and solutions travel again to the bottom; by that time already much damage will be done to the process.

Overall 74.30% employees say that low levels of centralization (decentralization) led to innovations.

Relationship Between Concentration of Authority and Innovativeness

A very high number, 83.33% employees said that a low level of concentration of authority led to innovations.

Relationship Between Participation in Decision-Making and Innovativeness

* When ideas come from various levels in an organization, and are then discussed in groups representing different functions and levels of hierarchy; it is definitely an enriching exercise for innovations.
* With Participation in decision making, an idea is technically enriched in content.
* The potential market impact of an idea is also discussed in participative environments.
* Ideas that are found weak are rejected with consensus after discussion.
* Decision making and implementation is speeded up.
* Participation is helpful for idea generation.
* Participative decision making also helps in implementation of innovations.
* Participation leads to greater organizational commitment as employees feel connected.
* Participation in decision making leads to greater job satisfaction.
* Participation in decision making facilitates innovation, as it helps the organization to come up to the competitive standards of the market.

Overall: 88.46% employees said that high participation in decision-making led to innovations.

Discussion

Formalization does not show significant relationship with perceived innovation as correlation and ANOVA scores were not significant. Qualitative findings show a negative relationship between formalization and innovation, as only 12% employees say that a high level of formalization leads to innovations, while 46% say that high formalization does not or may rarely lead to innovation. This is supported by a majority of research presented in literature review. Hence, proposition 1 has been supported.

Centralization shows a highly significant relationship with innovations. Besides a negatively significant correlation and significant ANOVA scores, qualitative results lend strong support. 74.30% employees say that a low level of centralization facilitates innovation. Clearly it shows a negative relationship between centralization and innovations. Research presented in the literature review also shows support for similar findings by most research-

ers that centralization is a negative predictor of innovations, and decentralization is a facilitator of innovations. Proposition 2 has thus been supported.

Concentration of authority also shows highly significant negative relationship with perceived innovation, very similar to centralization. With a negatively significant correlation and significant ANOVA score, the qualitative findings of concentration of authority and centralization are alike, hence, would be the same. Proposition 3 has thus been supported.

Participation in decision making shows significant relationship with innovation. A significant correlation and ANOVA scores are supported strongly by qualitative analysis strongly, as 88.46% say that participation in decision making facilitates innovation, a positive relationship between both variables. Hence, proposition 4 has been supported.

Perceived innovation is a variable which directly informs about the overall approach of the organization towards innovations. It indicates the organization's intentions to amend the system for introducing new products and processes.

Implications

To propel innovations in the pharmaceutical companies, there is a need to increase participation within these organizations. Unfortunately in India participation has not been the focus for top management of many pharmaceutical companies. In fact across the manufacturing sector in India, participative environments especially for the purpose of decision- making have not received enough encouragement.

Participative decision-making is one important way to promote innovations.

Findings of the study indicate that participative decision-making is one important way to promote innovations. Participative safety is the key to building effective participation in decision-making. Research suggests that manufacturing firms of India have been characterized by poor relationships across different management levels or groups (Agrawal, 2010). Hence, an important initiation of organizational leaders should be to promote a participative environment and encourage brainstorming and discussions. This could break many a barrier to innovation.

The pharma units surveyed were also typically the ones who had blissfully ignored participation. They have not encouraged team functioning and team decision-making. Employees thus do not have significant opportunities to get together for discussing new ideas. As a strategy for innovation they should allow more informal meeting of employees and formation of informal groups across the organization. This will help in cross pollination of ideas. It is likely that these groups could get together to nurture and develop positive ideas for innovation, hence, encouraging formation of informal networks within the organization.

Often the informal networks may initiate and nurture process improvement initiatives (Cross, Nohria & Parker, 2002).

Nayar (2010), former CEO of HCL Technologies India, refers to his very positive and encouraging experience of introducing collaborative and participative network in HCL technologies. According to him, employees became very responsive and more involved in the system, and expressed their ideas without inhibitions. The distance between the CEO and the employees decreased. Every employee's suggestions or thoughts mattered to Nayar, as he believed that individuals alone could not have all solutions. The networks bring greater transparency and trust in the system. According to Agrawal and Tyagi (2010) there is high value for collaboration in the manufacturing sector of India and such collaborative and participative networks could definitely benefit the pharmaceutical firms.

Organizations need to provide their employees the freedom to form groups inside the organization with significant others who can support their ideas and help them grow. Gradually these informal groups could develop as product/project teams cutting across the organization structure to develop their ideas. Hence employees themselves can act as change agents or idea-incubators in the organization.

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Incorporation of product teams for new product development can spur innovations. Strategic focus of these firms is new product development, yet they have not extensively functioned as product teams. Teams were formed for specific tasks but are not officially functional. According to middle management interviews, some initiatives for new product development had been shelved or lost mid-way because the management lost interest in pursuing the idea. These lost ideas according to employees had bright potential. If focused teams take charge of different new product/process initiatives, there will be greater ownership of them, and greater is the likelihood that innovation initiatives will reach definite results.

Participation in decision making cannot come without decentralization. As our findings suggest participant organizations have taken steps for decentralization of decision-making. As a part of decentralization, there should be a focus on empowerment of supervisory staff. It is important to note that most employees at the supervisor level in the pharmaceutical firms are skilled, qualified and experienced. They would hence, be considered trustworthy for their decisive role in solving problems that require quick response. They are best aware of day to day problems in the plant, machinery, with workers, and other potential areas of improvement. If powers of the supervisory staff are increased, they can incorporate and implement useful ideas contributed by those who directly encounter day-to-day issues in the manufacturing plant. The supervisory staff can best

communicate the ideas at the bottom to the managers at the top.

The organization needs the support of its primary stakeholders, the employees, to successfully innovate.

The different ways to promote innovations by modifying structural characteristics of the organization would ensure welfare of all business constituents, especially its primary stakeholders. Hence organizational leaders will accomplish corporate stakeholders' management (Shah & Bhaskar, 2011). Important constituents of corporate stakeholders' management like building trust, openness, collaboration and communication (Shah, 2014) can be developed and optimized by promoting participation in decision-making, and building participative safety across the system. The organization needs the support of its primary stakeholders, the employees, to successfully innovate.

Contribution

This study explores effect of four components of organization structure (formalization, centralization, concentration of authority and participation in decision-making) on perceived innovation, hence is enriching. The study proposes a unique measure of innovation, a perceptual measure, which measures perceptions of innovation in an organization, and is called perceived innovation. It is a fairly unique variable as it is difficult to find a documented counterpart in the literature available. Perceived innovation depicts an overall picture of the organization's focus on innovation. It will determine whether the organization is prepared to make changes in its system for the purpose of innovation.

Findings of the study show implications for a globally relevant holistic approach to management, corporate stakeholder's management. The approach to the study of relationships suggested in the current research may be regarded as a basis for speculative thinking and future research.

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