

IMPACT OF INNOVATIONS ON CONSUMERS' BEHAVIOUR: A CASE STUDY OF PAK ELECTRON LIMITED.

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ABSTRACT: *Innovations play a key role in changing behavior, purchasing habits and improving living standard of customers. In this era of stiff competition, innovation is the only toil through which business firms do not only fight a war of survival but also obtain competitive advantage. This is the reason that business firms particularly high-tech companies spend billions of dollars every years on research and development (R&D) and development of new products and services keeping in view the changing needs and demand of the customers. The objective of this study is to investigate how innovation affects the behavior of customers and which factors motivate the customers to adapt innovation. Main research question of this study is to measure the impact of innovation on consumer behavior with special reference to electronic industry. We have taken Pak Electron Company Ltd, which is a market leader in Pakistan and manufacturing different electronic products and marketing them since 1956. In order to measure the behavior of consumer towards innovation products we have taken a sample of 200 male & female customers between the ages of 18-65 years. The data which was primary in nature, was collected through field survey and a questionnaire was structured for this purpose. Face to face interviews were conducted. A standard likert scale was used to analyze data. This scale is commonly used for analysis in qualitative studies. S-Curve model was used to measure the innovations made or introduced by Pak Electronics Ltd in collaboration with other leading electronic companies of the world. Our study evidence prove that the effect of innovations are significant on the behavior of customers and 75% of respondents endorsed that innovative electronic products attracted and have brought positive change in their behavior and living standards.*

KEYWORDS: Innovation, S-curve, Customer behavior, purchasing intention, R&D

WHAT IS INNOVATION?

The word innovation is derived from Latin word “nova” meaning new. However, merely being new does not quite catch the essence of innovation. An innovation is also normally something that is novel and different. Just how different varies normally but typically most innovations have a degree of novelty. This newness and novelty is captured in most definitions of innovations: Rogers (1995) defines that an innovation is an idea practice or object that is perceived new by an individual or other unit of adoption. Betje (1998) states that “innovations are new things applied in business of producing, distributing and consuming products or services.” DTI (2004) says that “innovation is the successful exploitation of ideas.” Freeman and Soete (1997) define the innovation as “first commercial application or production of a new process or product.”

These definitions are more effective because they are related to business and commerce. They highlight the fact that innovation is about commercial explanation and application of ideas and innovations so that they can be traded in marketplace. Hence innovations embrace both technological and creative dimension.

Main Research Question

The main research question of this paper is to measure the impact of innovations on consumers’ behavior. We will investigate how innovations change the purchasing behavior of customers and why do consumers purchase innovative products?

Objective of the Study

The objective of this paper are given below:-

1. To study whether the companies make innovations and introduce new products when their existing products are selling in the market?
2. To investigate whether the consumers prefer to purchase new products?
3. To probe whether innovations improve the living standards of people.
4. To explore whether innovations help companies to sustain their competitive advantage.

Scope of study

The scope of study is wide because millions of companies are working day and night and spending billions of dollars all over the world to develop and introduce new products to meet the growing needs of the customers. As the needs, habits, income and desires of the customers are changing and the business firms will have to change their products, their marketing strategies and products range to survive in the changing business environment. This study is directly related to the innovations and their impact on customers and as such its practical implication is definitely more useful for business organizations and business researchers.

RESEARCH METHODOLOGY

Research methodology is a procedure which is used to conduct research. It facilitates the researchers to use set qualitative and quantitative tools to obtain the objectives and draw the desired results.

Data and Type

In this paper we have used both primary and secondary data. We applied survey method and collected primary data through a structure questionnaire. We extracted secondary data from the annual reports of Pakistan Electron Company Ltd.

Sample of Research

Electronic industry is growing in Pakistan as in all over the world. Almost all major world renowned electronic companies are doing business here and selling products through their sale outlets. Pakistan Electron Company Ltd is an old electronic Pakistani company operating here since 1956. It has variety of products and enjoying competitive advantage over its competitors. Due this reason we have selected this company as a case study to measure the volume of its innovations and its impact on its customer's vis-à-vis its competitors. We have selected 200 customers of different age and education to record their views about innovations and their impact.

Estimation Technique

As this is a case study and qualitative research we have used likert scale and statistical tables and charts to analyze the data.

Technology S-Curve model:

One of the most frequently sited models of technological progress is the 'technology s-curve' developed in the early 1980s by Richard Foster, of Mckinsey-the US management consulting the firm. The technology S-curve represents the typical trajectory of the improvement in the technical performance of the technology relation to the cumulative R&D effort. It is an inductively derived model of technological progress. The term, 'S-curve' was coined from the resulting shape of the curve when plotted, as illustrated in figure below.

Figure 1 R&D Expenditures and technology performance



effort'. There are two common proxies that are employed for representing R&D effort: R&D expenditure and R&D man years.

During the maturity stage, the yield on the R&D effort begins to decline at an increasing rate as it approaches the 'Natural' or 'technical' limits of the technology; this is represented by the shallow slope at the top of the S-Curve. An important element of the S-curve model is the notion of a 'technical limit' beyond which the performance of a technology cannot be improved irrespective of the R&D effort employed. A 'technical' limit' is a physical constraint is set by the laws of nature, such as the number of the transistors that can be placed on a square centimeter of silicon, which is limited by the crystal structure of silicon. Another key aspects of S-curve model is the concept of the 'technical potential' of a technology. This is the gap between the current state of the art of a technology and its technical limit. The technical potential is the gap between the current position on the s-curve for a given technology and the top of the s-curve.

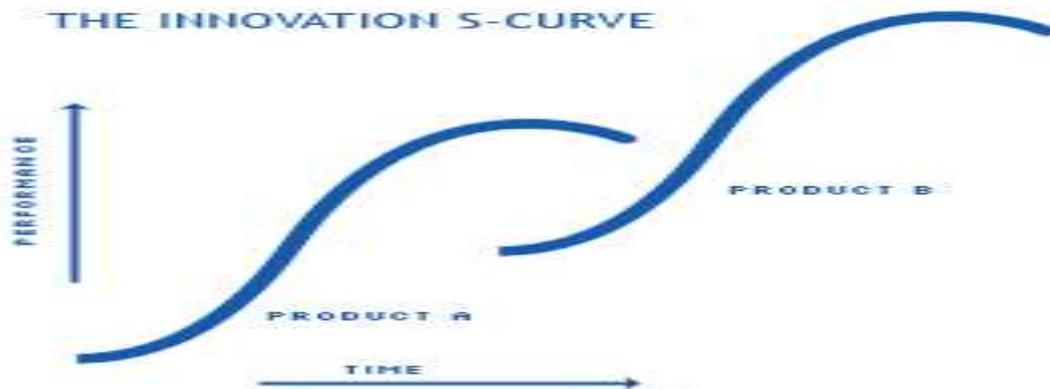
Explanation of the Model

The model indicates that the early stages of the development of a technology require a great deal of R&D effort simply to establish the basic knowledge and expertise to make subsequent progress, that is, in the emergent phase of technology, R&D effort may yield very little tangible progress in improving the performance of technology. Thus patience is required, because this 'ground work' is vital if the organization is able to move on the growth stage of the technology, at which R&D effort will begin to yield rapidly increasing returns. Consider the extraordinary coordinated R&D effort of laboratories around the world in developing human genetic structure through the "genome" project-a necessary precursor to the growth stage of the s-curve for the development of human gene therapies.

Example of Technical Limits

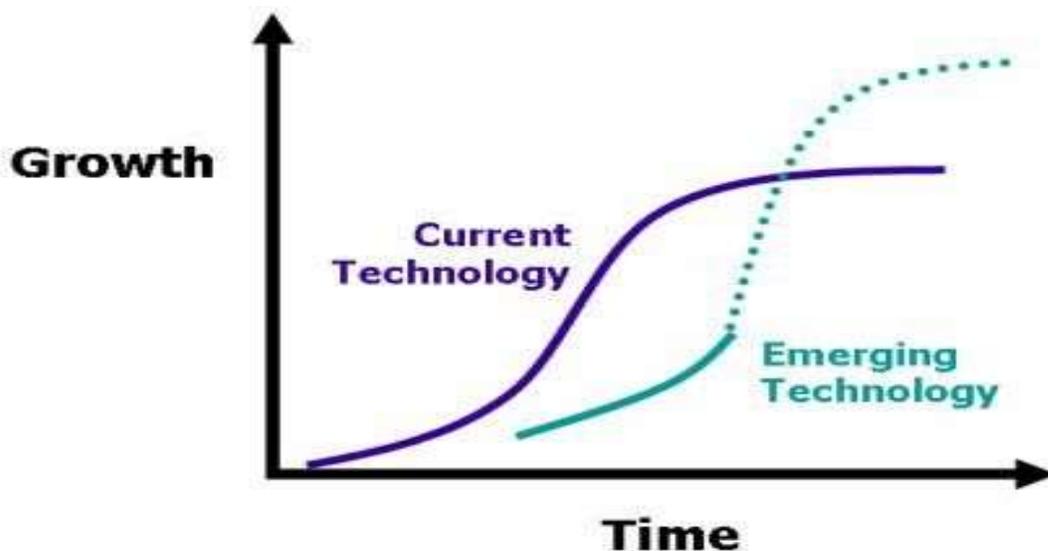
The model also highlights the importance of determining the technical limits and thus the technical potential of a technology. Innovative organizations therefore need to invest in understanding the scientific basis of phenomena and materials behind the technology. The development of Rayon is the best example. The first synthetic automobile type cord. To illustrate the importance of determining technical limits in advance: of the US\$ 100 million invested in developing rayon, the first \$60 million brought 800 percent improvement in technical performance of the material as the technology moved towards maturity and ultimately towards its technical limits the subsequent \$15 million investment in R&D resulted in only 5 percent. If the organization developing rayon known the technical limits, then their R&D investment strategies might have been very different. The Figure 2 shows two products: A and B. When a company foresees that its product A is moving to its technical limit it introduces B product in the market to ensure continuity of its business and survival in the market (See Figure 2).

Figure 2 Technical limit of product A and introduction of product B



The same fact is highlighted in the Figure 3 which shows (in the left) the state of current technology while (in the right) new technology is emerging to replace the old one. The business firm, which are vigilant and watch the changing business environment start working to develop new product before the obsolescence of old product. They deemed necessary to maintain their competitive edge. For this purpose they continue to spend hundreds of billions of dollars on research and development (R&D) every year.

Figure 3 Existing and emerging technology



Pak Electron and its innovative business strategy

Pak Electron Limited (PEL) is the pioneer manufacturer of electrical goods and appliances in Pakistan. It is a highly innovative, customer driven, leading Engineering organization of Pakistan involved in the manufacturing of Power & Distribution Transformers, Medium and Low Voltage Switchgears and construction of High Voltage & EHV Substations as well as a wide range of Domestic Appliances with in-house design and development facilities in the Appliances Division. Since its inception, the company has always been contributing towards the advancement and development of the engineering sector in Pakistan by introducing a range of quality electrical equipment's and home appliances and by producing hundreds of engineers, skilled workers and technicians through its apprenticeship schemes and training programs.

Innovation in PEL

PEL's focus is on developing up the abilities in item technological innovation, design advancement, obtaining know-how, providing functional and cost effectiveness and upgrading a reliable understanding and developing up our certification, social media and developing consortia with international technology management. The goal is to prepare ourselves in the stage being set where massive investment strategies have to be made in developing power generation, transmitting and submission systems regionally as well as in other regional areas. Their product mix is most powerful than ever, the advancement direction is growing and the brand is successful at the various places.

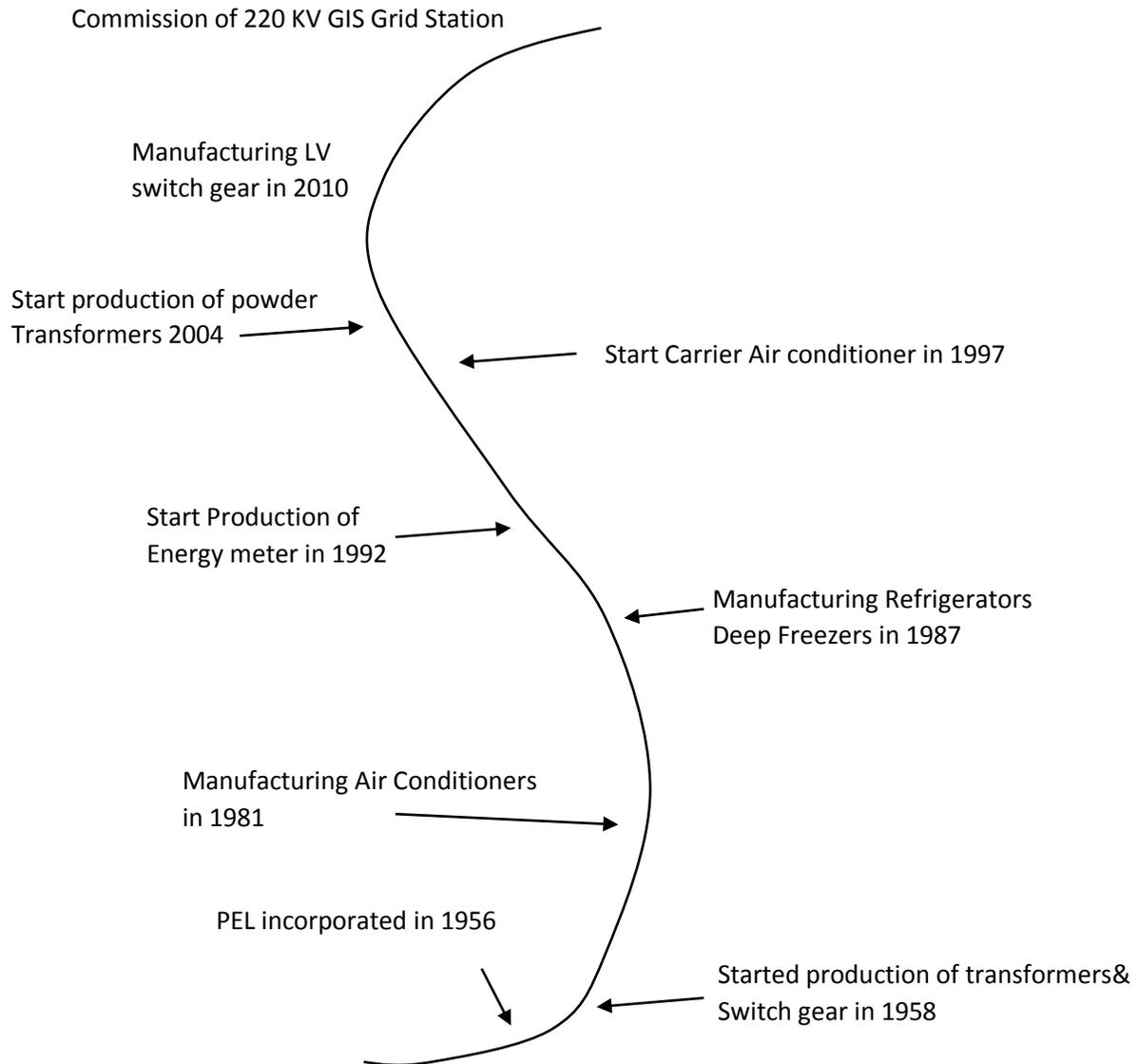
1. Pak Electron Ltd was incorporated in 1956 in Pakistan in 1958 it started commercial production and distribution of electric transformers and switch gears.
- 2 in 1981 it started manufacturing of air conditioner.
3. In 1987 it initiated the production of refrigerators & Deep Freezers.
4. It acquired License to manufacture VCBs from Hitachi Japan.
5. In 1992 PEL had taken initiative to manufacture electric meters.
6. In 1997 it acquired technology form carrier, US to manufacture air Conditioners.
7. In 2004 it started production of power transformers.
8. It set up a separate production line for production and distribution of transformers.
9. In 2009 it started export of power transformers.
10. In 2010 it initiated the manufacturing of LV switch Gears.
11. In 2010 it Prequalified with Saudi Electrical Co.
12. In 2013 it successfully started commissioning of 220KV 618 Shalimar grid station

Application of S-Curve Model on PEL

If we apply typical S-curve model we find that Pakistan Electron Ltd.'s competitive advantage and its growth in volume of sales and profitability is due to its continuous introduction of new and innovative products in Pakistani market. It has not only develop new indigenous products but also collaborated with world renowned electronic companies like Samsung, LG, Sonny, Seimen, etc and in this way induct new technology in the company's production line and to widen range of its products. It has enabled Pak Electron to not only compete with its competitors but also maintain

its leading position in the market. PEL's collaborative strategy is very successful because it has lessened competition with international electronic companies and enabled to launch latest high-tech electronic products. It saved its cost on research and development (R&D) as well as introduction of new brands. It seems very easy for it to sell renowned brand through its established sales outlets. Similarly, it has also benefited foreign companies to save money which is needed to be spent on the development of market by opening sales outlets in major cities. It has reduced their risk of loss because they are enjoying an established sale network of Pakistan Electron Limited. They need not to spend money on the advertisement or publicity of their products in Pakistani market. They are selling their products in a big customer market which is expanding rapidly due to increase in the income of people. In this market, the customers prefer to purchase best quality and renowned brands to upgrade their living standards. Figure 4 on next page shows how S-Curve denotes the innovations of PEL and its impact on its business growth and sustainability in the market.

Figure 4 : S-Curve and PEL innovative



Note: The author has drawn this diagram by extracting data from the annual report of Pakistan Electron Ltd, 2013.

Financial performance

The impact of innovations of any organization can be measured in its financial performance. We have used ratio analysis to measure the financial performance of Pak Electron Limited. Table 1 shows assets, gross sales, gross profits, share capital, shareholders equity and net profit of the company during the period 2008-2013 which shows all around improvement and growth.

Table :1 PEL's innovations and impact on its business performance (in Rs. Millions).

	2008	2013	Percentage
Total Assets	16,293,	27,143	60.02%
Gross Sales	13,927	20,294	68.60%
Gross Profit	2,837	40,055	69.87%
Share Capital	970	2,681	361%
Shareholder Equity	3,677	6,545	77.98%
Net Profit	452	607	34.29%

Source: Financial Statement of PEL, 2013.

The Data given in the above table show substantial impact of innovations on its business performance. For example, total assets of the company were increased from Rs. 16.29 billion in 2008 to Rs. 27.14 billion, an increase of about 60% during a short period of 5 years, 2008-2013. Gross sales were increased from Rs. 13.92 billion to Rs. 20.29 billion, and increase of around 68% while gross profit was jumped from Rs. 2.83 billion to Rs. 4.05 billion, an increase of 69.87%. the share capital of the company was short up from Rs. 0.97 billion to Rs. 2.68 billion, and exorbitant increase of 361%. The shareholders equity was increase by 77.98% from Rs. 3.6 billion to Rs. 6.5 billion. Net profit was scaled up from Rs. 452 million to Rs. 607 million, an increase of 34.29% during the study period of 2008-2013. The Figure 5 show tremendous all growth in the financial indicators of PEL Appliances due to continuance innovations in its product lines.

Figure 5 Annual gross sales of appliances (in Pak Rupee)



Exhibit 1: Performance of PEL

Figure 5 shows that Annual Performance of the PEL, that since 2006 to 2010 the sale was increasing at a higher rate. There was a decline in 2011 but again rising trend has been in 2012. So the innovation is supported by the consumer behavior of purchasing the items as they are according to their need and fulfilling the demand.

Figure 6 Market share of PEL



Exhibit 2: Market Share Analysis

As far as Market Share is concerned (Figure 6) PEL has a constantly rising market share due to the continuous development of the innovative products. When the products are developed or reformed then the consumer behavior towards the products as well as the company is positive.

Figure 7 Comparison of market share of PEL and its competitors

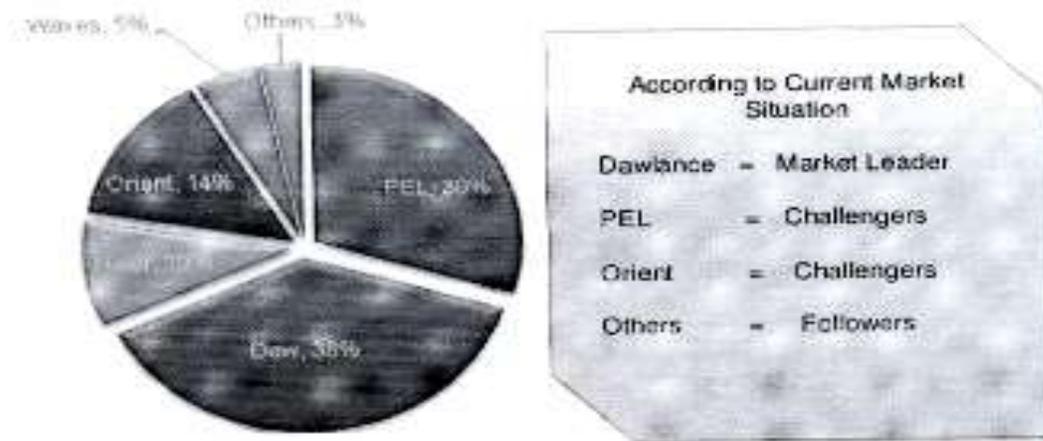


Exhibit 3: Market Situation

Data analysis

Profile of the Respondents:

Personal and demographic information such as gender, age, income, education and status is given in the Table 2.

Table 2: Gender

Male	83
Female	67
Total	150

Table 2 describes that out of our 150 respondents, 83 were Male respondents whereas the remaining 67 respondents were female.

Table 3: Age of Respondents

Age segment	frequency
18-25 Years	8
26-35 Years	20
36-45 Years	55
46-55 Years	39
56 & above	28
Total	150

Table 3 shows that there were 05 groups of respondents according to their age. In the 1st age group of 18-25 years, 8 respondents gave their response. In the 2nd group of 26-35 years, 20 respondents. In the 3rd group from 36-45 years, 55 respondents, in 4th group of 46-55 years 39 respondents and in the last group of 56 & above age, 28 respondents gave their feedback.

Table 4: Income of Respondents

Income Level	frequency
Below 25000	15
25001-35000	29
35001-45000	16
45001-55000	26
55001 & above	64

Table 4 shows the income of the respondents. The respondents whose income was below Rs.25000 were 15, whose income was between Rs.25001-Rs35000 were 29, whose income was between Rs.35001-Rs.45000 were 16, whose income was between Rs.45001-Rs.55000 were 26 and whose income was Rs.55001 & above were 64.

Table 5: Education Level of Respondents

Education Level	frequency
Under Matric	05
Matriculation	31
Bachelor	54
Master	43
M.Phil / PhD	17

Table 5 shows the Education Level of the respondents. 05 respondents were under-matric, 31 respondents having education Matriculation, 54 respondents were Bachelor degree holder, 43 respondents having Master education whereas the 17 respondents were M.Phil/PhD.

FINDINGS AND RESULTS

PEL is the leading player in domestic home appliance market. Over the past five years the company has made impressive progress in increasing market share and product range through exciting media campaigns, product innovation and strong distribution channels. Riding the wave of innovation, PEL has developed a range that made it possible to equip a home with very latest products which are technologically superior and economically affordable. Keeping in view the changing lifestyle of consumers, it made various products and the result is customers have a positive attitude towards the company as well as the products.

This study has three major academic contributions. First, this study makes a new research framework of Consumer behavior by combining the two concepts relationship purchase intention and innovativeness. The second contribution is that when the consumers are forced in compromising on product's features and product's quality, they are not ready to sacrifice their needs and requirement for the sake of quantity. This study develops a research framework that explain this issue by studying the different concepts, the product reliability, product perceived value and purchase intention. Third, this study explains the research of Perceived value and purchase intention in the context of consumer behavior.

The results showed that most of the males prefer counterfeit products to purchase. They are more willing to go for such products. More than 150 people of selected population were of the same choice that simply innovativeness impacts their intention to purchase the counterfeit products. Consumer is more involved in purchasing those products that have high perceived value. If consumer has the choice about the product that which type of product will he prefer than it is more and often observed that their behavior shows that they will go for counterfeit products. Most of the consumers are interested in purchasing new products just because they like innovation in the products. People chose to purchase innovative products because they get bored from the same product having same features all the time. There is also trend growing in the consumers about online shopping. Now it is more easy to get more innovative product from anywhere in the world in a minimum time period. This trend has impact the purchase intention of the consumer. in simple words we can mention that most of the consumer in this era go for the innovative product regardless which of their gender and status.

CONCLUSIONS

Our study shows that innovations bring major changes in the purchasing behavior of consumers. The consumers have natural tendency to purchase new products to improve their living standard. Our data prove that 68 percent respondents prefer new products for their homes and only 12 percent disagree with the question of new products for their homes, around 61 percent respondents stated

that they prefer to purchase new products soon after its innovation. The data of Pak Electron shows that its sale, net profit and total assets were increased 68, 60 % , 34, 29 % and 60, 02 % respectively during the study period, 2008-2013 due to innovative strategy and continuously launching innovative products in the market. The company maintained its competitive advantage through products innovations. Thus, our study proves that innovation play a key role in changing consumer behavior and growth of business of the innovative firms.

RECOMMENDATIONS

It is important to note that due to limited resources, the current study is confined to three cities of Pakistan and it could not be the representative of the all citizens of Pakistan. Present study includes the small sample size; the follow up researches may increase the sample size and can collect the data from various major cities of Pakistan like Karachi and Islamabad. Convenient sampling is used and the respondent are all from the specific area i.e. Lahore, Multan and Bahawalpur. As such result may not represent the intention of whole country, it can limit the potential of the conclusions.

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