

THE DOMINANT PATTERNS OF INNOVATIVE BEHAVIOR OF A DEVELOPING COUNTRY

S.H. Bhatti¹, S. Nauman², N. Ehsan³

*¹Engineering Management Department,
Center for Advanced Studies in Engineering, Islamabad.*

²Department of Management Sciences, Air University, Islamabad.

*³Engineering Management Department,
Center for Advanced Studies in Engineering, Islamabad.*

ABSTRACT

Innovation is prerequisite for economic development, sustainable growth and competitive advantage of any organization. Researchers have highlighted the importance of adopting innovative strategies that encourage and enhance the practices of innovation. Unfortunately, many organizations of developing countries are still far behind in their adoption of innovative strategies. This paper states the current practices of innovation in the organizations belonging to a variety of manufacturing and services sectors. It focuses on the two of the most important issues in Innovation Management; information sources for innovation and obstacles to innovation in the context of a developing country. Based on the literature review, a questionnaire was prepared and a survey was conducted in a developing country, Pakistan. Results of this survey and its implication on the innovation management in the organizations are also discussed.

Keywords: *Innovation Management, Innovation Survey, Sources of Knowledge and Obstacles to Innovation.*

In today's fast paced economy, technological innovation is a crucial factor as it significantly affects the wealth of consumers, firms, and nations (Tellis, 2008). Innovation adoption and implementation is one of the most important factors of economic and industrial development (Long, 2008). Successful innovation has been associated with the economy growth at the firm as well as at the national level. Schumpeter maintained in his theory that the bulk of private fortunes is directly or indirectly the result of the process of which innovation is the "prime mover" (Schumpeter, 1939). Innovation and creativity has also been identified as effective

method of poverty reduction (Damanpour and Evan, 1984), economic growth (Freeman, 2002), and employment and improve people's lives (Ahlstrom, 2010).

All kinds of innovation including Disruptive, Radical, Complex and Continuous have been linked to competitive advantage of the firms (Tidd *et al*, 2001, Liu, 2005, Necadova, 2010) greater market share (Necadova, 2010), profit margins (Geroski, 1994), productivity (Geroski, 1994, Jianmin and Le, 2007) and growth (Ahlstrom, 2010, Alegre, 2009). In conclusion, innovation is not only responsible for the growth and prosperity but also a critical element of firm's survival (Cefis and Marsili, 2005).

Innovation is just as important, if not more so, for developing countries as it is for developed countries. In a recent research, it has been discussed that innovation and entrepreneurship can be used to reduce the poverty level (Pathak, 2008) and thus increase the quality of life for the people living in less developed countries. However, it is far less studied and practiced in these countries. Most of the researchers have highlighted this lack of innovation knowledge and awareness for these less developed countries (Marins, 2008). Most of the models and frameworks developed in the developed countries may or may not be effective in implementation of innovation in less developed countries due to the difference in economic, social and cultural differences. It is our premise for this research that the first step towards increasing the potential for innovation is to identify parameters to measure. Only then appropriate strategies and policies can be made for effectively managing innovation for a developing country like Pakistan. Therefore, this research takes the first step and establishes a survey instrument based on extensive literature review for investigating the pattern of innovative behavior of firms belonging to a developing country. Further, the reliability of the survey instrument has been tested through appropriate techniques.

In spite of advances in communications, international trade, and public policies promoting scientific cooperation, the access to technological knowledge is not homogeneously distributed over the globe and many countries face difficulties in adopting technologies that are considered outdated in other more developed countries (Archibugi and Coco, 2004). Pakistan is a less developed country with a huge population and poor economy. According to the Global Competitiveness Index (GCI) 2010-2011, it ranks 123 out of 139 nations (World Economic Forum, 2010). In

KEI (Knowledge Economy Index) Pakistan ranks 118 out of 145 countries (after Kenya, Ghana and Uganda) as compared to Turkey at 61, China at 81, and India at 109 (World Bank, 2011). Pakistan must adapt to the norms of the new knowledge based economy otherwise it will even lose its existing share of world exports (Kalim and Lodhi, 2002). Up to our knowledge, no research has been carried out in Pakistan in order to investigate the innovative pattern and measure the innovative activities of Pakistani firms, either at national, institutional or individual level. The current research bridges this gap by carrying out a quantitative survey at firm level. Moreover, some of the important aspects of innovation management have been investigated in this research. Firstly, the existence of financial support from governmental and non-governmental sources has been explored. Next, the paper ascertain the dominant patterns of two of the important aspects of innovative behavior across various sectors i.e. the use of information sources for innovation and the problems faced in implementation of innovation. The indicators used for this purpose have been identified through literature review and were tested empirically for their reliability. The study will be useful for exploring these two phenomena in a variety of sectors in other developing countries as well.

The rest of the paper is organized as follows. In the next section, the concept of innovation is defined and a brief overview of its management is given. The third section provides an overview of various studies done on the information sources and obstacles to innovation. Based on the literature, the fourth section defines the research methodology. Fifth section gives the analysis and results. Finally conclusion is given in the sixth section along with the limitations of the research and areas for future work.

THEORETICAL BACKGROUND

Innovation

The difference between Invention and Innovation is that Invention involves only the discovery of a product, process or a service while Innovation involves the commercial and social utilization of that product, process or a service. The complete understanding of the phenomena of innovation includes two broad areas i.e. technological development and commercialization (Tao *et al*, 2010). Similarly, on the market evolution

side, many theories have tried to explain the phenomenon of innovation. Diffusion of Innovation (DOI) (Rogers, 1995) is one such theory. Tao *et.al.* (2010) have combined both of these research areas in a framework called Innovation Readiness Levels (IRL) with Technology, Market, Organization, Partnership and Risk as the key areas.

The four types of innovation presented by Pellissier (2008) are: (1) **Technical innovation** - this means using or exploiting technology (e.g. social networks by using the technology of internet); (2) **Technological innovation** -it is the technology including the product, method, process etc., (e.g. Open source, Linux); (3) **Organizational innovation** - it includes the manufacturing or marketing processes and systems of individual organizations, organizational strategy or organizational design (e.g. Dell, total quality management, 6-Sigma) and (4) **Leadership innovation** - this is the capability to positively influence human behavior to achieve organizational goals.

Innovation has been linked with economic success and growth of an organization. At the national level, it has been associated with economic success and improved share of exports. At the firm level, R&D is considered with its ability to search and utilize new knowledge (Oslo Manual, 2005). As an example, Procter and Gamble increased their product success rate by 50% and the effectiveness of their R&D by 60% through successful adoption of open innovation concept (Enkel *et. al.* 2009).

Over the years, an expansive definition of innovation emerged in which technological innovation activities were defined as, "... *all of the scientific, technological, organizational, financial and commercial steps, including investments in new knowledge, which actually, or are intended to, lead to the implementation of technologically new or improved products and processes*" (Frascati Manual, 2002).

Oslo Manual adopts this wide definition of innovation and innovative activities. Oslo Manual is a document that has been revised three times and it provides guidelines to develop innovation indicators. The document aims to propose a framework to help different individuals and countries to develop indicators that are comparable (Oslo Manual, 2005).

In light of the above literature research, the innovation for this research is thus defined:

“An **innovation** is the realization of a new or significantly improved product (good or service), or process, a new marketing strategy, or a new organizational method in organizations”.

Innovation Systems

In order to cope with the increasing pressure of globalization in the form of fierce competition based on the dynamics of innovation rather than on the statics of competitive advantage, new strategies and policies are required (Mytelka, 2000). National System of Innovation (NSI) has been defined as the ‘network of agents like private firms, technological intermediaries, universities, etc. and group of policies and institutions that aids in introducing technological processes new to the economy’ (Dahlman and Frischtak, 1993). This concept leads to understanding the manner in which the various set of institutions perform which finally explains their success and competitiveness (Niosi, 2002). The systems of innovation have been defined at the national, regional and sectoral level. This research investigates the national innovation system of a developing country, i.e. Pakistan and discusses its various aspects.

Support for Innovation

Innovation is a quite risky process. It involves many complexities and uncertainties. Many firms fail to encourage or implement innovative activities due to lack of internal financial resources available to them. Various financial sources can be used by the firms in order to overcome this obstacle. The role of governments in the form of subsidy and protection has been highlighted in the research. This in turn helps the firm to gain the competitive advantage by transforming the huge fixed costs of innovation into low unit costs. Additionally, banks and other national and international organizations can lend support to the firms for implementing innovative strategy.

Sources of Knowledge for Innovation

Innovation Sources has been defined as the set of philosophies and premise to guide companies and individuals to search for a new idea or a

practice for achieving a new goal (Tang et. al., 2005). Many researchers studied the dominated sources of knowledge in a particular field. Ciptano (2006) studied the effect of internal and external sources of innovation on the non-financial performance of an organization. While some researchers discovered positive relationship between the use of information sources and performance, others could not find a significant relationship. These discrepancies may be attributed to a lot of different factors, e.g. differences in types of the knowledge concerned, the subject of the knowledge (technology, the market, suppliers, etc.), and a different absorptive capability of companies (Geenhuizen and Indarti, 2005).

Jurado *et. al.* (2009) studied the effects of external knowledge sources (industrial and scientific) and external knowledge strategies (buying and cooperation) on both product and process innovations and the role of internal technological capacities in this effect.

Lin and Lin (2010) found that the two sources crucial for successful adoption of technology are internal and market sources whereas economic and internal factors are the biggest obstacles faced by the firms. Kang and Kang (2009) found that informal networks play a very important part in the adoption of innovation and similarly acquiring technology also aids them to out-perform their competitors. They discovered that R&D alliance has a U-shape effect on innovation performance. This leads to the conclusion that the way the external information is sourced highly affects the relationship between external knowledge and technological innovation. Similarly, Özgen and Ölçer (2007) studied the innovation management activities of manufacturing companies in Turkey and found that R&D and customers are the biggest source of innovation ideas.

Users have been identified an integral source of innovation for a variety of sectors. Fuller *et. al.* (2008) discussed that brand communities can be a priceless resource of innovation in the automobile sector. Failed projects or processes undertaken by the firms can also prove to be a major source of innovation. This is due to the fact that an innovative product or service may create new competence, understanding and expertise even when it is not commercially successful (Townsend, 2010).

As a rule of thumb, the more the knowledge sources, the more the chances of successful innovation (Leiponen and Helfat, 2010). Based on

literature review, a list of eighteen parameters has been used in the survey in order to highlight the important sources of knowledge being used in the industry of Pakistan as shown in Table. 1.

Table 1: Literature Review of Information Sources

Information sources	Oslo Manual	Lewrick et al. (2007)	Bigliardi & Dormio (2009)	Adams et al. (2006)	Paananen (2009)	Robinson & Stubberud (2010)	Jurado et al. (2009)	Lin and Lin (2010)	Gonzalez & Herrera (2010)	Doloreux (2004)	Brusoni et al. (2005)	Townsend (2010)
Other departments within your firm	*			*	*	*		*			*	
Other firms within the organization	*			*	*			*	*		*	
Unfinished/failed projects			*									*
Suppliers of equipment, materials, services, or software	*		*	*	*	*	*	*	*	*	*	
Clients or customers	*		*	*	*	*	*	*	*	*	*	
Competitors or others enterprises in your industry	*		*	*	*	*	*	*	*	*	*	
Experts and Consultants						*			*		*	
Commercial labs, or private R&D institutes	*	*		*			*		*	*		
Universities or other higher education institutions	*	*	*	*	*	*	*	*	*	*	*	
Government or public research institutes and centers	*		*	*	*	*	*	*	*	*	*	
Private Non-profit research institutes	*		*		*			*			*	
Conferences, trade fairs, exhibitions	*	*	*	*	*	*		*			*	
Scientific journals and trade/technical publications	*		*		*	*		*				
Professional and industry associations	*		*			*		*				
Technical, industry or service standards	*											
Patents Disclosures	*		*								*	
ICT resources (including internet)											*	
Informal Networks or personal contacts	*									*		

Obstacles to Innovation

It is important to investigate the perception of barriers to innovation by the companies in order to fully study the innovation pattern. While on one side, the reduction to these obstacles may help the organizations to adopt innovative practices, their awareness is also very important. Some of the researchers that have tried to conduct research in this area are discussed in the paragraph below.

Guijarro *et. al.* (2009) studied hurdles to innovating Spanish organizations consisting of 294 managers of small and medium-sized enterprises (SMEs) and found that these hurdles have different effect on different types of innovation and the most noteworthy barriers are connected to costs, while the insignificant hurdles are related to manager/employee opposition. Savignac (2008) observed the impact of financial restraints on innovative activities of established firms and found that financial restraints considerably hamper the adoption and implementation of innovation in these organizations. Tourigny and Le (2004) studied the effect of obstacles to innovation on a variety of firm characteristics and found that bigger firms are more likely to report the higher cost and organizational inflexibility as important obstacles to innovation than smaller firms. The present research used a set of twenty six indicators has been to identify the common obstacles to innovation faced by the Pakistani firms as shown in Table. 2.

Table 2: Literature Review for Problems and Obstacles to Innovation

Problems and obstacles	Oslo Manual	Bigliardi and Dormio (2009)	Jurado et. al (2009)	Lin and Lin (2010)	Frost (2001)	Doloreux (2004)	Guijarro et. al. (2009)	D'Este et al. (2009)	Elenurm, and Oper (2009)	Tourigny and Le (2004)	Oksanen and Rilla (2009)	Ozgen and Olcer (2007)	Reynolds & Hristov (2009)
Lack of funds within your firm for innovation	*	*	*	*									
Lack of finance from sources outside firm for innovation	*	*	*	*		*	*	*		*	*		*
Innovation costs too high	*	*	*	*		*	*	*		*	*		*
Risk related to the feasibility of the innovation project	*			*			*	*			*	*	*

Problems and obstacles	Oslo Manual	Bigliardi and Dormio (2009)	Jurado et. al (2009)	Lin and Lin (2010)	Frost (2001)	Doloreux (2004)	Guijarro et. al. (2009)	D'Este et al. (2009)	Elenurm, and Oper (2009)	Tourigny and Le (2004)	Oksanen and Rilla (2009)	Ozgen and Olcer (2007)	Reynolds & Hristov (2009)
Lack of R&D Infrastructure													
Lack of qualified personnel within the firm	*	*	*	*		*	*	*	*	*	*	*	
Lack of qualified personnel in market	*		*	*		*	*	*		*		*	*
Lack of resources other than human resources												*	
Lack of info on technology	*	*	*			*		*	*	*			*
Lack of info on market			*	*		*	*	*		*	*		*
Difficulty in finding cooperation partners for innovation	*	*	*			*	*			*	*	*	
Difficulty in finding cooperation partners for marketing	*	*				*	*				*	*	
Inability to devote staff to innovation projects	*									*	*		
Attitude of personnel towards change	*						*					*	
Attitude of management towards change	*						*						
Lack of Entrepreneurial Leadership					*							*	
Lack of incentives for innovation												*	
Shortage of ideas for innovation									*				
Organizational rigidity	*			*						*		*	
Poor coordination/ communication within firm									*			*	
Market dominated by established firms	*		*					*				*	*

Problems and obstacles	Oslo Manual	Bigliardi and Dormio (2009)	Jurado et. al (2009)	Lin and Lin (2010)	Frost (2001)	Doloreux (2004)	Guijarro et. al. (2009)	D'Este et al. (2009)	Elenurm, and Oper (2009)	Tourigny and Le (2004)	Oksanen and Rilla (2009)	Ozgen and Olcer (2007)	Reynolds & Hristov (2009)
Insufficient Government Support							*			*			
Taxes, legislation, regulations	*			*				*		*		*	*
Economic/Political Instability							*						
No need to innovate due to earlier innovations	*		*	*									
No need to innovate due to lack of demand for innovations	*		*	*						*	*		

METHOD

Sample

The questionnaire used for this survey was distributed among various firms of Pakistan, through random sampling. The respondents belonged to a variety of sectors with highest percentage 30.38% belonged to Information Media and Telecom, followed by Professional, Scientific, Technical or Administrative Services.

Measures

The first part of the survey consisted of the demographic information of the firm taking part in the survey. This information includes the sector to which the company belongs, the size of the firm, R&D department and Marketing Department, and the growth in sales over the last three years.

Based on the guidelines by Oslo Manual, the three types of innovation included in the survey are Product Innovation (Goods or services), Process Innovation and Organizational and Marketing Innovation. The variables are all dichotomous recording the information about innovation on yes or no columns.

Based on the literature, a set of parameters were selected to investigate the dominant sources of knowledge for innovation and the obstacles to innovation. The parameters as discussed in the literature review for sources of knowledge for innovation were further sub-divided into two groups, i.e. internal and external sources of knowledge. Among the internal sources are included other departments within your firm, other firms within the enterprise group (organization), and unfinished/failed projects or processes. Among the external sources parameters are suppliers of equipment, materials, services, or software, clients or customers, competitors or others enterprises in your industry, experts and consultants, commercial labs, or private R&D institutes.

The indicators chosen for investigating the obstacles to innovation based on the literature research include the following: Lack of funds inside the firm for innovation, Lack of funds from sources outside the firm for innovation, Risk related to the feasibility of the innovation project, Lack of R&D infrastructure, Lack of qualified personnel within the firm, Lack of qualified personnel in market, Lack of Entrepreneurial Leadership, and Lack of incentives for innovation.

Responses were recorded on a likert scale of 1-7 for 1 representing very low degree of importance and 7 being very high degree of importance.

Next the support to the firm in innovation is questioned with the help of following; Local or central Government, Other related companies, Financial institutions (banks, etc.), Funds from International Organizations.

Survey Administration

The research instrument used for this research is the questionnaire that was prepared in light of the literature review as explained in the paper before. The questionnaire was distributed through email and by hand. Since there was very little awareness in the people regarding these important phenomena, 10% questionnaires were administered through email while 90% were handed over by the authors in person to the respondents giving them detailed introduction and explanation of the topic. It assisted in getting higher response rate.

A total of 200 questionnaires were distributed, out of which 100 were returned but only 80 were received with some usable data with a response rate of 40%. The questionnaires administered in person had higher response rate (approximately 90%) as compared to the response rate of emailed questionnaires (approximately 2%).

Methodology

The survey results were transferred into the statistical software, SPSS (Statistical Package for the Social Sciences). Pie charts and bar graphs were used to study the demographic information of the firms belonging to various sectors. Additionally, cronbach alpha was used to test the reliability of the two main variables, i.e. Information Sources and Obstacles to Innovation. Finally, ranking method (ranking based on the mean score of the parameter) was used to identify the most important and relatively less important sources of knowledge and the obstacles to innovation.

FINDINGS AND RESULTS

The respondents belonged to a variety of sectors with highest percentage of 30.38% belonging to Information Media and Telecom, followed by Professional, Scientific, Technical or Administrative Services. The sector wise distribution of firms is shown in Figure-1.

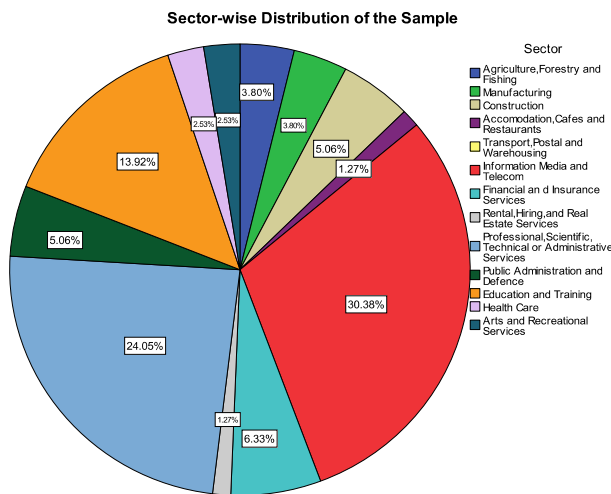


Figure 1: Sector-wise Distribution of Firms

Furthermore, 60% of the firms were private firms with 28.75% of government firms as shown in Figure-2.

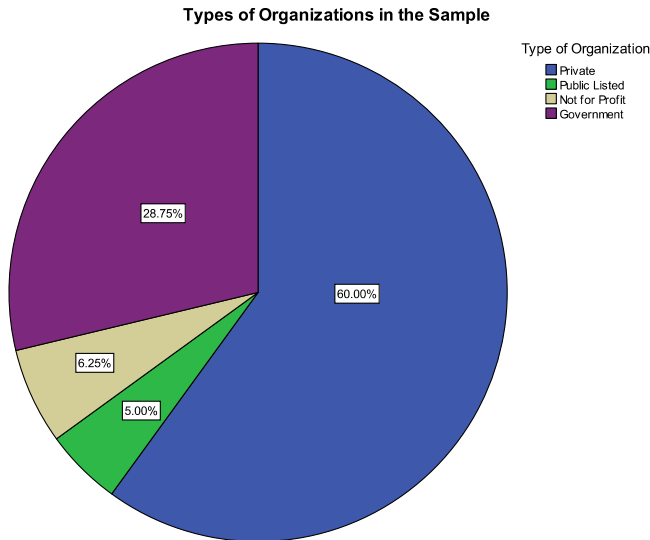


Figure 2: Type of Organizations

Of all the innovation types, Process Innovation was found to be more prominent as 90% of the organizations reported to have implemented Process Innovation in their organizations in the period of last three years. This was followed with 88.2%, 80.5% and 66.2% for Organizational and Marketing, Service and Goods Innovation.

Cronbach Alpha

The cronbach alpha of the sources of knowledge came out to be .913 and .886 for the obstacles to innovation, which are considered to be well above the acceptable values.

Financial Support

67.1% of the total companies reported that they have no support from the government in their innovative efforts. Only two sectors, education and public administration and defense reported as having some significant support (more than 50% of the companies in a particular sector) for their innovative activities (Figure 3). Similarly, 77.6%, 71.1% and 75% of the companies did not receive any financial support from other

organizations, financial institutions, and international organizations respectively; which clearly shows an overall weak financial support for innovation in all the sectors.

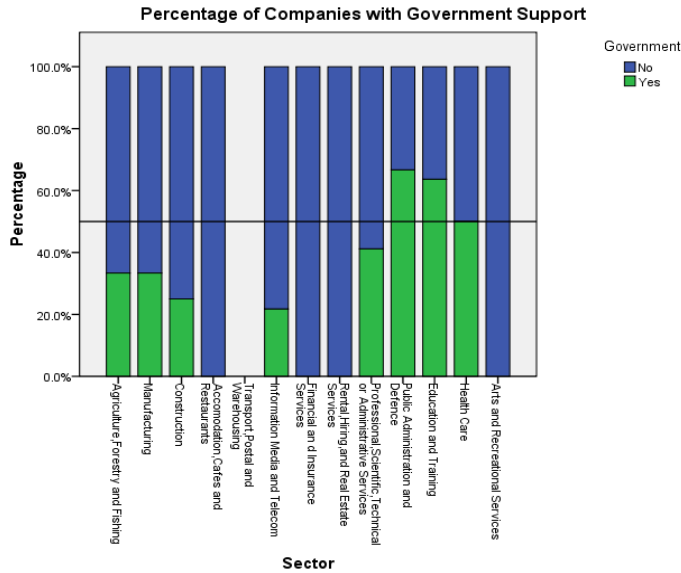


Figure 3: Government Support

R&D and Marketing Departments

36.3% of the companies had no R&D departments at all, whereas 38.8% had less than 50 people in the R&D department. The number of employees in R&D department with respect to the total number of employees in the organization is shown in the Figure 4. The figure shows the increasing trend of R&D department as the size of the firm grows.

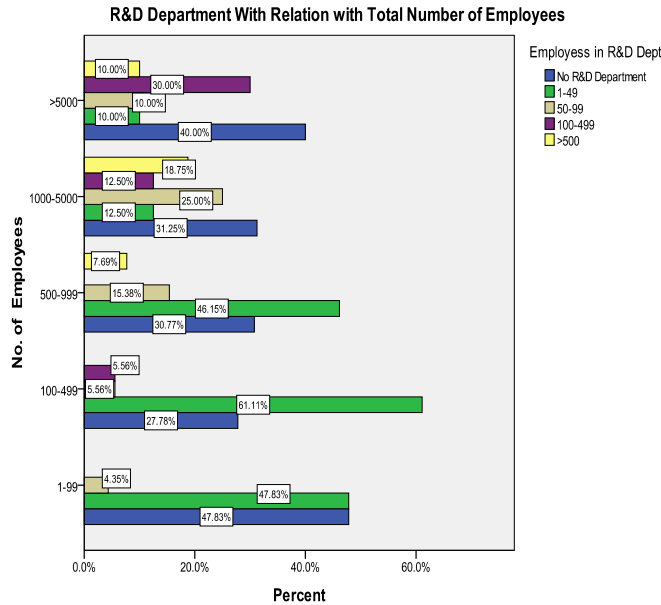


Figure 4: R&D Department

Around 79% of the overall companies reported to have either no marketing department or a relatively small marketing department of less than 50 employees. Just as the case with R&D department, the number of employees in marketing department increases with the total number of employees in that company as shown in the Figure 5.

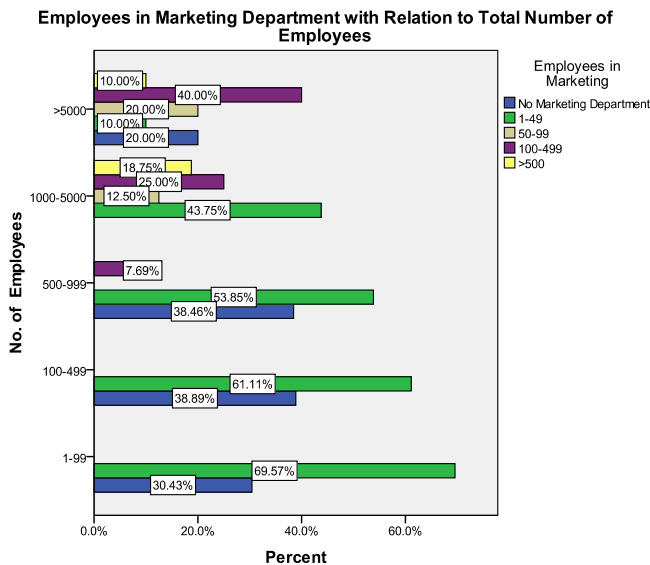


Figure 5: Marketing Department

Sources of Knowledge for Innovation

Table 3 shows the most and relatively less important sources of knowledge along with their ranking and mean scores as rated by the respondents. The ranking of the top three sources of knowledge for all the firms are customers (mean = 5.41), competitors (mean=5.2), and consultants (mean=4.76). While the relatively less important sources were found to be private and not profit institutes (mean=2.78), patents disclosures (3.11), and government and public research institutes (mean=3.22).

Table 3: Ranking of Sources of Knowledge for Innovation

Parameters	Ranking	Mean
Customers	1	5.41
Competitors	2	5.2
Consultants	3	4.76
Gov and Public research institutes	16	3.22
Patents Disclosures	17	3.11
Private non-profit institutes	18	2.78

By looking at the sources score sector-wise accommodation, cafes and restaurants, manufacturing, construction, education and training and information, media and telecommunications are the ones with the highest mean score values for sources of knowledge as shown in the Figure 6.

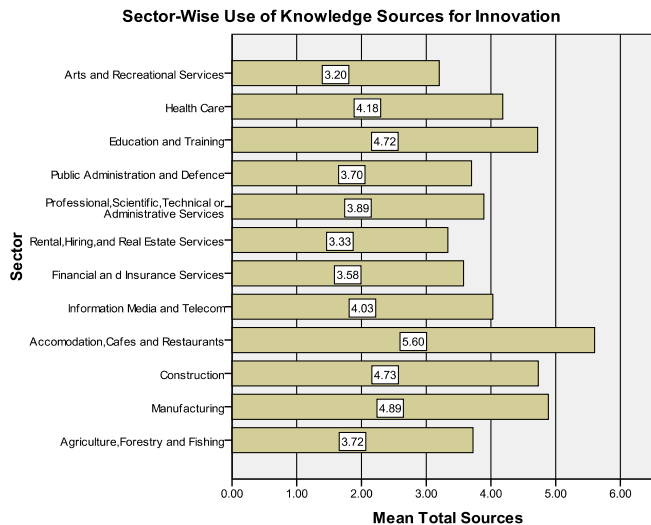


Figure 6: Sources of Knowledge in the Sectors

Obstacles to Innovation

Table 4 shows that the most important obstacles to innovation are market dominated by large firms (mean = 4.71), economic/political instability (mean = 4.29), and high innovation cost (mean = 4.1). The lesser important factors are lack of demand for innovation (mean = 2.92), earlier innovation (mean = 2.96), and lack of information of market (mean = 3.12).

Table 4: Obstacles to Innovation

Parameters	Ranking	Mean
Market dominated by large firms	1	4.71
Economic/political instability	2	4.29
High Inn costs	3	4.1
Lack of info of market	24	3.12
Earlier Innovations	25	2.96
lack of demand	26	2.92

Analyzing the obstacles to innovation sector-wise, the sectors with highest scores of obstacles to innovation are accommodation, cafes and restaurants, agricultural, forestry and fishing, public administration and defense, education and training and manufacturing, as shown in Figure 7.

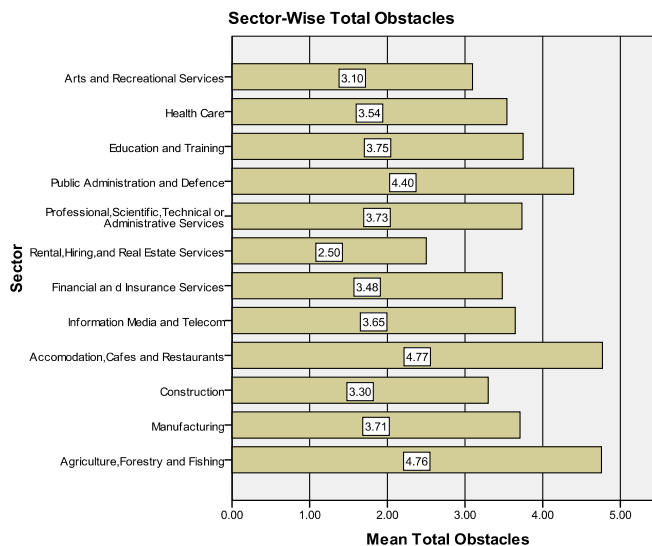


Figure 7: Obstacles to Innovation

DISCUSSION AND LIMITATIONS

The current research has produced some very interesting results. Although, the research has its limitations (they will be discussed in the last part of this section) but still this study has highlighted some of the very important aspects of innovation management in the context of a developing country like Pakistan.

The results indicate that government has very limited or low involvement in promoting the innovation activities in the firms of Pakistan; as a high percentage of firms show that they did not receive any support from government in their innovative endeavors. But a relatively higher lack of financial support from other sources namely Other Organizations, Financial sources (e.g. Banks etc.) and International Organizations also show an overall lack of tendency or awareness among the Pakistani firms in getting finances for their innovative activities.

With regard to organizational structure, the organizations show very similar trends. More than 75% of the organizations had either no R&D or Marketing Departments or the departments have less than 50 employees.

Among the innovation types, the most predominant innovation adopted in organizations was the Process Innovation. The “Technological Innovation” was found to be less practiced. This highlights the importance of this type of innovation and steps should be taken by the government in order to promote this type of innovation.

The finding of the present research is in line with the previous research as it also highlights the importance of users and customers as the most significant source of knowledge for innovation (Fuller *et.al.*, 2008, Robson and Kenchatt, 2010). However, the findings also point out towards a serious lack of activity from the institutions, both governmental and non-governmental in helping the companies in their innovative activities. Universities, an integral part of the “Triple Helix” is also among the least used sources on knowledge and information for innovation. It is the need of the hour that the cooperation between academia and industry should be encouraged and channels of collaborations between the two must be established.

Most of the top barriers to innovation are related to the environmental context of the firms. Pakistan being the neighboring country of Afghanistan suffered badly after the recent war on terror. The Political and Economic instability have further increased the chances of poor innovation performance of the firms. In addition, the low awareness and/or unavailability of finances (as discussed above in the paper) have increased the innovation obstacle of “Innovation being too costly”. Last but not the least, the attitude of personnel towards innovation also turned out to be an important obstruction of innovative activities of Pakistani organizations.

As far as the sectors are concerned, the response from both services and manufacturing companies was mixed. The companies that ranked well in using knowledge sources for innovation ranked the obstacles to innovation high as well. This can safely be attributed to the fact that the companies that understand the importance of knowledge for innovation are also well aware of the obstacles to the innovation (Veugelers and Cassiman, 1999). One important point here is that two of the sectors (i.e. Public Administration and Defence, and Education and Training) that reported to have the highest financial support from government still ranked high in the obstacles to innovation. This might mean that may be the barriers to innovation are inherent in the organizational structure and attitude of the people rather than financial constraints.

Since the survey was conducted by the researchers without any help from governmental bodies, the limitation of this research is that financial information related to innovation like R&D spending, could not be added to the questionnaire. Furthermore, no survey on innovation was ever done before in Pakistan on this topic, so the respondents found it difficult to understand some of the aspects. This limitation was overcome by personally supervising the questionnaires. For future research, the sample size should be increased and more sectors should be added in the research in order to generalize the findings and get meaningful results for the purpose of innovation policy making of Pakistan.

CONCLUSIONS AND FUTURE WORK

Despite its importance, innovation management in developing countries is a relatively new field. With the advent of the concept of innovation as a system, the focal of innovation policy has been shifted towards highlighting the relationship between various institutions, and supporting these interactive processes in the development, the diffusion and implementation of knowledge (Oslo Manual, 2005).

Up to our knowledge, this study is first of its kind as no research has tried to investigate the innovative behavior of Pakistanis companies before. Pakistan is a highly populated poor country which ranks very poorly in the competitive ranking. Since innovation has been strongly associated with the productivity and growth of the organizations, innovation can play a major role in reviving the economy and improving the balance of the country.

This research has a lot of implications for the development and management of innovative activities of the Pakistani firms. By identifying and quantifying we can assess which areas need support from government and special attention by the management.

It is about time that the Pakistan's Government realizes the importance of innovation and helps companies financially and otherwise (e.g. training) in order to encourage the companies to increase their innovative activities. The first step towards this would be to start an innovation survey of the Pakistan's companies at a national level. Based on this data, an innovation policy should be chalked down and implemented.

Future work in this area can be done by adding the financial information of the innovative activities of the companies. This might include the budget allocated for innovative activities and R&D spending. Additional information regarding Intellectual Property (IP) practices of the firms should also be included in the innovation survey. Based on this data and more extensive survey, innovation framework should be developed for policy formation and implementation.

REFERENCES

- Adams, R. Bessant, J. and Phelps, R. (2006), "Innovation management measurement: A review", *International Journal of Management Reviews*, Volume 8, Issue 1, pp. 21-47.
- Ahlstrom, D. (2010), "Innovation and Growth: How Business Contributes to Society", *Academy of Management Perspectives*, Volume 24, Number 3, pp. 11-24.
- Alegre, J. Chiva, R. and Lapiedra, R. (2009), "Measuring innovation in long product development cycle industries: an insight in biotechnology", *Technology Analysis & Strategic Management*, Vol. 21, No. 4, pp. 535-546.
- Archibugi, D. and Coco, A. (2004), "A New Indicator of Technological Capabilities for Developed and Developing Countries (ArCo)", *World Development*, Vol. 32, No. 4, pp. 629-654, 2004.
- Bigliardi, B. and Dormio, A.I. (2009), "An empirical investigation of innovation determinants in food machinery enterprises", *European Journal of Innovation Management*, Vol. 12, Issue 2, pp. 223-242.
- Brusoni, S. Marsili, O. and Salter, A. (2005), "The role of codified sources of knowledge in innovation: Empirical evidence from Dutch manufacturing", *J Evol Econ*, Vol. 15, pp. 211-231.
- Cefis, E and Marsili, O. (2005), "A matter of life and death: innovation and firm survival", *Industrial and Corporate Change*, Volume 14, Number 6, pp. 1167-1192.
- Ciptono, W. S. (2006), "A Sequential Model Of Innovation Strategy – Company Non-Financial Performance Links", *Gadjah Mada International Journal of Business*, Vol. 8, No. 2, pp. 137-178.
- D'Este, P. Iammarino, S. Savona, M. and Tunzelmann, N. (2009), "Revealed Versus Detering Barriers to Innovation-Evidence from the 4th CIS (CIS4)", May, DIUS Research Report 09-09.
- Dahlman, C., Frischtak, C., (1993), "National systems supporting technical advance in industry: the Brazilian experience", in Nelson, R. (Ed.), *National Innovation Systems – A Comparative Analysis*, Oxford University Press, New York.
- Damanpour, F. and Evan, W. M. (1984), "Organizational innovation and performance: The problem of organizational lag", *Administrative Science Quarterly*, Vol. 29, pp. 392-409.

- Doloreux, D. (2004), "Regional Innovation Systems in Canada: A Comparative Study", *Regional Studies*, Vol. 38.5, pp. 481-494.
- Elenurm, T. and Oper, J. (2009), "Innovation Obstacles and Management Focus in Estonian Enterprises", *EBS Review*, No 25, pp. 74-88.
- Enkel, E Gassmann, O. and Chesbrough, H. (2009) "Open R&D and Open Innovation: Exploring the Phenomenon, *R&D Management*, Vol. 39, No. 4, pp. 311-316.
- European Commission, "The Measurement Of Scientific And Technological Activities Proposed Guidelines For Collecting And Interpreting Technological Innovation Data; Oslo Manual", Organisation for Economic Co-operation and Development, OECD and Eurostat, Paris, 2005.
- Freeman, C. (1995), "The 'National System of Innovation' in Historical Perspective", *Cambridge Journal of Economics*, Vol. 19, pp. 5-24.
- Frost, T.S. (2001), "The Geographic Sources of Foreign Subsidiaries' Innovations", *Journal of Strategic Management*, Vol. 22, pp. 101-123.
- Fuller, J. Matzler, K. and Hoppe, M. (2008), "Brand Community Members as a Source of Innovation", *The Journal of Product Innovation Management*, Vol. 25, pp. 608-619.
- Geenhuizen, M. and Indarti, N. (2005), "Knowledge as a Capital Resource in Innovation Among Small Business Companies in Indonesia-An Exploration", *Gadjah Mada International Journal of Business*, Vol. 7, No. 3, pp. 371-390.
- Geroski, P. (1994), *Market Structure, Corporate Performance and Innovative Activity*, Oxford University Press, Oxford.
- Gonzalez, G. S. and Herrera, L. (2010), "The influence of R&D cooperation on innovatory effort", *Innovation: Management, policy & practice*, Vol. 12, pp. 337-354.
- Guijarro, A.M. Garcia, D. and Auken, H.V. (2009), "Barriers to Innovation among Spanish Manufacturing SMEs", *Journal of Small Business Management*, Vol. 47, No. 4, pp. 465-488.
- Jurado, J. V. Gracia, A. G. and Lucio, I. F. (2009), "Does external knowledge sourcing matter for innovation? Evidence from the Spanish manufacturing industry", *Industrial and Corporate Change*, Vol. 18, No. 4, pp. 637-670.
- Kalim, R. and Lodhi, S. A. (2002), "The Knowledge-based Economy: Trends and Implications for Pakistan", *The Pakistan Development Review*, Vol. 41:4, Part II, pp. 787-804.

- Kang, K. H. and Kang, J. (2009), "How Do Firms Source External Knowledge for Innovation? Analysing Effects of Different Knowledge Sourcing Methods", *International Journal of Innovation Management*, Vol. 13, No. 1, pp. 1-17.
- Lazonick, W. (2008) "Entrepreneurial Ventures and the Developmental State: Lessons from the Advanced Economies", IKD Working Paper, No. 35, Open University Research Centre on Innovation Knowledge and Development September 2008.
- Leiponen, A. and Helfat, C. E. (2010), "Innovation Objectives, Knowledge Sources, and the Benefits of Breadth", *Strategic Management Journal*, Vol. 31, pp. 224-236.
- Lewrick, M. Raeside, R. and Peisl, T. (2007), "The Innovators' Social Network-A cross-sector exploration on the influence of social networks and social capital on innovation and success", *J. Technol. Manag. Innov.* Vol. 2, Issue 3.
- Lin, H. and Lin, E. S. (2010), "FDI, Trade, & Product Innovation: Theory & Evidence", *Southern Economic Journal*, Vol. 77, No. 2, pp. 434-464.
- Liu, C. C. (2005), "An Empirical Study on the Construction of a Model for Measuring Organisational Innovation in Taiwanese High-Tech Enterprises", *International Journal of Innovation Management*, Vol. 9, No. 2, pp. 241-257.
- Long, D. E. (2008), "Crossing the Innovation Divide", *Temple Law Review*, Vol. 81, pp. 507-544.
- Marins, L. M. (2008), "The Challenge Of Measuring Innovation in Emerging Economies' Firms: A Proposal of a New Set of Indicators on Innovation", *UNU-MERIT Working Papers*, No. 2008- 044, pp. 1-28.
- Mytelka, L. K. (2000), "Local Systems of Innovation in a Globalized World Economy", *Industry and Innovation*, Vol. 7, No. 1, pp. 15-32.
- Necadova, M. (2010), "Innovative Activities in Domestic Firms and Foreign Controlled Firms - The Results of Primary Research" *Economics and Management*, Vol. 15, pp. 159-163.
- Niosi, J. (2002), "National systems of innovations are "x-efficient" (and x-effective) Why some are slow learners", *Research Policy*, Vol. 31, pp. 291-302.
- Oksanen, J. and Rilla, N. (2009), "Innovation and Entrepreneurship: New Innovations as a source of Competitiveness in Finnish SMEs", *International Journal of Entrepreneurship*, Vol. 13, Special Issue.

- Organisation for Economic Co-operation and Development, "Frascati Manual Proposed Standard Practice for Surveys on Research and Experimental Development, OECD, Paris, 2002.
- Özgen, H. and Ölçer, F. (2007), "An Evaluative Study of Innovation Management Practices in Turkish Firms", *International Journal of Business Research*, Vol. VII, No. 2, pp. 53-63.
- Paananen, M. (2009), "Exploring the Relationships between Knowledge Sources in the Innovation Process: evidence from Finnish innovators", *Technology Analysis & Strategic Management*, Vol. 21, No. 6, pp. 711-725.
- Pathak, R. D. (2008), "Grass-root creativity, innovation, entrepreneurialism & poverty reduction", *Int. J. Entrepreneurship and Innovation Management*, Vol. 8, No. 1, pp. 87-98.
- Pellissier, R. (2008), "A Conceptual Framework for the Alignment of Innovation and Technology", *Journal of Technology Management & Innovation*, Vol. 3, Issue 3, pp. 67 - 77.
- Reynolds, J. and Hristov, L. (2009), "Are there barriers to innovation in retailing?" *The International Review of Retail, Distribution and Consumer Research*, Vol. 19, No. 4, pp. 317-330.
- Robinson, S. and Stubberud, H. A. (2010), "Inspiring Innovation in Norway", *Proceedings of the Academy of Studies in International Business*, Vol. 10, No. 2, pp. 26-31.
- Robson, S. and Kenchatt, M. (2010), "First findings from the UK Innovation Survey 2009", *Economic & Labour Market Review*, Vol 4, No 3, pp. 28-35.
- Rogers, E., (1995), *Diffusion of Innovations*, The Free Press, New York.
- Savignac, F. (2008), "Impact of Financial Constraints on Innovation: What Can Be Learned From a Direct Measure?", *Econ. Innov. New Techn.*, Vol. 17, No. 6, pp. 553-569.
- Schumpeter, J. A. (1939), *Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process*, 1st edition, McGraw-Hill Book Company Inc., New York and London.
- Tang, Z. Chen, R. and Ji, X. (2005), "An Innovation Process Model for Identifying Manufacturing Paradigms", *International Journal of Production Research*, Vol. 43, No. 13, pp. 2725-27421.
- Tao, L. Probert, D. and Phaal, R. (2010), "Towards an integrated framework for managing the process of innovation", *R&D Management*, Vol. 40, No. 1, pp. 19-30.

- Tellis, G. J. (2008), "Important Research Questions in Technology & Innovation", *Industrial Marketing Management*, Vol. 37, No. 6, pp. 629-632.
- Tidd, J. Bessant J. R. and Pavitt, K. (2001), *Managing Innovation: Integrated Technological, Market and Organizational Change*, 2nd Edition, Wiley, Chichester.
- Tourigny, D and Le, C. D. (2004), "Impediments to Innovation Faced by Canadian Manufacturing Firms", *Econ. Innov. New Techn.*, Vol. 13(3), pp. 217-250.
- Townsend, W. (2010), "Innovation and the Value of Failure", *International Journal of Management and Marketing Research*, Vol. 3, No. 1, pp. 75-84.
- Veugelers, R. and Cassiman. B. (1999), "Make and buy in innovation strategies: evidence from Belgian manufacturing firms", *Research Policy*, Vol. 28, pp. 63-80.
- World Economic Forum (2010), "The Global Competitiveness Report 2010-2011", World Bank, available at: <http://info.worldbank.org/etools/kam2>, (accessed on 29, 11, 2011).