Link between Product Innovation and Non-Technological: Organization Performance

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Abstract: This study aims to provide a link between Product Innovation (PI) and Non-Technological Innovation (NTI) in innovation process. It also give the effect of PI and NTI on organization performance. The paper gives empirical evidence of theoretical hypothesis on a sample size of 40 firms from the manufacturing sector of Pakistan. Data was analyzed through different statistical tools. The study concluded that there is a link between PI and NTI in the organization. Findings also indicates that PI and NTI has also effect on organization performance. These findings are only guaranteed only to the small and medium size of organizations. Pakistan is also a developing country. Use of modern technology in PI and NTI will also effects the results in developed countries. Findings of this study are help full to the manufacturing industry of Pakistan and other developing countries. This paper also shows the practical implication of innovation and its sub categories on the performance of the organization.

Key words: Marketing innovation, non-technological innovation, organizational innovation, organization performance, product innovation

INTRODUCTION

Innovation provides an opportunity to businesses to lower their cost in the shape of Process innovation and to introduce new products with different verities in shape of PI (Innovation, 2005). Then marketing innovation leads the business towards new ways of marketing like product placement, pricing, promotion etc. Organizational innovation has also important in which new business practices, internal and external relations of Business has been analyzed and implemented (Tobias and Christian, 2007). Innovation has a relation with the productivity and per capita of the organization and economy (Someshwar et al., 2001).

Technological change has also transformed the quality of life all over the world. However there is no comprehensive policy prevails in Pakistan to foster the innovation in public and private sector of Pakistan. On 29 April 2009 a meeting was held between Ministry of Finance-Pakistan and USAID in which 12 pillars are defined for innovation Ecosystem. The meeting found that the things which are done in Pakistan are the piece meal and limited in scope. After this meeting Pakistan Innovation Board was establish first time in Pakistan to address the Innovation Issue (CSF, 2009). Well planned initiatives are needed to foster innovation in Pakistan which should have the goal to, enhance R and D for innovation, create job opportunities and wealth creation in Pakistan, to create national image of innovation, and to utilize innovation for the betterment of the people of Pakistan. At present Pakistan is facing capacity limitation to carry out innovation at par with the Globe. (Qasim and John, 2011).

In this study we will study the link between PI (Product Innovation) and NTI (Non-technological Innovation). Small numbers of studies are there on technological innovation, NTI, Product, and Process Innovation. While our approach is that, we will relate comparatively, a general variable (NTI) with a specific variable (product Innovation). This work is in line with Mothe who, in 2010 showed the relationship of technological and NTI and recommended some future studies in this area. I selected this topic to show the relationship between PI and NTI empirically. So, from this line of research the question is to see the relationship of non-technological strategies on PI and vise versa. (Caroline et al., 2010)

As innovation is the most important factor, to be considered for the organization, economies and at the government level. Linking PI to NTI will give another direction for researchers and strategist and will increase the body of knowledge in this area. For strategist, because they can formulate strategies and their effect on Product. Our study is also beneficial for those organization which have low budget for their R & D departments. This study provide justification to critically examine their marketing and organization strategies to further innovate their products. As Pakistan is also an developing country, where small amount has been used on R & D every year, in most organization. Than Innovation (2005) has also been ignored because of many reasons. This study also helpful for entrepreneurs in Pakistan to learn more about innovation and will enhance the body of knowledge about innovation with reference to Pakistan.
LITERATURE REVIEW

Innovation has been defined in OSLO Manual, 3rd Edition as introduction of new Product (goods and services), a new marketing plan, a new process, or a new organizational method for business practice relating to internal or external relations of business. Innovation could be distinguished into four types, Product, Process, Organizational and Marketing Innovation. (OECD, 2005). Innovation has not an universal definition. Different authors defined innovation differently. However, a Table I for innovation, which is helpful to understand this concept (Jaranee, 2004).

Innovation is the deliberate effort to bring into existence, a new way or some thing new which have its value/utility and can be repeated and sustained. It always focuses on practicability, i.e. making a new tools, products, or process. Which are beneficial for the human being and allows human being to achieve goals, which were not achievable previously. (Jim, 1999).

Here we will define PI. Product Innovation involves the conceptualization, commercialization, development, design and validation of new product which provide higher value/utility to all the stakeholders of that product. It is a basic approach of creating competitive advantage in the global business environment (Rainey, 2005). PI is defined by different scholars differently. Product is the development of a new product or any variation in the existing design of the Product, use of any new raw material for its production, addition of any other feature and components in the existing product is called Product Innovation. In other words thing which is new for business product is consider as product innovation. (Innovation, 2005). Product Innovation effects every part of the organization. Strategic planning, sales costumers, shareholders, finance department, purchase department and operation department all are affected by Product Innovation. (Rakesh et al., 2006).

Differentiating the innovation on the basis of technology leads towards two types of innovation. Technological innovation and non-technological innovation. While Technological Innovation is characterized by new technical knowledge of production, new products (goods and services) and use of new material in production. However, NTI not includes the change in technology. It includes new business methods, new organization concepts, or other non technological ways of achieving business objectives (Tobias and Christian, 2007). Flikkema et al. (2007) further distinguished technological innovation from non-technological innovation. New marketing techniques, modification in the organization management and changes in organization structures are categorized in non-technological innovation. (Flikkema et al., 2007). The major type of non-technological innovation are the organizational and managerial innovation. These two type of innovation are purely excluded from technological innovation. (OSLO, 1997).

Changes in the product placement, pricing, design, promotion and packaging to better address the demands of costumer with an objective of maximization of profit. Product design here refers to the change in size, appearance or in form. It doesn’t include the change in the features of the Product (OECD, 2005). Marketing innovation has three dimensions which are price strength, product strategy and promotion strategy. Product strategy refers to the appearance and forms of product. It doesn’t include the features changes in the product. However, price strategy includes the decisions regarding prices and promotion includes the placement of product etc. (Rust et al., 2004). Business which are not market orientation and does not focuses on marketing innovation cannot achieve the competitive advantage in the market. Hence marketing innovation provides the businesses an opportunity to get competitive advantage. (Stanley and John, 1999). Organizational innovation can be differentiated from other activities. It includes the implementation of organization methods in business practice workplace organizations or external relations that are not previously implemented by the organization. These methods allows the organization to achieve its strategic goals. (OECD, 2005). Organizational innovation from the cognitive perspective shifts in organization structure and system for the purpose of organization learning and knowledge creation. (Alice, 2004). Managers should be trained to manage the innovation. Managers from all department should know how to create optimal level of organizational innovation to achieve the organizational strategic objectives. (Bruce, 2001). Organizational Innovation management programs is able to practically help the organization to facilitate the implementation and provides a series of tools for manufacturing organization to know their status in managerial practices (Wong and Chin, 2007).

PI and development are critical in organization for their existence and competitiveness. PI can seriously derive the performance of the organization and enables the organization to better utilize the available resources to contribute towards the market share of the organization (Chux, 2010). To build and sustain the competitiveness in the industry, PI strategy must be aligned with leadership and investment strategy. First-entered product in respect of innovation has very immediate and long term effect on the yield of the company. So organization must focus on innovation, even though organization may lose temporarily but firm will enjoy long term gains (Wooseong and Mitzi, 2008). PI will increase the sales of the firms and ultimately there is a increase in the productivity in the economy. This effect will also boost
up the employment of the country. His will also triggers the development of the organizations indirectly. (Demetris, 2011).

At Macro level PI is also an important driver of exports of the country. Policy makers are considering PI as an important factor for increase in exports. (Bruno and Ester, 2007). PI is also dependent on the infrastructure of that geographical area. It is also dependent on the historical R&D, industrial services and other export services (Maryann and Richard, 1994). Market leaders are normally very aggressive for PI and those who are targeting market Niche are very flexible about PI. Companies who are quick to response for innovation, only those can survive in the market (Yen, 2009). Competitive firms never compete with their compete with the those can survive in the market (Yen, 2009). Competitive firms never compete with their competitors with the traditional ways of marketing and organization techniques. These firms always offer innovative products to their costumers. (Sabai et al., 2010). To increase the performance of the firms, management have to focus for achieving of product and process innovation (Ilker and Birdogan, 2011). In developing countries the success rate of completely new products in less than the developed countries. So the countries are building innovation in their products to bring gradual change in the minds of the costumer. (Mahesh and James, 2008).

Marketing and organizational innovation effects the performance of the organization in terms of sales and cost reduction. It also effects the profit margin of the firm. (Tobias and Christian, 2007). During the past two decades number of products were failed to compete in the markets due to less marketing innovation techniques. There is a simultaneous need of NTI with PI. Owing to other traditional innovation techniques, marketing innovation have proved to be vital enough for small and medium organizations (Vlachaki, 2009-2010). Highly creative and new marketing campaigns are helpful to gain marketing share. As technology evolve the globalize new marketing techniques are also necessary for brand loyalty. (CMO, 2009). Progress in the technological innovation will also require greater efforts to bridge the difference in organization structures and business methods. This will effect the organization learning and knowledge management which is ultimately beneficial for the organizations (Alice, 2004).

Organizational innovation and marketing are the parts of NTI (OECD, 2005). To increase the production efficiency and quality related practices firms focus on organizational development and innovation. Its aggregate effect is on the increase in the performance of the organization. (Surendra and Wulong, 2004). Individual characteristics like task perception, demographic backgrounds and working environment are the factors which contributes towards are organizational innovation (year) in the firms. (Karin et al., 2011). Innovative marketing strategies are the part of change process. Managers should pay close attention to innovate market strategies continuously to gain competitive advantage. (Liqin et al., 2010).

Defining the organization performance may vary from organization to organization or industry to industry. But there are some universal rules which can lead an organization towards success. These are organizations having financial outcome, satisfied customers, satisfied employees, high levels of individual initiative, productivity, and innovation. Organizations which have achieved high performance-including mission, vision, aligned performance measurement and reward systems, and strong leadership. (Epstein, 2004). According to André (2008) High Management Quality, Openness coupled with Action Orientations, Long Term Commitment, Focus on Continuous Improvement and Renewal, High Workforce Quality, are the factors which contributes toward high performance organizations.

Hypothesis:
H1: There is a significant relationship between PI and NTI.
H2: The higher a organization’s PI, the higher its performance.
H3: The higher a organization’s NTI, the higher its performance.

MATERIALS AND METHODS

Model: This model is basically the recommendation of a previous study which was conducted in 2010 by Caroline Mothe. This study provides the link between PI and NTI. In addition to this study also provide the effect of PI and NTI on organization performance. In the second stage of the study we took PI and NTI as a Independent variable and Organization performance as a dependent variable.

Data and empirical methodology: Data was collected from a manufacturing firms in Pakistan through a questionnaire. The questionnaire was developed to prove the link between PI and NTI, and their effect on organization performance. A sample of of 50 employees were selected from the manufacturing industry in Pakistan. Out of these 50 questionnaire we received 35 questionnaires back.

The 12 items of questionnaire measuring link between PI and NTI and their effect on organization performance were subject to a principal components analysis. The reliability coefficients, means, and standard deviations, among the study variables are contained in Table 2.

As shown in Table 1, the internal reliabilities of scales were between 0.814, 0.714 and 0.511 which is clearly acceptable. Whereas standard deviations of the
Table 1: Description of main variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S D</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI</td>
<td>4.09</td>
<td>0.787</td>
<td>0.814</td>
</tr>
<tr>
<td>Non-technology innovation</td>
<td>3.83</td>
<td>0.80</td>
<td>0.741</td>
</tr>
<tr>
<td>Organization performance</td>
<td>3.56</td>
<td>1.05</td>
<td>0.511</td>
</tr>
</tbody>
</table>

Table 2: Correlations

<table>
<thead>
<tr>
<th></th>
<th>Avg. PI</th>
<th>Avg. NTI</th>
<th>Avg. OP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. PI Pearson correlation</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avg. NTI Pearson correlation</td>
<td>0.766**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>40</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Avg. OP Pearson correlation</td>
<td>0.771**</td>
<td>0.702**</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>40</td>
<td>40</td>
<td>40</td>
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**: Correlation is significant at the 0.01 level (2-tailed).

Table 3: Regression result between PI, non technology innovation and organization performance

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Standard β</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI</td>
<td>0.563</td>
<td>0.001</td>
</tr>
<tr>
<td>Non technology</td>
<td>0.271</td>
<td>0.091</td>
</tr>
<tr>
<td>R</td>
<td>0.790</td>
<td></td>
</tr>
<tr>
<td>R^2</td>
<td>0.624</td>
<td></td>
</tr>
<tr>
<td>Adjusted R^2</td>
<td>0.604</td>
<td></td>
</tr>
<tr>
<td>F-value</td>
<td>30.74</td>
<td></td>
</tr>
</tbody>
</table>

variables were either close to or exceeded 1.0, indicating that the study variables were discriminatory.

Table 2 illustrates the correlations among the subscales obtained using Pearson correlation to determine whether the subscales were independent measure of the same concept. Correlation between NTI and organization performance is 0.771**, correlation between PI and Organization performance is 0.702** and correlation between NTI and PI is 0.766** (p<0.01). The results have demonstrated acceptable level of correlations.

Multiple regression analysis was carried out to test the hypotheses that comprised the direct and moderating effects of PI and NTI. Tables present the results of the analyses. As noted in Table 3, Step 1 was found to be significant (p<0.01). Hence the direct effects of the predictors significantly explained 62 and 60% of the variability in PI and NTI (Table 3).

**DISCUSSION**

Organizational and Marketing are two main parts of NTI (OECD, 2005). Owing to the importance of R & D department non-technical activities are also essential for innovation process. When a product is introduced in the market is is the marketing department which will give feed back from the costumers. After that the organization will enhance the product attributes according to the demand of Market. Here, marketing activities indirectly effects the product development. (Caroline et al., 2010). The core of the organizational innovation is to innovate the product which can better satisfy the needs of the costumer. (Ruth, 2008).

All types of innovation is dependent on human capital of that organization. So, the marketing staff which will bring feedback to the production department is creating a bridge between marketing and PI. Further price is placed in the jurisdiction of NTI which is the single biggest constraint while developing a product. (Mahesh and James, 2008). When we see the PI and marketing relationship, which gives us the view that PI will give new challenges to Marketing department, Marketing department needs to innovate itself for better promotion of the new product. This also show link of product and Market innovation. (Patrick, 2003). When there was any PI in the organization it also demands some new marketing efforts which are better then the existing efforts. So PI leads to the marketing innovation. Organization innovation is also perquisite for technological innovation. If organization factors, (values, interests and capacity of learning of the workforce) changes then this will directly effect the management and hiring of the production department. These findings also authenticating the link between NTI (organization innovation) and PI. (Alice, 2004). All above studies support H1 of this study, hence we will accept H1.

Organizational innovation is the only factor which contributes to higher total factor productivity. PI will only provide maximum benefit, if it is performed with the combination of organizational innovation. The linkage of both will give maximum results. (Michael et al., 2010). Organizations some times innovate their selves and focus on product oriented organization structures, which lead toward the improved in products. Implementing Just-in-time and supply chain management are the part of organizational innovation. Which actually smooth’s and facilitates the PI process. (Armbruster et al., 2008). Organization structure and its environment both transforms NTI which leads toward increase in innovation in the organization. Innovation has also positive effect on organization performance. (Leslie et al., 2005). These studies support H2 of this study, hence we will accept H2.
Collection and use of new market information assists to trigger up marketing innovation in the firm, which has also an ultimate effect on the performance of the firm in them market. (Sabri et al., 2004). PI can act as mediating role between organization support on organization performance. Managers must select and pursue PI as primary strategic goal to achieve high performance of the organization. (Bostjan and Otmar, 2004). Organization designs have high impact on the firms ability to explore and exploit new products and resources. New resources and products has positive effect of firm’s financial performance and on overall performance as well. (Michael et al., 2006). Employee training, motivation and process control have a positive effect on technological innovation. PI is the dimension of technological innovation. So the technological innovation has a positive effect on performance of the organization (Yuan et al., 2006). Policies and practices in the workplace are dimensions of NTI. This has a positive effect on the performance of the organization. (Frank, 2011). Organization innovation significantly effects the performance of the firms. More specifically organization innovation is the key factor to accelerates financial performance and market innovation. On the other hand market innovation also boost up the performance of the organization. So NTI has multiple effects on organization performance. (Li-an, 2011). As different studies provided references that NTI has a positive effect on organization performance hence we will accept H3 of the study.

CONCLUSION

This research was conducted to investigate the relationship between PI and NTI and their impact on the performance of the organization. The paper also tests the model empirically in order to capture these effects. Findings of this study strongly highlighted the importance of product innovation and NTI for organization performance. This study represents the theoretical and empirical research regarding link between PI and NTI in the manufacturing industry of Pakistan. Both PI and NTI have a positive effect on the performance of the organization. Regression was used to investigate the relationship between these two variables. The findings have indicated that PI and non-technical are able to boost up the performance any other organization also. There have been very few empirical researches on organizational commitment in the manufacturing industry. Certainly, this study has also contributed to the growing body of research on Innovation in a developing country like Pakistan. It is believed that this study will add value to the literature for the manufacturing organization of Pakistan since we have limited literature and other resources in Pakistan.

RECOMMENDATION

The data was collected and tested for the small and medium size organization of the industry so, this model is not applicable for the large organization in the sector. Pakistan is a developing country, organization are not so developed that they are following all the factors of high organization performance so these findings may vary from industry to industry because there may be chance that in some industries only PI has importance and vise versa. Results of the research from developed countries may vary from these results. Future research could be conducted to analyze the impact on NTI on process innovation. Further research also can be conducted on the impact of NTI on organization performance.

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