CHAPTER-2
LITERATURE REVIEW

2.1 Background of the Study

This chapter describes about the meaning and definition of product innovation, need for product innovation. A portion of the division determines on the determinants of product innovation. Later on, this chapter focuses about the need for product innovation and issues linked with the product innovation. Consequently, the abstract framework of the product innovation is considered. Later division considers about the communications amongst innovation forms and its impact on the organizations performance levels. Additionally, this chapter also focuses on the impact of product innovation on the financial performance of the organization. Finally it summarized with the chapter conclusion.

2.2 Meaning and definition of Product Innovation

To go into new-fangled markets, to improve the existing market share and to develop the cut-throat frame of the organization, Innovation is one of the primary tools for strategic growth (Berry, et al., 2010) (Birkinshaw, et al., 2008) (Busenitz, 1999). Organizations are now realising the essence of innovation in their day-to-day working as new and modern technology is adapted by competitors very quickly at world-level, thereby it wear down the worth of old products and services (Brown & Dant, 2014) (Adams & Jeanrenaud, 2008). Therefore, tough competitive edge gives the encouragement to organisations across the globe to learn the concept and application of innovation.

Therefore, innovation becomes an important element of marketing strategies for organizations for many reasons such as to improve manufacturing processes that produce maximum output at minimum costs, to perform well-built in comparison to opponents in the market place, to improve the goodwill of the organizations in the mindset of the

* Part of this chapter has been published as:
customers (Coombes & Nicholson, 2013) (Buijs, 1993) (Hamel, 1998) (Hamel, 2006) and in nutshell, to gain long-term survival in a aggressive world (Cronholm, et al., 2013) (Andrews, et al., 2007) (Hamel, 2007). Over the past twenty years, innovation has gained popularity amongst the researchers who tried to characterize the impact of innovation on performance levels as this subject is very practical in nature (Dholakia, et al., 2010) (Amabile, et al., 1996) (Burns & Stalker, 1961). Innovation provides the platform to organisations to survive in long-term in the competitive planet with sufficient profit earning capacity. It is a tool that provides strategiesto fight with competitors (Ericsson & Sundstrom, 2012) (e.g. Drucker, 1985; Hitt et al., 2001; Kuratko et al., 2005, Hauser et al., 2006) (Drucker, 2012) (Drucker, 1985a).

The scope of innovation is limited not only to products and its process of production but is also extended to marketing strategies and organization environment. Schumpeter (1934) (Capon, et al., 1992) (Goldkuhl & Cronholm, 2010) described various forms of innovation: new goods & services, latest processes, new manufacturing ways, new marketing strategies, new techniques of packaging and delivery of products and services and better options to manage the business. Drucker (1985) (Hervas-Oliver, et al., 2014) defined innovation as the course of preparing improved techniques, new technology and methods and increased uses of products and services. Innovation is intently connected to managerial understanding. Thompson (Thompson VA, 1965) (Hermann, et al., 2006) (Matzler, et al., 2013) describe innovation as the creation, recognition, and execution of new-fangled proposal, methods, manufactured goods, or services. According to Zaltman et al. (Zaltman G, Duncan R, Holbek J., 1973, (Calantone, et al., 2002) and (Rogers., 1983, 1995) (McGrath, 2011), it is an thought, exercise, or objects seeming as new by the ultimate users. Amabile et al. (Amabile TM, Conti R, Coon H, Lazenby J, Herron M., 1996; Lhuillery, S., 2014) define innovation as the flourishing use of Novel thoughts inside the organization (Hurley RF, Hult GTM, J., 1998; Baker, W. E. and Sinkula, J. M.,2009) (Metka & Galouj, 2012). The process of innovation includes the innovation process involves the possession, spreading, and application of new information (Damanpour F., 1991; Johnson JD, Meyer ME, Berkowitz JM, Ethington CT, Miller VD, 1997; Moorman C, Miner AS, 1998; Verona G., 1999, Amabile et al., 1996) (Burgelman, 1983a) (Rindell, et al., 2011). There seems to be extensive harmony that knowledge
environment and innovation within the firm are closely related to each other and many authors have described over this to check that how they are related to each other (Hurley RF, Hult GTM., 1998; Damanpour F., 1991; Goes JB, Park SH, 1997; Sinkula JM, Baker WE, Noordewier TA, 1997) (Sorescu, et al., 2011). Innovativeness is one of the elementary tool of organizations corporate strategies to improve the existing share of the market, to explore new market places, to gain brand image in the minds of the customers and to create long-run win-win situation (Baldwin & Johnson, 1996) (Sundstrom & Reynolds, 2014). In the past years, the essence of innovation is mainly taken up and it has become an main provider to success and profits of the firm since extra worth of existing products and services are falling as a result of replacement of old technologies with the new ones and world level competition exists (Teece, 2010). This concept has given more emphasis on improvement of old and new products and services for which innovations are highly focussed (Cooper, 1983) (Cooper, 1997) (Cooper, 2000) (Cooper & Kleinschmidt, 1987).

An innovation is written as an idea or product that is accepted as novel by an person or an group. “The apparent novelty of thought from the person;’s view point establish his or her response to it. If the idea is new for the person that he is experiencing for the first time, we called it as an innovation (Westerlund & Leminen, 2011) (Robertson and Tu, 2001). An innovation composed of much systematic facts about how the products or services performed than before. The importance of innovation in products and services and capacity of the organization to perform innovation function is a matter of concern for certain reasons. (Anthony, et al., 2007) (Battisti, et al., 2010). An improved products and services over the existing ones provides the firm opening in terms of improved goodwill, increased profits and growth as well as give opportunity to firms to gain advantage over its competitors (Zott, et al., 2011). Innovation is a concept of embryonic some code for overseeing new product development (Brown & Eisenhardt, 1995) (Cooper & Kleinschmidt, 1995) (Goodman, et al., 2013) because a product is very important as it is used by the ultimate customers who builds up the image of the organization (Hayes & Andrew, 2013) (Balbontin, et al., 2000). It can be called to as goods (physical, substantial products) or services (insubstantial products). New Product development is the group of actions starting with new opportunity that can be grabbed at market place and lasts with
manufacturing, packaging, sales, and delivery of the product (Ulrich and Eppinger, 2007) (Jhang, et al., 2012). Product development requires the togetherness of many experts from different areas in order to achieve qualitative and technical product (Chux Gervse Iwe, 2010) (Ma, et al., 2014). There are a numerous incredible studies that accentuate on the production of new products and their impact in terms of increased profits (Zirger et al., 1990; Drucker, 1997; ImS and Workman, 2004; Wei and Morgan, 2004; Yannele, 2005) (Markoff, 2010), Wheelwright and Clark (1992), (Noseworthy, et al., 2011) Page (1993) among others, they found a well-built sustain for the fundamental suggestion that product development and creative ideas affects the overall show of an business.

Below is the table 2.1 showing the definition of innovation contributed by researchers and table2.2 showing the examples of companies practicing innovation

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Definition</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovativeness</td>
<td>Innovativeness refers to: • Developing Novel ideas for product/service improvement, • Developing Novel ideas for market development, • Developing Novel ideas for process improvement.</td>
<td>Khandwalla (1974), Miller and Friesen (1982); Drucker (1985); Covin and Slevin (1986); Khandwalla (1987), Covin et al. (1990); Covin and Slevin (1991); Zahra (1993); Knight (1997); Hamel (1998); Hornsby et al. (2003); Khandwalla (2003), Kuratko et al. (2005), Hamel (2006)</td>
</tr>
</tbody>
</table>

Table 2.2: Examples of Companies Practicing Innovation

<table>
<thead>
<tr>
<th>Firms</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merck, Motorola, Nordstrom, 3M</td>
<td>Collins and Porras (1996)</td>
</tr>
<tr>
<td>Intel, Whirlpool, Gillette, Union Carbide</td>
<td>D’ Aveni (1994)</td>
</tr>
<tr>
<td>Nike, Johnson and Johnson, 3M, IBM, Hewlett-Packard, Polaroid, General Electric</td>
<td>Treacy and Wiersema (1993); Kuratko et al. (1993)</td>
</tr>
<tr>
<td>Sony, Sharp, Yamaha, Toshiba, Motorola, AT&amp;T, 3M, Citicorp, General Electric</td>
<td>Hamel and Prahlad (1991); Davis et al. (1991)</td>
</tr>
</tbody>
</table>

Source: Barret and Weinstein, 1998
Inbuilt in the above definitions of innovation is a component of newness. The issue that takes place is to know the amount of Novelty needed to call any revolution as innovation (Robinson, 1990). An explanation matter here is to differentiate innovation, the introduction of real newness to the market place, from replication, the acceptance of a innovative system or plan that is by now in the market. A product or process might be new to the firm, new to the home marketplace, or novel to the globe market (Hurt, et al., 1977) (IMS & Workman, 2004) (Iansiti & MacCormack, 1997). Evidently, the preceding of these, international uniqueness, is enough to meet the requirements of the product or process as an newness (Atuahene-Gima, 1996) (Drucker, 1985) (Roger, et al., 2002). For those goods and services that are not globally sold whether due to the character of the product, unreasonable convey charges, or curbs on deal—the investigation of being “novel to the home marketplace” is enough to create that there is an innovation element present within the nation. In our outlook, being “novel to the organization” is not sufficient examination for innovation, as the firm in issue may merely be accepting a merchandise plan, or a manufacture process, initiative by a opponent (Michael I, 2011) (Christensen, 1997) (Clark & Fujimoto, 1991) (Eisenhartdt & Tabrizi, 1995) (Fagerberg, et al., 2004). In this context we describe this as the diffusion of innovation. We describe an innovation as novel to the organization and novel to the significant marketplace (Rogerio, et al., 2007) (Ghariebeh, 2011). This appropriate marketplace is domestic or international is reliant on the merchandise or method in subject and the extent to which it is demanded in a ready for action worldwide or home surroundings.

An additional characteristic of two definitions of innovation is that the manufactured goods or method must be pioneered into the market so that customers or other firms can get advantage. This differentiates an innovation from an creation or sighting (Andrew, et al., 2009) (Rogers, 1995) (ALHussain, 2011). A discovery or findings boost the accumulation of information, but it does not right away reach your destination in the market place as a complete new product or process. Innovation takes place at the summit of taking to the industrial market new-fangled products and processes originated from uses of together old and new information (Chadha & Kapoor, 2010) (Rogers & Shoemaker, 1971). Therefore we can observe that
innovation takes place at the core of a multifaceted method, started by inventions and lasts by the extensive acceptance of the novel variety of products by consumers, or the agreement of most excellent exercise methods in the mainstream of organizations. We entitled this last phase diffusion, and it is obvious that the advantages of innovation to the nation and its general public are not entirely comprehend in anticipation of this has taken place (Chawla & Joshi, 2010). The learning of innovation barely needs explanation as researcher, strategy creators, trade management, and public superintendent uphold that innovation is a chief foundation of trade and industry growth, work transform, spirited lead, and community provision (Chadha & Kapoor, 2010) (Borins, 1998; Boyne et al., 2006; Christensen et al., 2004; Tidd et al., 2001) (Burgelman & Sayles, 1986) (Covin, et al., 1990) (Robertson & Tony, 2001). The approval of innovation is a way for managerial alteration and revolutionize to assist in attaining the firm’s routine targets, mainly beneath the circumstances of powerful rivalry, swiftly transforming marketplace, in short supply possessions, and buyers and community order for superior worth and improved products and services (Boyne et al., 2003; Jansen et al., 2006; Roberts and Amit, 2003) (Covin, et al., 2000) (Roozenburg & Eekels, 1995) (Dutta & Lanvin, n.d.). To aid sustainability and get better their concerts, association present novel products and services to existing or new clientele or consumers, and bring in innovations in the organization’s fabrication or functioning structure and white-collar or managerial procedure (Elena, 2013) (Camison-Zornoza et al., 2004; Edquist et al., 2001; Hipp et al., 2000). Firms largely systematize their innovation pains through R&D activities and has thus determined on a narrow classification of product and process innovations linked with the R&D task in mechanized business (Fries, et al., 2011) (Gallouj and Weinstein, 1997; Miles, 2001) (Rose, et al., 2009).

Innovation is the method that provides additional worth and newness to the business and its contractors and consumers through the maturity of latest actions, results, products and services as well as innovative ways of doing business (Bessant, 2003) (Bessant & Von Stamm, 2007) (Rosenbloom, 1974) (Gholami, et al., 2013). Inside this process the main functions of the business industrialist are to confront official procedure, to review novel chances, to bring into line and develop assets and to shift
the innovation process ahead. The commercial entrepreneur’s supervision of the innovation course will guide to larger profits for the business. Corporate entrepreneurship can be distinct as the attempt of encouraging innovation in undecided surroundings (Nguyen & Mohamed, 2011) (Barret & Weinstein, 1998) (Barringer & Bluedorn, 1999) (Covin & Morgan, 1999) (Covin & Slevin, 1991). Corporate entrepreneurship, also known as corporate endeavour, or intrapreneurship, has been commenced in conventional institute for intention of effectiveness (Zahra, 1991) (Duncan, et al., 1988) (Goes & Park, 1997), tactical revitalization (Birkinshaw, et al., 2005) (Guth and Ginsberg, 1990) nurturing innovativeness (Baden-Fuller, 1995), getting hold of information for prospect income flows (McGrath et al., 1994), and intercontinental accomplishment (Birkinshaw, 1997) (Bhardwaj, et al., 2007). Previous researchers have defined corporate entrepreneurship (Danisman & Erkocaoglan, 2007) (Borch, et al., 1999) (Dess & Lumpkin, 2005) as exemplified industrial hard work that need directorial approvals and supply pledges for the reason of continuing out innovative activities in the shape of product, process, and executive innovations (Miller and Friesen, 1982; Covin and Miles, 1999; Burgelman, 1984; Kanter, 1985; Alterowitz, 1988; Naman and Slevin, 1993; Zahra and Covin, 1995) (Battisti & Stoneman, 2010). According to (Damanpour, 1991) innovation would contain ‘...the formation, spreading out, and carrying out of novel ideas or thoughts. An innovation can be a new invention or facility, an organizational structure, or a novel arrangement or proposal related to managerial members.’ In this framework, corporate entrepreneurship (Omerzel, 2010) (Burgelman, 1983) (Hornsby, et al., 2002) (Hornsby, et al., 1993) a focussed on repeated efforts and improving the aptitude of a organization to grab innovative talents and potentials. Zahra and O’Neil (1998) (Gautam & Verma, 1997) (Ginsberg & Hay, 1994) indicate that the factors in the outer surroundings and the business arrangement, requires the management to react imaginatively and do something in novel ways.

Innovation is observed as the central aim of an organization’s scheme and a decisive aspect for it’s ready for action strong point and nonstop continuation. Firms increase modernism to settle in to their outside setting and to act in response to superficial amendments within or peripheral the organization. Innovations can be put into
practice in the organization’s results, it’s arrangement, and it’s courses in order to keep or to get better rank of show or success (Portera-Zanotti & Rinsche, 2010) (Damanpour, Gopalakrishnan 1999). Noteworthy innovations let firms to open leading spirited locations, and have enough money to open new-fangled entrant firms, an occasion to put on an border in the marketplace. A product innovation is the beginning of a good or service that is novel or considerably enhanced about its features or wished-for purposes; together with major improvements in scientific stipulations, workings and resources, including software, consumer easiness or other well-designed type (OECD Oslo Manual, 2005). Process innovation is defined as the execution of a novel or radically enhanced invention or delivery system. for instance, going to visit the doctor and copy that you have reached for your prior arrangement by moving a screen as a substitute of discussion to a receptionist. Note down that the product innovation and the process innovation are strongly associated to the theory of scientific expansions and generally referred to as the technological innovations in the literature (Schwab, 2013) (Baer & Frese, 2003). A marketing innovation is the execution of a novel marketing means connecting important modifying in product making or wrapping, product assignment, product advertising or value. At last, an organizational innovation is written as the execution of a novel managerial means in the firm’s trade practice, workplace organization or peripheral dealings. Some authors favour the term managerial innovation (F.Damanpour, 1987; C.Y., Y.Lin and M.Y. Chen, 2007).

Product innovation examples

Fabrication and Assembly Company (FAC) is an illustration of varied, opening growth of novel manufactured goods. It was set up in 1972, where it firstly started with the making of crossing walls dock. Then they realised that this was limited platform to begin with the new project. Later on, they strived interweave appliance parts and its covers, but they were also unbalanced promote. Improved outcomes were obtained with temperature switchers for the steel production; and in 1978 stream counter cutting beds were set up, by substantial succeeding growth. In 1987, FAC was initiated a original mechanism to take away rust dump from flame-cut steel, and
was considering the likelihood of creating a automated treatment arrangement for grave steel plates, with authorization from Finland.

*Farm Machinery Manufacturer (FMM)* constructed a flourishing big business on the foundation of one exceedingly pioneering plan. This was a farm animals nourishing arrangement in which a machine connected to the creature stimulates an automatically inhibited nourish distributor. This showed the way to a string of expansions with more and more classy selection. After this slender area of expertise led to severe marketplace hindrances in 1983, the corporation started to branch out, and urbanized a thriving implant nourishing arrangement. It also commenced to affect its know-how to others problems, for instance the creation of light-controlled ambler voyages for hindered individuals.

*Specialized Knitting Machines (SKM)* was based on particular equipment (knitting) but was using this to new-fangled or focused struggles. It recognized by purchasing the producing and allocation rights of a variety of piece of equipments from an US corporation. Consequently it has urbanized a supercomputer guarded pullover interweaving appliance, which to a great extent amplified the series of blueprints and ways which could be shaped. It also urbanized a mechanism for weaving threads of white meat composite into a constant substance, which requisite interweaving idea novel to the business.

*Incinerator Company (IC)* is an illustration of together designed and opening modernization. It started on as a dealer and service provider of made-up workings. More a time it examined the likelihood of getting in to the market for superior incinerators. On the other hand it was only when a client firm, which was fitting an incinerator, request it to take over the bond with which it was having practical problems that it was able to take out its sketch. The corporation consequently initiated a novel kind of incinerator contributing additional entire ignition and abridged smoulder release. This had become the major basis of the company’s enlargement and had legalized it to go into export marketplace.
2.3 Need for Product Innovation

Product innovation means dissimilar equipment to diverse group. It can be opening of a new product into a market place for the first time (Kanter, 1982) (Kanter, 2006 Nov). Few people regarded innovation as the upgradings in the old products (Andreasen & Hein, 1985). Although, changes in the products for betterment is taken as product innovation in many corporate houses. Product Innovation may be distinct as the expansion of novel goods, alterations in features of recognized goods, or make use of novel resources or mechanism in the production of recognized goods.

Figure 2.1 represents the product innovation in two categories of innovation:

For the business to exist in the aggressive market, it is relevant to pioneer new-fangled goods and services (Cahill, 1996). On the other hand, it is established that over 80 percent of novel goods be unsuccessful. Further, even thriving opening do not constantly results in top-level development.

In broader sense, Product innovation is the formation and succeeding opening of good or service that is either new or improved on previous goods or services. Product development and innovative steer offers big business facilitates surroundings to attain a superior point of performance and improved purchaser standards (Sivasubramanian & Mageswari, 2011) Liu et al. (2002) (DeBresson & Amesse, 1991) (Kanungo, 1998). Researchers have also found that executive knowledge is connected with progress of novel facts, which in turn is key for firm innovativeness and firm performance (Liu et al., 2002) (Damanpour, 1990) (Damanpour, 1991) (Damanpour & Evan, 1984). Important innovations permit firms to set up central ready for action positions, and pay for new comer firms a chance to increase a frame in the marketplace. Firm innovativeness composed of diverse proportions, product innovativeness scrutinized in the narrative both from customer’s viewpoint and firm’s standpoint; innovation in product process, business organization and human resource
Chapter 2: Literature Review

management practices (Khandwalla, 2006) (Khazanchi, et al., 2007). A product or a process direction of firm innovativeness will result in achievement if the firm carry out activities appreciated by the marketplace. According to Petrella (1996) (Damanpour & Gopalakrishnan, 1999) (Damanpour, et al., 1989) launching successful goods is very difficult. Many corporations are exceedingly flourishing many times and it’s a confront for NDP Managers. Some of the major challenges for managers are: transactions, day-to-day changes, particulars, point in time stress, and conception. Others include contentment of community and individual want, panel range and group motivation. Transactions deals with creation of selections connecting product requirement and the effect of outlay just about the alternative. Client preference, competition in the environment and know-how are all vibrant elements. These cause grim dare to a product development attempt (Dess, et al., 1997). Product development judgment must regularly be made rapidly taking into account the fact that merchandise are meant to please the needs of consumers. It is also important to know that where all, it is important to include product development, everyone should be on toes and teams should be self-motivated (Sethi, 2000) (Isaken & Dorval, 1993) (Iwe, 2010) (Jaruzelski & Dehoff, 2007).

The worldwide competition motivates the big houses to determine their efforts on their innovation strategies and it becomes more difficult to achieve this target afterwards 80s (Kuratko and Hodgetts, 1998) (Jassawalla & Shashittal, 2000) (Jaumotte & Pain, 2005). Now-a-days, both corporate houses and managers at individual level started to assess and use their expertise and business strategies to fight the cut-throat competition (Drucker, 1985; Hult et al., 2003) (Jenkins, et al., 1997) (Johannessen, et al., 2001) (Theriou, et al., 2010). Officially, innovation is measured as expansions and new uses, with the rationale of introduction novelty into the monetary area (Wee & Chua, 2013) (Li & Autagene-Gima, 2001). It can be visualized as the alteration of information for profit worth. Innovation has great business-related significance due to its chances for growing the competence and the productivity of companies (Baker & Sinkula, 2009) (Johne & Davies, 2000) (Lengnick-Hall, 1992). Actually, the primary motive for innovativeness is the wish of firms to get bigger trade show and augmented ready for action frame. Companies acquire extra aggressive gain and marketplace profit share as per the stage of significance they give to innovations, which are essential elements for companies to make a status in the open market and thus to boost their marketplace share. (Yajnik, 2013) (Leonard-Barton, 1995) Metcalfe (1998) assured that when the stream of novelty and innovation dry out, firms’ financial arrangement resolves down in
Chapter 2: Literature Review

an motionless condition with small enlargement. The impact of innovation on the performance levels can be seen in sales growth, change in market share, profit levels to output levels and competence (OECD Oslo Manual, 2005). McAdam and Keogh (2004) examined the correlation between firms’ concert and its awareness with modernism and further investigation. They established that the firms’ preference to innovations was of crucial importance in the aggressive atmosphere in order to get advanced reasonable improvement. Geroski (2005) observed the special effects of the chief innovations and copyrights to various business performance methods such as book-keeping, profit returns, stock prices and corporate expansions in terms of growth percentage. The examined straight effects of innovations on firm recital are moderately little, and the reimbursement from innovations are further likely not direct. However, innovative firms appear to be less vulnerable to recurring changes and ecological demands than other firms (Biemans, 1992) (Birkinshaw, et al., 2007).

Below is the figure 2.2 of strategies of product Innovation in connection to performance of the organization.

![Diagram of strategies of product Innovation in connection to performance of the organization](source)

Below figure shows the experimental knowledge that evaluates the profits from adopting new-fangled item for consumption strategies which was done in Canada and only with business firms. Other studies may be happening, but their results are not obtainable. Peak performance businesses have in place a product innovation and
technology plan motivated by the business headship players and a tactical idea of the business (Cooper R.G., Edgett, S.J. and Kleinschmidt, E.J., 2004).

2.3.1 Interactions among the Innovation Types (Alpkan, et al., 2010)

It is clear that firms have diverse stages of innovative talents; nevertheless innovative actions have to be determined on numerous features concurrently such as novel products, novel organizational and marketing customs or managerial systems, and novel process expertise (Baxter, et al., 2014) (Drejer, 2002; Garcia and Calantone, 2002; Johannessen et al., 2001; Lin and Chen, 2007) (McAdam & Keogh, 2004) (McKinsey, 2008). Furthermore, as Damanpour and Evan (1984) stated a reasonable pace of agreement of managerial and scientific innovations are extra useful in helping firms to safeguard and get better growth rates than using them individually (Dyer & Furr, 2014) (Sakkab, 2007) (Saleh & Wang, 1993). Even though innovation narrative does not signify results whether a definite innovation style is probable to give the effect on financial performance in positive or negative side, it can be concluded that innovations links with each other and require to be put into practice in concurrence (Walker, 2004) (Mairesse & Mohnen, 2010) (Marcus, 1988). Results in the past study entail that organizational (re)structuring turning to administrative and constitution revitalization or upgrading which is a catalyst for the other kinds of innovations. For example, Damanpour et al. (1989) concludes that directorial innovations led to scientific innovations in open libraries. Likewise, (Goffin, et al., 2012) Staropoli (1998) (Archer, 1971) highlighted the significance of supportive managerial rescheduling and harmonization apparatus to improve technical innovations in the pharmaceutical business, while Germain’s learning (1999) shown that managerial arrangement description might be important analysts of process innovations in the logistics sector. Further in recent times and particularly, Walker (2008) (Mol & Birkenshaw, 2006) (Mone, et al., 1998) declared that managerial, advertising and facility (or product) innovations were found to be interconnected in knowledge on communal organizations.
2.4 Conceptual Model/ Theoretical Framework of Product Innovation

The theoretical foundation for a replica that includes these common associations among innovation, cutthroat strategy and situation of process development evolves in the amalgamation of two different but at the same time complementary lines of examination that have been followed separately by the current researchers. The relationship between a organization’s surroundings and its innovation goals such as performance maximizing, sales maximizing, or cost maximizing is one aspect that is questioned (Meyer, et al., 2010) (Utterback JM 1974, 1975) (Miller & Friesen, 1982) (Milling, 1996). The relationship between the firm’s growth process and innovation types such as the type, source and stimuli of innovation is another aspect to be considered (Abernathy & Townseed, 1975) (Abernathy & Utterback, June/July 1978). The above two aspects are combined in to one aspect and took the form of model named as innovation to product and process evolution. A meticulous knowledge of the model and it’s changing nature is necessary to reach to an efficient and competent organization of the whole innovation course. A complete and informal move towards the model structure is necessary to describe and to assist to know that why detailed performance takes place (Milling 1996) (Geroski, 1995) (Gunday, et al., 2013) (Hagedoorn & Cloo, 2003).

2.4.1 Early Model of the Product Innovation Process by Delft Design School.

Modeling innovation processes had become an accepted scholarly regulation. In the Conference on research design methods in UK, evolution of product innovation processes came up (Gregory, 1966; Jones 1970) (Schaltegger & Wagner, 2011). That conference discussion motivated the heads of Delft Design School that the main course was based on research methods and models that becomes the part of the discussion. (Wilde, 1997) (Saren, 1984).

The commencement of the product plan process was generally seen as a product proposal, chased by a phase in which this idea was scrutinized and developed into a product model. In the subsequently step this idea was developed and turned up into a working mold or sample. This example was then engineered for production and finally the new product was introduced on the market place (Schmidt & Rammer, 2007)
Chapter 2: Literature Review

(Schroeder & Robinson, 2004). The step consists of R&D department, design department, engineering department, production department, and finally marketing department under a department-based division. The steps consists of idea generation, idea screening, commercial evaluation, technical development, testing and commercialisation using an activity-based division (See below Figure 4)

![Diagram of the Product Innovation Process]

Source: Saren, 1984

Figure 2.3: Two Early Models of the Product Innovation Process. Above is the Department-Based View, and below, the Activity-Based View

2.4.2 Model of Process Development

The fundamental plan underlying the projected representation of process development is that as a manufacture process expands over a period to increase the output levels, it does so with a attribute growing trend i.e. it becomes more money demanding, direct work output gets better through specialized way of labor division, the course of materials in the process takes on added of a straight row course excellence (that is flows are efficient), the product plan becomes more consistent and the process level becomes bigger. As a process carry on to extend for advanced output through marginal deviations in these elements, a total impact is attained that considerably changes the entire process. The trend of variations are at all levels, from one level to a second, going ahead of the materialistic features to the efficiency factors. Three
diverse phases of process development which are named as - Uncoordinated, segmental and systemic.

- **Uncoordinated**: In this phase, the process is flowing, with movable and disconcerted relations between process essentials. Such a method is unrefined and adapts quickly to ecological variations but necessarily has sagging and is incompetent (Burns and Stalker 1961).

- **Segmental**: Production systems, designed more and more for competence, becomes technical and inflexible. Actions become more particular and leads to more strict working controls. In stipulations of process, the production structure has a propensity to become complicated and tightly through mechanization and process management. Hence, production processes in this phase will have a segmented excellence.

- **Systemic**: As a process becomes extremely developed and incorporated and as outlay in it becomes hefty, choosy development of process elements becomes gradually much more complex. The process becomes so well incorporated that variations become very expensive, because even a little change may require variations in other essentials of the process and in the product design. Process redesign usually comes more gradually at this phase, but it may be encouraged either by the improvement of new expertise or a by a unexpected or collective move in the necessities of the marketplace.

The vital design is that a process or industrious sector tends to develop and revolutionize over time in a steady and particular way (Abernathy and Townsend 1975). It demonstrates that process development is related to process innovation.

### 2.4.3 Model of Product Development

A product innovation is a novel skill or combinations of tools started marketable to meet a consumer or a marketplace want. The essential thought behind the projected replica is that products will be launched over period in a expected way with preliminary focus on product concert, then focus on product assortment and thereafter focused on product consistency and expenditure (Azaze & Evelyn, 2010). Therefore,
a firm at one point may try to be the initial to bring in strictly superior products (performance-maximizing), or to check others innovate but be ready to rapidly settle in and set up new-fangled product changes and characteristics (sales-maximizing), or to move into the marketplace afterward in the product life phases with simplified and less costly adaptations (cost-minimizing) (Ansoff H and Stewart JM, 1967; Simmonds WHC, 1973). Therefore, there subsists the association between product and process innovation and also product development is related to product innovation.

- **Performance-maximizing:** A greater part of innovations shaped by performance-maximizing organizations would be predicted to be market motivated with a important scale of ambiguity about their final marketplace likelihood. Innovation may repeatedly occur from unanticipated basis or instructions of query. These firms would be likely to depend mostly on peripheral basis of knowledge, and on more different basis of knowledge than would others. Product innovation is likely to be determined or inspired by novel marketplace wants and occasions. The dangerous imminent for innovation is frequently attained by recognizing the skill. The success for innovation is in the person or association that is closely well-known with desires. Scientific innovations which may have marketplace function lie down empty until marketplace can be known or formed (Assis, 2003) (Bao & Yang, 2004).

- **Sales-maximizing:** These firms would have a tendency to describe wants based on their image to their clients. Innovations that lead to enhanced product show might be predicted to be less expected, unless performance upgrading is simple for the purchaser to assess and evaluate. The lessening in market want vagueness, with better dissemination of product utilization enables improved use of highly developed expertise as a basis of supplementary product innovation. The outcome will more often be product deviation, or novel mechanism. This phase of product innovation approximately match up to the segmental phase of process evolution. Process variations will mainly be enthused by the requirement for higher productivity and these may become not a continuous process innovations that include novel techniques of firm and product styles as well as manufacturing methods.
Cost-minimizing: As the product life cycle develops, product choices tend to be decreased and the product becomes uniform and basic for all users. Then as a succession, the foundation of rivalry commences to move to cost of the product where profit margins falls down, the firm started to have the characteristics of oligopoly industry and therefore, effectiveness and more output at lower cost is the main aim of the firm. In the cost-minimizing phase, important improvements often take place that includes variations in the design of product and process and must be integrated with the structure as a whole (Schubert, 2010) (Seebode, 2011). Because outlay in process tools in place is far above the ground and product and process alterations are mutually dependent, innovations in both product and process may be likely to be chiefly marginal. Innovations will classically be urbanized by tools contractor for whom the encouragement are relatively larger and accepted by bigger consumer organization (Freeman C, 1968) (Jin, et al., 2004) (Jansen, et al., 2006).

2.4.4 Innovation and stage of product development

The blueprint of associations between a segment’s phase of development and innovation can be seen in the below figure 2.4.

![Three Stages of Innovation Diagram](image)

Source: James Utterback, 1975, Mastering the Dynamics of Innovation

**Figure 2.4 shows the segment’s stage of development and Innovation**
Variations in occurrence of innovation are shown on the vertical axis and related to the phase of the product and process development on the horizontal axis. This replica shows an arranged and still succession of product and process growth, consistency and enhancement in sales amount. Process segments which reveal the main charge of development in output do certainly appear to develop through the phases pointed. But this is not essentially the instance for all process segments (Abernathy WJ and Townsend PL, 1975) (Johnson, et al., 1997).

There is a motive to consider that in several cases the succession may discontinue for extended time, or even turn around. An organization which does track the development of process segment to the last extent may realize that they have attained the advantages of higher output at lower costs along with reduced flexibility and modernism. It must expect fight from pioneering products that are shaped by other more supple divisions that are more competent of alternate products, overseas trade in, rival goods from other industries having demand with the feature of soaring cross-elasticity, or process variations by consumers to eradicate the product openly (Abernathy WJ and Wayne K, 1974).

Numerous significant issues in running technological innovation are tackled by the model (Czepiel, 1975) (Damanpour, 1987) (Dougherty & Hardy, 1996) (Doganova & Eyquem-Renault, 2009):

1. The success of innovation moves with the phases of development:- In the unconnected stage in the growth of a process, innovative imminent comes from those persons or firms that are very well known with the beneficiary practice, instead of those closely recognizable with novel expertise. The decisive contribution is not situation of the skill knowledge but novel approaching about the want. Afterward, in the systemic phase, desires are well described, “structure resembling”, and simply expressed. These wants demands the composite technical explanations and the leader will regularly be one that takes novel technical visions to the difficulty. In the action to be taken, to enhance innovation, it is essential to value these differences so that the most probable basis of innovation can be recognized, cultivated, and sustained.
2. The kind of innovation that is expected to achieve something, whether technically multifaceted or uncomplicated, and whether practical to product or process, also depends upon the phase of development. During the unconnected situation most technical use are to the products that the industrious division will generate. A small number is to process upgrading and those that do takes place tend to be easy in use and to handle individual desires. Compound technical arrangement of process tools does not take fit when the beneficiary process is not well distinct and formless. The contrary is factual in the systemic phase. Separate drastic innovations, of yet main implication, rarely increase receiving when the beneficiary industrious division is in the systemic phase (Bessant, et al., 2009).

3. The entire range of difficulties to an innovation, like the suitable kind of innovation, modifies masterpiece with the phase of development. In the unconnected phase, confrontation moves around insights of insignificant. In the systemic phase confrontation comes from the troublemaking character of innovation. The replica commences to assist to clear the varying character of these difficulties.

2.4.5 Innovation Process According to Archer (1971)

The one most popular design theorist was from UK named as Bruce Archer. He had trained in Ulm and was at that point in time university lecturer at the Royal College of Art in London. In 1971 he published a six-phase model of the product innovation process, and within the phases he positioned diverse ladder. He did not begin with a product thought or an ideation phase, but was one of the first researchers to start the plan that product characteristics should be integrated with business strategies of the firm. He also put the efforts to integrate the engineering and commercial sectors together. His model is renowned as the incorporated replica and he was first to introduce such model. The model is set out in below Figure 2.5.

The essence of the concept lies in the compete enhancement of the product innovation process. He attempts to integrate the engineering and commercial world as well as associate NDP with firm’s strategy making i.e. business strategies. From this minute on, new product development was, in premise, not an remote process for product planners or advertisers only, but could be managed as a commercial instrument for expansion and success (Belliveau, et al., 2002).
Figure 2.5: The Innovation Process according to Archer (1971)
2.4.6 The Product Innovation Process According to Roozenburg & Eekels
(1995, original Dutch version 1991)

Eekels and Norbert Roozenburg made the earliest description of the Delft Innovation Model. They classified the overall product innovation process into four steps:

- Policy making, which prepared the product strategy;
- Idea generation, which generates the novel business idea;
- Authoritarian enlargement, in which three equivalent processes are there; product planning leads to a product plan, Promotion preparation leads to a market arrangement and manufacturing expansion leads to a assembly map;
- Realization consists of three major actions: production; distribution and sale; and (product)-use.

Policy making and idea generation are the components of product planning; product planning and Authoritarian enlargement are the components of product development. Product development and realization are the components of the complete product innovation course (see below Figure 2.6).

![Figure 2.6: The Product Innovation Process According to Roozenburg & Eekels (1995, original Dutch version 1991)](image-url)
2.4.7 Innovation Model Developed by the Innovation Consulting Group (1978)

One more corresponding expansion took place in the Innovation Consulting Group, also placed in Delft, but at TNO (The Netherlands Organization for Applied Scientific Research). It slowly developed an enhanced replica of the product innovation process, in which simple terms were used. In the improved model, they tried to unite the ideas of Archer, Brankamp, Eekels and Roozenburg (and all forerunners), but supplement it with some additional simple utilization and people trade to it. Innovation Consulting Group explored for simple-to-use models we had come through a four stage model of the (product) innovation process developed in Proctor & Gamble by Carlsson, Keane and Martin (1976). Their replica is based on Kolb’s model of experiential learning (Kolb, 1976). The four learning stages are ‘concrete experience’ (CE), ‘reflective observation’ (RO), ‘abstract conceptualization’ (AC) and ‘active experimentation’ (AE) as revealed in Figure 2.7 below.

Kolb planned his model to explain the learning process of persons. Carlsson, Keane and Martin practically used it to explain R&D procedure within Proctor & Gamble. Using the basis that the product innovation process (which in their viewpoint is identical to the R&D development) is alike to a learning process, because launching new products and services is the explanations (learning) of a company respond to its dynamic competitive scenario.

In 1978 we pioneered our four-stage product innovation model – the Step-by-step Innovation Model (Figure below).

**The four phases are:**

1. Strategy formulation;
2. Design brief formulation;
3. Product development;
4. Product launch and use.

Figure 2.7: The Step-by-Step Innovation Model Developed by the Innovation Consulting Group (1978)
2.4.8 Product Innovation Model: the Delft step-by-step Innovation Model

The total thorough model of the product innovation process composed of 17 different steps in a prearranged sequence (below figure). The Deft step-by-step product innovation model comprises the following essentials:

<table>
<thead>
<tr>
<th></th>
<th>1. strategic situation of the company</th>
<th>12. generating search areas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. internal analysis</td>
<td>13. chosen search area</td>
</tr>
<tr>
<td></td>
<td>3. evaluation</td>
<td>14. internal analysis of bottlenecks</td>
</tr>
<tr>
<td></td>
<td>4. external need analysis</td>
<td>15. evaluation</td>
</tr>
<tr>
<td></td>
<td>5. generating product ideas</td>
<td>16. product development</td>
</tr>
<tr>
<td></td>
<td>6. design brief</td>
<td>17. developing manufacturing</td>
</tr>
<tr>
<td></td>
<td>7. product design</td>
<td>18. evaluation</td>
</tr>
<tr>
<td></td>
<td>8. market introduction</td>
<td>19. manufacturing</td>
</tr>
<tr>
<td></td>
<td>9. distribution, promotion and sales</td>
<td>20. product launch</td>
</tr>
<tr>
<td></td>
<td>10. evaluation</td>
<td>21. product in use</td>
</tr>
<tr>
<td></td>
<td>11. external analysis</td>
<td></td>
</tr>
</tbody>
</table>

The above 17 essentials in the figure are actions or (secondary)-processes; the next five essentials consists of strategic situation of the company, (preferred) explore area, design concise, product plan and product instigate are the (in-between) outcomes of those course and are shown in the above figure.

When they made this model over the period they completely realised the existence of all different types of models of the product innovation process. The seventeen steps (activities) sufficiently include the complete product innovation process, but exclude required fundamentals for managing innovation (like choosing a project leader, outlining a team or corresponding to dealers).
Figure 2.8: The complete Product Innovation Model: the delft step-by-step Innovation Model (Delft, 2003).

2.4.9 Circular Model of the Product Innovation Process (March 2003)

Product innovation processes are projected to aid organizations to plan and launch novel goods, which consumers wish to purchase and please to utilize them. Hence, in the usage of goods, innovation process finished but new innovation process starts at the same time.

Thus, they arched the linear model to become the new circular model which reveals the product innovation process in detail (see Figure 2.9 below). Looking at the the process as a circular model recommends that there is no initiation nor ending, which is factual in the manner that if the product which has been through the process of innovation and results in grand success, it will force the rivalry to react i.e. they might launch new product or launch improved version of the product or service. This forced the innovative product to restart with is process of innovation to maintain the competency edge in the market.
In Figure above, the product-use step is positioned at the peak, and strategy formulation is the next step, positioned to the right, followed by the design brief formulation, Product development, and product launch and use steps. They ends where they initiates. To make this transformation from the linear version to the circular version in Figure above, they supplements some additional steps into the product-use phase to make the complete circle.

**The 26 innovation elements in the detailed model are given in the below table 2.3:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>product use</td>
</tr>
<tr>
<td>2</td>
<td>evaluation (commercial) of product use</td>
</tr>
<tr>
<td>3</td>
<td>evaluation (technological) of the product</td>
</tr>
<tr>
<td>4</td>
<td>strategic product position</td>
</tr>
<tr>
<td>5</td>
<td>evaluation</td>
</tr>
<tr>
<td>6</td>
<td>strategic situation of the company</td>
</tr>
<tr>
<td>7</td>
<td>external analysis</td>
</tr>
<tr>
<td>8</td>
<td>internal analysis</td>
</tr>
<tr>
<td>9</td>
<td>generating search areas</td>
</tr>
<tr>
<td>10</td>
<td>evaluation</td>
</tr>
<tr>
<td>11</td>
<td>chosen search area</td>
</tr>
<tr>
<td>12</td>
<td>external need analysis</td>
</tr>
<tr>
<td>13</td>
<td>internal analysis of bottlenecks</td>
</tr>
<tr>
<td>14</td>
<td>generating product ideas</td>
</tr>
<tr>
<td>15</td>
<td>evaluation</td>
</tr>
<tr>
<td>16</td>
<td>design brief</td>
</tr>
<tr>
<td>17</td>
<td>product development</td>
</tr>
<tr>
<td>18</td>
<td>market development</td>
</tr>
<tr>
<td>19</td>
<td>developing manufacturing</td>
</tr>
<tr>
<td>20</td>
<td>product design</td>
</tr>
<tr>
<td>21</td>
<td>evaluation</td>
</tr>
<tr>
<td>22</td>
<td>market introduction</td>
</tr>
<tr>
<td>23</td>
<td>manufacturing</td>
</tr>
<tr>
<td>24</td>
<td>Distribution, promotion and sales</td>
</tr>
<tr>
<td>25</td>
<td>product launch</td>
</tr>
<tr>
<td>26</td>
<td>evaluation</td>
</tr>
</tbody>
</table>
After this last assessment the new-fangled merchandise is in use, which will lead ultimately to commence the next product innovation cycle. The model is presenting that elements within the circle leads to internal characteristics of the business (like manufacturing), and elements outside the circle leads to the business-related and cut-throat surroundings of the business (like sales or market research). Elements on the central circle line are the key product innovation actions and outcomes.

2.4.10 Model Establishing the relationship between product development, product innovation and organizational performance (Udegbe Scholastica E.; Udegbe Maurice I., 2013)

Figure 2.10 represents the product development is symbolized by (PD), innovation is symbolized by (IN), and organizational performance is represented by (OP). The goal of this model is organizations (manufacturing and servicing firms) which in latest years have been featured by many pioneering goods in the forms of change in superiority, styles and their sizes. In general, author defined product development in terms of product lines and product size.

![Figure 2.10: The relationship between product development, product innovation and organizational performance (Udegbe Scholastica E. and Udegbe Maurice I., 2013)
However product excellence will be measured for the rationale of this research. Innovation is seen in shape, and innovation, in product process. It should be focussed at this point that there are other ways that may be helpful to check development of product and its innovation. Organizational performance in this learning is seen in provisions of success, sales amount, share of the market, satisfaction and loyalty of the consumers.


The framework in Fig. 2.11 below was shown from the fiction on organizational learning and innovation (Rogers EM., 1983, 1995; Hurley RF, Hult GTM, 1998; Brown SL, Eisenhardt KM, 1995; Mone MA, Mckiinley W, Barker VL, 1998; Monotoya-Weiss MM, Calantone RJ, 1994) (Hurley & Hult, 1998) (Hurt & Teigen, 1977). Authors have found that organizational learning is linked with the growth of novel information, which is important for firm capacity to innovate and for the overall performance of the firm (Hurley RF, Hult GTM, 1998). An organization dedicated to learning is expected to have known expertise in their field (Gatignon H, Xuereb J-M, 1997) (Lukas, et al., 1996), which results in better capacity to innovate in products as well as processes. Additionally, capacity to innovate is favourably connected to the overall performance of the firm (Mone MA, Mckiinley W, Barker VL, 1998). Learning orientation is imagined as consists of four elements: commitment to learning, shared vision, open-mindedness, and intraorganizational knowledge sharing (Hurley RF, Hult GTM, 1998; Hult GTM, Ferrell OC, 1997;1998). The second is included because learning cannot take place till the time firm has a successful and well-organized scheme of knowledge input, which permits a repeated test of previous judgment approaches and execution deeds (Moorman C, Miner AS, 1998). Additionally, the association between learning orientation and organizations innovation capacity is reliant on age of the firm (Lukas BA, Hult GTM, Ferrell OC, 1996). The grown-up the organization, the well-built is the connection between learning orientation and organization’s innovative capacity. Learning orientation
denotes to firm’s broad action of generation and application of information to improve cut-throat edge. This consists of creating and distributing knowledge and facts about changes in the market tastes, changes in customer desires, aggressive reactions of rivalries and upgrading of new modern techniques to explore novel goods that excels in comparison to their competitors (Moorman C, Miner AS, 1998). Learning orientation affects what type of knowledge is collected (Dixon NM, 1992) and how it is understood (Argyris C, Schon DA, 1978), assessed (Sinkula JM, Baker WE, Noordewier TA, 1997), and distributed (Moorman C, Miner AS, 1998). As shown in Figure below, the four elements of learning orientation are commitment to learning, shared vision, open-mindedness (Sinkula JM, Baker WE, Noordewier TA, 1997), and intra-organizational knowledge sharing (Moorman C, Miner AS, 1998).

![Figure 2.11: A framework linking learning orientation to firm innovation and performance (Roger J. Calantone, S.Tamer Cavusgil and Yushan Zhao, 2001)](image)

### 2.4.11.1 Learning orientation, Firm Innovativeness and Firm performance

Innovation entails the creation, approval, and execution of new-fangled thoughts, processes, goods or services. It is clear that a learning orientation is directly connected to the innovation of the firm. Many authors talked about the significance of such an direction to improve the capacity of the innovation (Damanpour F., 1991; Verona G., 1999; Cahill DJ, 1996; Day G., 1991). Learning takes place mainly
through firm’s action within and strategies in the outside environment. To gaze at innovation, consumer desires and needs, technical confusion, and cutthroat doubt are decisive surrounding aspects (Cahill DJ, 1996). Thus, a firm’s commitment to learning can improve its innovative capacity in three ways. Firstly, it is more probable to be dedicated to innovation, have the knowledge of modern technology, and use that know-how in innovations. It is more possible to have the ability to make and advertise a technical get through. Secondly, the business is not expected to fail to notice the openings formed by developing needs of the market place because it has the information and capability to know and foresee consumer wants (Damanpour F., 1991; Cahill DJ, 1996). To focus the significance of knowing those wants and desires, Urban and Hauser (Urban GL, Hauser JR, 1993) mentioned the term “core benefits proposition,” which defined that a firm must construct on its complete knowledge of articulated and hidden consumer desires (benefitted through knowing the needs of the customers very closely). It must be obvious and brief, and it must straightforwardly attached to the strategy of the product (to shape a mutual dream in the firm). Novel goods must reveal consumer worth (Urban GL, Hauser JR, 1993) if the threat of collapse is to be reduced. Thirdly, an firm dedicated to learning is probable to have better capacity to innovate than rivals (Damanpour F., 1991). One feature of such an firm is that it directly checks rival’s strategies at the market place (Gatingon H, Xuereb J-M, 1997). It comprehends the pros and cons of competitors, and takes the learning not only from their achievements but also from their fall downs (Slater SF, Narver JC, 1994; Lant TK, Montogomery DB, 1987). Various researchers have recognized the essence of learning orientation to the performance of the organization (Slater SF, Narver JC, 1994). A firm with a well built learning orientation is not only a store of information but a workstation of it. Comment from clientele, communication channels, and rivals must be studied to develop business strategies. A learning orientation affects the extent to which firms are probable to encourage creative learning as a long-term strategy (Sinkula JM, Baker WE, Noordeweir TA, 1997; Hunt SD, Morgan RM, 1996). The planned research recommends that there is no strategy that permits businesses to make more than expected profits (Jacobson R., 1992). One of the main significant feature of learning-oriented firms is that they forecast surroundings and changes in the market place tastes and desires and make changes accordingly. For instance, many successful auto companies have innovate their vehicles design for next year. Learning-oriented
firms are in fact wish to monitor their well set organizational systems and upgrade primary operating policies (Mone MA, Mckinsey W, Barker VL, 1998; Senge PM, 1990). Such firms make the marketplace rather than be obsessed by it. Such firms with competitive behavior and successful business strategies should lead to higher performance levels. Capacity to innovate is the main factor of overall performance of the firm (Mone MA, Mckinsey W, Barker VL, 1998), a judgment sustained by many experimental researches (Cooper RG, 2000; Cooper RG, Kleinschmidt EJ, 1987). The dissemination of innovation research also supports this opinion (Rogers EM., 1983, 1995) and recommends that organizations must be thoughtful to benefit from cut-throat environment in order to sustain in long-term (Li T, Calantone RJ, 1998).

2.4.12 Utterback/Abernathy’s Model of Industrial Product and Process Innovation, 1975

It is observed by Utterback and Abernathy that the speed of innovation, be it of product or process, is based on current stage of life cycle of the product. It has to be pointed out that this theory can defined to the life cycle of a one line of product and its production process as well as to a particular product creation and the development of a complete business division linked to this age band of goods. The course of replacement by a entirely changed, refined type of goods is not considered for examination. Figure 2.12 shows the distinctive guide of product and process innovation, including the three diverse stages.

![Image of Utterback-Abernathy's Model of Industrial Product and Process Innovation](image-url)
The first stage of the innovation process—the uncoordinated stage—is considered by regular alterations in design of the product and low output of the allied process. In this stage rivalry is just depends on the performance of the product, a leading design of the product has not developed as of now. Due to the clumsy and little included process of the manufacturing (technological and organizational) there are less restrictions for the betterment of the product. These regular alterations in the characteristics of the product affects the homogeneity of its process, which leads to higher costs of manufacturing.

After introduction of a main product design, the organization or the manufacturing division slowly moves into the segmental stage. Particular manufacture apparatus is launched, the speed of innovation linked to the process of the production rises, and the process becomes more synchronized. In this stage product innovations requiring major changes in the process of the production are cancelled; the increasing of the innovations in the product rate falls down. Costs of the manufacturing falls down which results in rising of the sales volume and higher manufacturing amount.

In the systemic stage, much incorporated technical answers are applied in the organization, manufacturing method is more uniform while cost reduction becomes an main aim. A closer connection between product and process characteristics takes place. Changes in the product and process are very integrated, which must be taken in to notice by executives. The course of consistency lessens the chances of more basic alterations in the product and process. The pace of innovations in product as well as process falls down due to these limitations.

2.5 Determinants of Product Innovation

2.5.1 Intelligence Generation

Intelligence generation has initial roundness in creativity. Intelligence generation has been defined as a psychological procedure, in which forms of antinomies are made through effective interactions among managers, companies and enclosing setup (Nonaka and Toyama, 2002). Wiig (1997) termed intelligence generation as knowing, determining and handling arranged, clear and willingful
intelligence arrangement, renewal and application. The application of intelligence generation to enhance function preference has also been focused. The definition “intellectual capital” includes all forms of companies brilliance that can be changed into income, plus expertise and procedures, copyrights and exclusive rights, as well as the talent and practice of workers and dealings with clientele and contractors. The quantity based opinion of the firm has led to an growing concern in the concept that brilliance is a important capital that companies must radically handle if they are to survive over rivals in the long run. Theory of intelligence-generating firms gives for firm’s to state that intelligence generation is important for product innovation (Nonaka and Takeuchi, 1995). Additionally, he also forwarded the inquiry of how firms arrange the procedure of intelligence generation and sharing and implement it to architect the novel goods, services or methods (Barringer and Bluedorn, 1999; Covin, 1991). Additionally, MNC’S tend to link in upper phase of information searching act (Hambrick, 1982; Narver and Slater, 1990; Jawaroski and Kohli, 1993; Barret and Weinstein, 1998; Nonaka and Toyama, 2002; Ramachandran and Ray, 2006).

Balancing healthy interaction with outside units, specifically clients gives the knowledge sharing and other capital that are important for novel business establishment (Barringer and Bluedorn, 1999; Fiol, 1996; Hornsby et al., 1993; Kanter, 1982; Lumpkin and Dess, 1996; von Hipple, 1978; Zahra, 1991). Christensen (1997) and Utterback (1994) barbed to the crisis of permitting clients to explain creativity. Given an tight consideration in to the lack of brilliance procedure and their causes, it is probable to scrutinize that either changes in the organization, the information and information intelligence or the human resource of the company are needed to consider them.

H1: Intelligence generation is a vital factor influencing the product innovation

2.5.2 Intelligence Dissemination

Companies behavior is based on market place brilliance consisting of the brilliance of clients and rivals. The theory of intelligence dissemination has also been focused for creative results. Exact framework and procedures are the tools for enhancing
Chapter 2: Literature Review

intelligence dissemination (Ruggles, 1996) (i.e., selecting, telling and motivating team to share intelligence) and companies acts (i.e. adjusting team to enhance sharing intelligence). It has been seen that person’s communication leads to higher beliefs, transparency and promises between them (Frances and Sandberg, 2000), which leads to the dissemination of exact transactions of peer groups and motivates their confidence. Knowledge with each other leads to a protective ecological system that facilitates the generation of different opinions leading to more efficient decision process (Nonaka and Takeuchi, 1995; Sheshadri et al., 2003).

H2  Intelligence dissemination is a vital factor influencing the product innovation

2.5.3 Technology selection (Drucker, 1997) (Efcharis, et al., 2008)

As technology innovation can assist the organization to make the cut-throat strategies through the production of competing goods and services and much more efficient process to make such products, or developing novel businesses. Academic researchers and executives are focussing only on the successful corporate strategies. Since there is rising trend in costs of innovation, reduced life cycles of innovation strategies and much more complex technology, the accomplishment of firm’s innovation goals will not be immediately realised but it can be seen in the later stages. Studies can be separated in two parts i.e. external factors and internal factors (Hao & Yu, 2009) (Lawless & Anderson, 1996). The first group that focuses on the external factors which are responsible for the success of the innovation, (A.B. Assis, 2003; B. Chakravorti, 2004; C.C. Rogerio, M.G. Fabio and L.M. Gilnei, 2007), also monitors that the innovation success depends upon the joining hands of many firms together where in each firm holds different potential to tackle the competing demands in a versatile environment ( W.G. Biemans, 1992; J.A. Czepiel, 1975; C. Debresson and F. Amesse, 1991; H.G. Gemunden, T. Ritter and P. Heydebreck, 1996). The second study is focussing on internal factors which are responsible for the success of the innovation such as culture of the company where it survives, what corporate strategies firm is adopting, dealings in relation to capability of technology and partnerships with capable parties (S.L Brown and K.M. Eisenhardt, 1995; R.G. Cooper, 1997; R.G. Cooper and E.J. Kleinschmidt, 1995). Given these two parts for
accomplishing innovation success, we require to evaluate the fundamental potentials on which their effect is based. Numerous researches have seen into the task of technological capability participated in innovation success (K.H. Tsai, 2004; T.Ritter and H.G. Gemunden, 2004), and consider technological potential as the key of innovation success. Although, other than technologies potential, the other capabilities are also important for the success of the innovation such as capabilities of the executives, effective use of resources of the firm (B.Carlsson and G.Eliasson, 1991; G.Dosi and D.J. Teece, 1993; F.Malerba and L. Marengo, 1995; R. Sanchez, 1996). Within the executive potential, technology executive potential has been catched by researchers these days. Apart from this, firms has to make the choice of new methods and techniques, also launch new technology on a regular basis as to survive in the competitive world and also to meet the changing demands and tastes of their customers. There exists the favourable connection between selection of the technology, technological innovation and performance of the firm. Selection of the best and appropriate technology specially, strategy to choose the right technology is considered as the major factor of product and process innovation.

The theory concept is introduced to explain the effect of capability of the technology and within this, the capability of management to handle technology on a firm’s innovation strategies success and results of the firm. Later on, selection of the right and appropriate technology is included. Moreover, selection of technology is a decision taken at different stages (M. Torkkelo and M. Tuominen, 2002), incorporating strategy decided to choose the technology and existing selection of the technology which is available. Strategy used for the selection of the technology included emphasising more essence on development of novel products and R&D and to fulfil the wish to become the leader in the selection of the technology. An organisation who wish to choose right technology always pay emphasis on R&D, hire experts with the knowledge of specific areas and also develop healthy environment in the company which is suitable for innovation. These are the primary ingredients of capability of technology judgement. In addition, real selection of technology includes the creation of novel and modern methods of manufacturing, which are referred to as the part of technology capability (Cetindamar, et al., 2009). Management of the technology involves resources required to handle the new
technology, management of the entire firm, management of total quality system where as strategy needed to choose technology involves planning of the resources needed, mode of managing quality system and deciding the structure and hierarchy in the organisation. Hence, management of the technology will be effected directly or indirectly by strategy required to select the technology. In addition, selection of the technology decides the importance of technology management. For instance, if a business chooses self-regulating R & D plan or a foremost plan, the explanation of technology supervision is predicting the technology, R&D management of employees and risk levels (Brockhaus, 1980). If a business chooses simulated plan or a subsequent plan, management of the technology will given more emphasis to attainment of technology specifically, cost, speed and the extent of attaining technology. Moreover, selection of the technology is the key for the process of technology management.

The goal of selection of technology is to get novel expertise, materials and new schemes which will aid the firm to develop demanding goods and services and efficient processes to develop such products (M.Torkkelo and M.Tuominen, 2002). The literal meaning of selection of technology is the creation of modern methods, which gives chances to both goods and services segregation and developing new ways of business (J.Morone, 1989). Apart from this, few studies stated that appropriate technology strategy that chooses the right technology is important to the success of the firm innovation process (S.B. Hao and B.Yu, 2009; G.M. Bao and J.Yang, 2004). Capability of the technology means that a firms' capacity to know, utilize and take advantage of current technology in-house (T.Ritter and H.G. Gemunden, 2004). This capacity helps the firm to put worth to existing goods and services and also through the development of new and novel products and their methods of manufacturing such products. At that time, the firm becomes a market leader. Therefore, it is proved that organizations with more capability to handle technology are successful than lower levels of capability to handle technology. Various firms put higher emphasis on R&D by hiring professionals of different areas, developing a healthy culture for the firm and intake of more resources needed for technology selection. Although, the outcomes of R&D are not favourable for the success of the innovation and development of novel business. Th main Cause to this
fact is that the firms does not focus much on the management of technology capability. Management of technology capability is a type of changing and versatile capability targeting to know the manner in which a firm collects resources needed and also determines the process of innovation over a period of time, how the resources are produced and set up its old process and resources and also from where they takes new resources needed (D. Cetindamar, R. Phaal and D. Probert, 2009). The extent of this capacity tells that how effective the resources are utilized. Numerous researches have proved that management of technology capability puts higher effect on the development of novel goods results (G.M. Scott, 2000; W.W. Wu and B. Yu, 2010; D.Z. Levin and H. Barnard, 2008). Numerous researches have monitored the function of innovation in technology that participated in the development of the performance of the firm. Robinson’s experimental research measures that the effect of innovation in goods is on share of the market and the outcomes will be positive as compared to rivals in terms of increased market share (W.T. Robinson, 1990) (Myers & Marquis, 1969) (Naranjo-Valencia, et al., 2011).

Deng proposed that innovation is the focal mover of firms’ output and expansion, copyright measures showing the effect of firms’ study on other innovations and the nearness of R&D to the field of science are connected with the results of research oriented firms’ (Z.Deng, B.Lev and F.Narin, 1999). Yamin scrutinized the connection between innovation and performance levels in the firm in australian firms’ and the outcomes revealed that performance of the firm is linked to the innovation success which includes product, administrative, and technical innovation (S.Yamin, A. Gunasekaran and F.T. Mavondo, 1999) (Narver, et al., 2004) (Nemeth, 1997).

![Figure 2.13: The theoretical model (Shengbin Hao, Bo Yu, 2011)](image)

$H_3$ Technology selection is a vital factor influencing the product innovation.
2.5.4 Operation Priorities – Cost, Speed of delivery, Flexibility and Quality (Alpkan, et al., 2003)

Big business authors who does research in this field mention that operations plans and operations main concern among the main striking subject matter of operations management, since this topic are amongst the important elements of financial performance and of planned processes of an firm (Sum et al., 2004; Boyer and Lewis, 2002; Malhotra et al., 1994; Hayes et al., 1988). Here we implement as operations priorities flexibility, quality, cost, and delivery, which have become broadly used as declaration of the aggressive magnitude of production (Voss, 1995) (Liu, et al., 2009). Organizations target to favour from supplementary economical benefit and to attain improved company performance through the use of operations strategies, which have to be in appropriate arrangement with the characteristics of the aggressive setting the organization is in. Numerous authors have inspected the associations between production strategies and financial performance (Corbett and Campbell-Hunt, 2002). Based on an experimental research, Noble (1997) explained that production strategies of blue-chip firms are similar to loss-making firms. To comment on, their results proved that improved performance organizations are more likely to focus on potentials parallel and are more probable to have defined business strategies. McAdam and Keogh (2004) examined the connection between organization outcome and its awareness with innovation. They established that organizations inclinations to innovations are important in the manner of making the association between competitive advantage and innovation (Sethi, 2000) (Shapiro, 2006). Zahra and Sidhartha (1993) concluded that business strategy is a vital forecaster of corporate performance. Gunday et al. (2008) mentioned that based on an experimental research that innovations within the organization are benefitted with higher financial outcomes.

Operation priorities components are adapted mainly from Boyer and Lewis (2002), Alpkan et al. (2003), Noble (1997), Ward et al. (1998), Vickery et al. (1993) and Kathuria (2000). Elements of production or operations performance, i.e. speed, quality, flexibility, and cost efficiency, seem to be correlated to the corporate performance in process, and product innovations according to the recent literature (e.g. Quadros et al., 2001). For example, according to Koufteros and Marcoulides
regular hard work and superior outcomes in innovations promote learning within the firm and boosts the rate and superiority of the processes. Therefore, technical innovation can simply be included and any plan or eminence shortages have been improved quicker than the rivals. In addition, López-Mielgo et al. (2009) told that specifically innovations within the process puts a positive effect on the TQM of the firm. Other than quality and speed of the process, performance of the firm is based upon other aspects i.e. efficiency in costs and flexibility (Alpkan, et al., 2007). Accomplishment in the revitalization hard work particularly in organizational system, production process, and new-fangled products can give widely to the spreading of information and efficiency of harmonization inside the firm, which are essential for flexibility and effective costs (Koufteros and Marcoulides, 2006). In this concern, Liu et al. (2009) reported in an experimental research the constructive link between flexibility and success of the novel products. As for the reduction in costs and its effectiveness, Peters (2008) reports that all the innovations with in the process does not results in savings of the costs but some helped the organizations to sell products at prices lower than competitors. Gonzalez-Benito (2005) mentioned that the capability of the manufacturing function that becomes the source of ready for action strategy for the organization. Manufacturing performance is the combination of firms’ achievement in enhancing speed, quality, flexibility, and cost efficiency in the day-to-day workings results in the improvement of market place status and financial outcomes. The previous experimental research reported that inspiration for using operations objectives as increase in the flexibility, improvement in quality of products for the contentment of the clients, speed of the process and cost efficiency helps in the improving the organizations performance as a whole (e.g. Alpkan et al., 2002; Alpkan et al., 2003). Particularly for the manufacturing and market performance link, Li (2005) confirmed that industrialized potentials -such as higher productivity levels, speed of process etc. leads to the better market place performance by improvement contentment of the consumers and enhancing client dealings. Manufacturing performance, as a blend of attainments in all these – cost reduction, improved quality, increased flexibility, speed of the process- is one of the sources of inspiration for success (e.g. Chenhall, 1997), therefore efficiency and competence in manufacture would result in higher gains. Additional experimental research reported this statement
Chapter 2: Literature Review

(e.g. Worthington, 1998). For example, Fullerton and McWatters (2001) pointed out those organizations that have spent much more in excellence exercise gained from higher financial outcomes. Likewise, Fullerton and Wempe (2009) in a current research, develops a constructive association between production performance and financial performance.

\[ H_4 \quad \text{Flexibility is a vital factor influencing the product innovation} \]

\[ H_5 \quad \text{Dependability/ Delivery is a vital factor influencing the product innovation} \]

\[ H_6 \quad \text{Quality is a vital factor influencing the product innovation.} \]


The harmonious and the synchronized implementation of diverse innovation forms is an significant determinant for the firms agreement (Damanpour, Gopalakrishnan 1999). Organizations have to introduce novel classy goods in a dynamic scenario and their capability to rise up to complete manufacturing amount quickly is important for accomplishment (Pisano 1997). As the life cycle of the product reduces, it becomes more important to spread manufacturing capacity quickly to produce sales amount and earn growth funds. For manufacturing firms, product innovation system and specifically its related processes are important (Li, et al., 2007). Due to technical reasons there is a fixed association between technological goods and the process used to produce goods. The executives who looks after innovation process has taken in to account the connection between product and process (Hayes & Wheelwright, 1979) (Kim, et al., 1992) (Koufteros & Marcoulides, 2006). Alterations in the product scheme have major effects for the organizations production arrangement and for technological and organizational processes (Utterback, Abernathy 1975; Hayes, Wheelwright 1979a, 1979b; Kim et al. 1992). The alteration in the process essentials are very important, if new product is launched. The stiffness of the connection between product and process characteristics changes with the manufacturing division. In the process business like pharmaceuticals, chemicals etc. (“Process Driven”, “Process Enabling”, Pisano 1997) an unexpected close up association between products and production process can be observed. The
examination centres on the innovation process in production firms. Innovation management in industrialized firms is expected to develop incorporated innovation and business strategies. An enhanced results of industrialized firms can be usual from closer associations between innovation of product as well as process (Kim et al. 1992). “Supervising this product-process link is one of the peak dare of the age” (Ettlie 1995, p.1224). The product-process life cycle assumption of Utterback and Abernathy (Utterback, Abernathy 1975) provides a helpful replica assisting to know the trend of various manufacturing process in innovation. This replica achieves something in developing the close links between the stages of life cycle of the product, the related process stages and its cut-throat strategies.

The importance of technical and firms togetherness in product and process in the light of business and innovation strategies can be seen in the current literature review (Damanpour, Gopalakrishnan 1999; Pisano 1997; Ettlie 1995; Kim et al. 1992; Prahalad, Hamel 1990). In these examinations, it is checked that production firms that highlights the joint product-process integration process along with the rules, procedures, policies and systems are more profitable. In opposition to the above, occasionally the concept that firms product and process progress potential are commonly selective, can be seen in the current literature. Experimental outcomes revealed that combined strategies if applied in an efficient and effective way can increase the potential of product and related processes (Milling 1998; Pisano 1997) (Hall & Mairesse, 2006). Li et al.’s (2007) study on Chinese firms also proved that innovations in product and process are linked to each other very closely. Although, current literature does not have experimental outcomes that proved this relationship of product and process. Still, few unrelated researches exist that mentioned this relationship of product and process. For example, Oke’s study on British firms (2007) shows that if related processes are well built, then it leads to the betterment of the product and process innovation automatically. Hence, enhancement of the processes is a main factor for the higher innovative production levels. Therefore, innovative way out providing the ladder of the production process with recently better returns - such as quality of the manufacturing goods, speed, cost of the manufacturing goods and value can improve the probability of the main components
of the product, its ingredients, major specifications, main technical issues etc. to fulfil
the requirements of the consumers much better than ever before.

**H7** *Product- Process Innovation is a vital factor influencing the product innovation*

### 2.5.6 Marketing Support of the Product (Hauser, et al., 2006) (Henderson, 1994)

It is very ordinary that innovations in the product are created through alterations in the
market place and consumer desires. Consumer markets have given high essence to the
major functions of the marketing. Needs of the consumer can be satisfied through
promotions and novelty, which create likelihood for additional manufactured goods
modernism. Performance of the innovation in the form of success of novel goods is
associated to an increase in the share of the market and sales volume, since it adds
significantly to the contentment of old customers and new clients can be gained (e.g.
Pelham, 1997; Wang and Wei, 2005). It is also probable to declare that in adding to
novel product achievement, accomplishment in process, organizational and marketing
innovations results in the pleasure and contentment of consumers and also increase
the customer base towards the innovation companies (Lhuillery, 2014). In current
scenario where customer is the king of the market, where number of customers is
important to get financial outcomes, competitive advantage in the market is one of the
significant basis of performance of the financial results (e.g. Li, 2000) since, sales
volume and share in the market may openly add to the financial aims, major
contributors are rising prices and sales amount and falling variable costs per unit
which results in increase in profits of the firm (e.g. Buzzel and Gale, 1987;

**H8** *Marketing Support of the Product is a vital factor influencing the product innovation*

### 2.5.7 Impact of Innovations on Firm Performance (Alpkan, et al.,

Firm performance can be improved through innovation in many ways. Specifically
there are four proportions of performance are used in the previous research to measure
the performance of the organization (Narver and Slater, 1990; Barringer and
Bluedorn, 1999; Antoncic and Hisrich, 2001; Hornsby et al., 2002; Hagedoorn and Cloodt, 2003; Yilmaz et al., 2005). These proportions are financial performance, market performance, innovative performance, and production performance. Innovation has a significant contact on business performance by creating a better marketplace point that communicates economical benefit and greater outcome (Walker, 2004) (Altuntas & Donmez, 2010) (Lin & Chen, 2007) (Liao & Chuang, 2006). A big figure of researches are based on the association between innovation and its results that generates a favourable assessment of superior innovation which leads to higher financial outcomes (Damanpour and Evan, 1984; Damanpour et al., 1989; Deshpande et al., 1993; Dos Santos and Peffers, 1995; McGrath et al., 1996; Gao and Fu, 1996; Han et al., 1998; Olson and Schwab, 2000; Hult and Ketchen, 2001; Du and Farley, 2001; Calantone et al., 2002; Garg et al., 2003; Wu et al., 2003).

The two ordinary forms of innovation scrutinized are: Process and product innovations. The researches by Marcus (1988), Ittner and Larcker (1997), Whittington et al., (1999), Olson and Schwab (2000), Knott (2001) and Baer and Frese (2003) based just on process innovations while researches of Atuahene-Gima (1996), Subramanian and Nilakanta (1996), Han et al., (1998) and Li and Atuagene-Gima (2001) (Nistish, et al., 2010) based just on product innovations. Numerous of these studies hold to a extent a favourable relationship between performance of the organization and innovation but at the same time there are few researches that establishes the unfavourable or no connection at all (Capon et al., 1990; Chandler and Hanks, 1994, Subramanian and Nilakanta, 1996). As Miller (2001) assured largely organizations look for innovation in technology to benefit cut-throat strategy in their specific market place. Therefore, support of marketing and organizational innovation is must for this hard work to succeed. In general, studies ignore the marketing and organizational innovations which are uniformly important to the expansion and efficient working of the organization (e.g. Damanpour and Evan, 1984, Damanpour 1991). Comparatively little researches on the potential of innovation support marketing and organizational innovations. They report that more organizations with innovation strategies focus on the styles of management (Baldwin and Johnson, 1996) and attain long-term growth along with the superior results (Han et al., 1998;
Chapter 2: Literature Review

Ravichandran, 2000; Hult and Ketchen, 2001; Guan and Ma, 2003). Wolff and Pett (2004) and Walker (2004) carried out relative study for comparing the impact of product and process innovation on the performance of the organization. They reported that specific enhancement in the product are favourably linked with the expansions of the organization. Gopalakrishnan (2000) widened the research topic while focussing that the speed and magnitude is equally important characteristics of innovation, two of them have favourable effect on the performance of the organization. Regardless of the fragile connection they established, Lin and Chen (2007) (Montoya-Weiss & Calantone, 1994) (Morris & Kuratko, 2002) connected innovations with bigger organization level of sales and they mentioned that organizational innovations relatively than technological innovations showed to be the largely crucial cause for sales level (Garcia & Calantone, 2002). On the other side, Johne and Davies (2000) make sure that sales level will be improved through innovation in marketing strategies by enhancing the consumption of the product which produces extra earnings for the organization. Moreover, Oke (2007) in a current experimental research on UK companies revealed that many forms of innovation were established to have positive relationship with the performance of the innovation. Performance that takes place because of innovation strategies occurs as a result of accomplishments in the firm such as rejuvenation and enhancements done in various forms such as process, marketing, organizational system, marketing etc. Hence, innovation outcome is combined factor that comes from various mark points such as new projects, new techniques, new methods, novel products, new patent and copyrights, new ways of organizational system (Hagedoorn and Cloodt, 2003). Innovative performance is considered in the research as one of the large significant factor of other elements of organizational performance such as creation of an firm knowledge environment and starting new renewals, enhancements, discoveries and learning from past experiences and acceptance to quick alterations in versatile atmosphere (Bulut & Yilmaz, 2008). For example, Han et al. (1998) focussed that innovative performance is the collective result of administrative and technological innovation that leads favourably to expansion of the firm and long-term profits. They declared that innovative performance is the lost connection between firms business strategies and outcomes. Damanpour and Evan (1984) (Walker, 2008) reported that firms can deal with
competitive demands by incorporating administrative and technological innovations in to their firms system which leads to the enhancement and betterment of their long-term objectives. Generally, to fulfil the targets of manufacturing and marketing such as excellence quality of products, improvement in share of the market, cost reduction, increase in flexibility, expansion of novel markets, innovations on regular basis are done (Quadros et al., 2001) (Walker, 2004). In initial stages of investment in innovation strategies, it might cause short-term losses to the firm but in the long-run, it leads to the positive relationship between firm’s profits and business innovation strategies. Lawless and Anderson (1996) mentioned that implementation of novel expertise for innovations entail an early punishment. Likewise Damanpour (1984) focussed that usually a grave point in time stage may go by to monitor affirmative effects of innovations on the performance of the organization. This is only primary reason that innovative performance is initially linked to the other factors of performance such as contentment of the consumer, speed delivery of the orders and later on, it leads to the better and improved financial outcomes (Appuhami, 2007) (Walker, 2006). In nutshell, the innovative performance enhances the marketing and production performance which in turn improves the financial returns thereby leads to higher earnings for the management.

2.5.7.1 Financial Performance (Aktan & Bulut, 2008) (Andriessen, 2007)

The operations and its financial outcomes are inter-related to each other. Research has proved that the topic of firm performance is composite in nature i.e. it is linked to many factors at the same time (Venkatraman and Ramanujam 1986). Within the firm performance, the emphasis is always on the financial results because ultimately everything is boiled in to financial terms and it is accepted from long time. Additionally, investor’s, major shareholders and other stakeholders such as creditors, debtors etc. are keen to know the financial condition of the organization (Fis & Cetindamar, 2009) (Floyd & Woolridge, 1990). The facts which are of financial nature such as share prices, net revenue generated, net profits, return on equity etc. are the most primary and acceptable information to know the actual condition of the firm (Gatignon & Xuereb, 1997) (Gopalakrishnan, 2000) (Gunday, et al., 2011). On the other side, knowledge about
finance must be provided to regulatory and legal houses to calculate the taxes to be paid. The disclosure of financial information is made to the general public or to the regulatory houses based on many factors such as type of ownership i.e. private or public, size of the firm i.e. big or small, whether it is listed on the stock exchange or not listed (Heshmati & Loof, 2006) (Lumpkin & Dess, 2001) (Malerba & Marengo, 1995) (Mankin, 2007). Corporate performance means the capacity of the firm to produce new earning sources or profits from the day-to-day working operations of the organization over a period (Fullerton & Wempe, 2009) (Gan & Saleh, 2008) (Zahra’, et al., 1999). The financial performance actions can be separated into two main forms: (1) conventional actions based on bookkeeping/financial information (i.e. the consequence of measures on one year’s earnings, ROI, ROE, etc.) which shows the past results of the organization; (Bartoloni & Baussola, 2009) and (2) current actions derived from share market prices (i.e. Stern Stewart & Co.’s Economic Value Added [EVA] and Market Value Added [MVA] approaches) which are based on stock valuation doctrine (Kaplan and Norton 1992, 1993,1996, 2000 and Broadbent and Cullen 2005) (Zaltman, et al., 1973).

Flourishing commercial activities will certainly influence the organizational monetary outcomes in the extended period, hardly in the small period; there might be no connection among the product innovation environment aspects and organizational monetary results norm due to project funds and organizational in-house reserve uses or probable sufferings (Hayton 2005) (Sharma, 1999). Therefore, the initial symbols of effective firm’s attainments may be extracted from market, for instance, improvement in level of sales and increase in share of the market. Later, in the longer period, these enhancements in the aggressive period in the market may lead to superior monetary results as well as the results of product innovation (Wagner, 2011) (Zirger, et al., 1990). Thus, one or more than one elements i.e. market share, ROA, ROI, Profitability, growth percentage, revenue generated etc are taken in to consideration to monitor the link between product innovation and firm performance. Financial performance decisive factor are tailored primarily by studies of Barringer and Bluedorn (1999), Hornsby et al. (2002), Narver and Slater (1990), Zahra (1995) and Yılmaz et al. (2005).

**H₉** *Intelligence generation is a component of product innovation that has a significant impact on financial performance.*
Chapter 2: Literature Review

$H_{10}$ Intelligence dissemination is a component of product innovation that has a significant impact on financial performance.

$H_{11}$ Technology selection is a component of product innovation that has a significant impact on financial performance.

$H_{12}$ Flexibility is a component of product innovation that has a significant impact on financial performance.

$H_{13}$ Dependability/ Delivery is a component of product innovation that has a significant impact on financial performance.

$H_{14}$ Quality is a component of product innovation that has a significant impact on financial performance.

$H_{15}$ Product- Process Innovation is a component of product innovation that has a significant impact on financial performance.

$H_{16}$ Marketing Support of the Product is a component of product innovation that has a significant impact on financial performance.

Table 2.4: Showing Constructs, Measurement of Variables and Authors

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Measurement Variables for Investigation in the Study</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intelligence Generation</td>
<td>a) Process of intelligence generation</td>
<td>Nonaka and Toyama, 2002; Wiig, 1997; Ramachandran and Ray, 2006</td>
</tr>
<tr>
<td></td>
<td>b) Design of new products, services or systems.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Capability to generate intelligence and utilize it</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Capability to engage employees in innovative activities.</td>
<td></td>
</tr>
<tr>
<td>Intelligence Dissemination</td>
<td>a) Interaction among employees</td>
<td>Ruggles, 1996; Frances and Sandberg, 2000; Nonaka and Takeuchi, 1995; Sheshadri et al., 2003</td>
</tr>
<tr>
<td></td>
<td>b) Availability of appropriate infrastructure and processes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Familiarity with colleagues</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Identifying and designing intelligence dissemination processes.</td>
<td></td>
</tr>
</tbody>
</table>
## Constructs

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Measurement Variables for Investigation in the Study</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b) High emphasis on R&amp;D activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Selection of advanced technology in industry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Develops new products totally different from the current ones.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e) Product modifications have a better market response.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Increase the product orders with different specifications.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Ability to change machine and equipment priorities.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Increase the ability of flexible production.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Determines and eliminates non-value adding activities in delivery related processes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Increasing the ability to meet the delivery commitments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Decrease the make span from taking the orders to the completion of delivery</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e) Increase the just in time delivery.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Increasing the product and service quality compared to rivals.</td>
<td></td>
</tr>
</tbody>
</table>
## Constructs

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Measurement Variables for Investigation in the Study</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing support of the product</td>
<td>a) Renews the design of the current and new products</td>
<td>Hauser, et al., 2006; Henderson, 1994; Pelham, 1997; Wang and Wei, 2005; Lhuillery, 2014; Li, 2000; Buzzel and Gale, 1987; Venkatraman and Prescott, 1990, Wang and Wei, 2005</td>
</tr>
<tr>
<td></td>
<td>b) Renews the distribution channels without changing the logistics processes.</td>
<td></td>
</tr>
<tr>
<td>Product-Process Innovation</td>
<td>a) Determines and eliminates non-value adding activities in production processes.</td>
<td>Ettile, 1995; Fruin, 1998; Galbraith, 1982; Meeus &amp; Edquist, 2006; Damanpour, Gopalakrishnan 1999; Pisano, 1997</td>
</tr>
<tr>
<td></td>
<td>b) Decrease manufacturing cost in components and materials of current products.</td>
<td></td>
</tr>
<tr>
<td>Financial performance</td>
<td>a) Increase in the ratio of return on sales</td>
<td>Aktan &amp; Bulut, 2008; Andriessen, 2007; Venkatraman and Ramanujam 1986; Fis &amp; Cetindamar, 2009; Floyd &amp; Woolridge, 1990; Gatignon &amp; Xuereb, 1997; Gopalakrishnan, 2000; Gunday, et al., 2011; Heshmati &amp; Loof, 2006; Lumpkin &amp; Dess, 2001; Malerba &amp; Marengo, 1995; Mankin, 2007</td>
</tr>
<tr>
<td></td>
<td>b) Increase in the ratio of return on assets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Increase in the general profitability of the firm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Increase in the cash flow of the firm.</td>
<td></td>
</tr>
</tbody>
</table>


- **Development, extension and achieving a monopoly position in the market:**
  A firm that has the ability to change their goods from their rivals running their business in the same line of product to a good extent ill able to earn extra profits comparatively (Verona, 1999). This can be seen in the businesses who manufactures unique and novel products and make it attractive for customers to purchase them that such organizations always stay in benefit and will survive in the business in the long run ("Product Differentiation",2014). Thus, companies
who will able to utilize resources effectively, efficiently and innovative will able to grow faster at a large scale.

- **Brand change**: companies try to lure their clients to stick to their brand and also tries to focus on new customer to switch to their brands by offering them innovative products and services and hence able to increase the customer base (Vourlioti, et al., 2008). One case of innovation where customers immediately shifted from all brands to one particular brand is the Apple Iphone because of its unique characteristics. Customers of Nokia, Sony Ericsson, Motorola, Samsung shifted in huge number to Apple Iphone. This is the instance of mobile industry.

### 2.6.1 Advantages of Innovation to the organization (Australian Bureau of statistics, 1994, 1995) is given below in the table 2.5

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Advantages / Goals of Innovation to the organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Enhancement of quality of the product</td>
</tr>
<tr>
<td>2</td>
<td>Development of novel market place</td>
</tr>
<tr>
<td>3</td>
<td>Improves the share of the market</td>
</tr>
<tr>
<td>3</td>
<td>Stabilised the share of the market</td>
</tr>
<tr>
<td>4</td>
<td>Increase the range of the products in the same line</td>
</tr>
<tr>
<td>5</td>
<td>Meet regulations and legal standards</td>
</tr>
<tr>
<td>6</td>
<td>Achieve costs efficiency</td>
</tr>
<tr>
<td>6</td>
<td>Betterment of conditions of the working in the organization such as safety measures</td>
</tr>
<tr>
<td>6</td>
<td>Enhances the flexibility in product adoption</td>
</tr>
<tr>
<td>7</td>
<td>Minimise impact on ecological system</td>
</tr>
<tr>
<td>8</td>
<td>Achieve manufacturing costs at minimum level</td>
</tr>
<tr>
<td>9</td>
<td>Immediate replace the product, out of demand</td>
</tr>
</tbody>
</table>

### 2.6.2 Numerous disadvantages of product innovation include:

- **Opposite impact of the product innovation**: It is not always necessary that the innovation in the goods and services shows the positive relationship between
profitability and innovation success (Porter & Kramer, 2011). It may take the turn to other side. For instance, some companies not necessarily create new products but can also lead to improvements in the existing line of products and now it might happen that product is no more in demand by customers and hence it ruins the profits of the firm and throw it out of industry.

- **Increase in costs and risk levels**: whenever the firms try to increase the product range by differentiating from its rivals, they incur extra costs in hit and trial process. This approach also demands lot of time, which might lead to wastage of time at the end and level of risk and uncertainty also increase because of continuous efforts towards developing innovative products (Quinn, 1985) (Quinn, 1979).

- **Disturbing the exterior world**: For product innovation to take place, the firm will have to alter the manner it is moving, and it might results in bad relations and dealings with contractors, clients and its business peer groups (Ritter & Gemunden, 2004). Moreover, alterations more than need is there, might lead to bad brand image in the minds of the final consumers.

### 2.7 Challenges in Product Innovation:


- How to search novel markets where there is well-built worth to take it? Specifically, identify new markets where there’s strong value to capture?

- How to infiltrate novel market places and throw the existing brands?

- How to get off the risk of disturbance in the main line of business?

- How to increase the Return On Investment (ROI)? In other way, how to ensure that every penny invested in innovation strategies will bring the positive and higher returns?

- How to develop new products different from existing ones to attract and increase customer base?
II/ **Increasing the product range** (Peters, 2008) (Pinchot, 1985) (Subramanian & Nilakanta, 1996)

- How to enhance my existing goods and services and how it will lead to develop customer worth?
- How to develop new products that new consumers accept and feel satisfied?
- How to decrease the costs of the product without sacrificing its quality?


- How to develop the healthy environment in the organizations which will make easier for the organization to adopt changes wholeheartedly and easily. Also, how to generate new ideas and apply them?
- How to **sell innovation to one’s boss**? How to consider innovation as the source of success and core element of earning higher profits?
- How to decrease variations and mistakes in the process of innovation?
- How to select the preference of one project over second one and what criteria will decide this?

IV/ **Closeness of product-process relation** (Ettlie 1995, p.1224) (Page, 1993) (Tellis, et al., 2009) :- The nearness of the association between product and process changes from industry to industry. For example in the chemical company (Pisano, 1997) an unusual link can be seen. Maintaining the nearness between product and process innovation is one of the top challenge of this era. For a growth of incorporated innovation and production policies, taking into consideration the unyielding product-process contact a study of the dependency on each other i.e. Product characteristics and linked manufacturing process appeared to be helpful.
Given the width, complication and indefinable environment of innovation, its dimension is very demanding. The important of innovation is increasing day-by-day, therefore, there is real need to measure it. There are two schemes to measure i.e. Conventional and modern technique. The traditional view emphasizing on considering the how the research activities are going inside the organization (Brown, 2011) (Torkkeli & Tuominen, 2002). For instance, how much organization is investing on research activities, number of patents, number of copyrights, number of research publications, number of national and international conferences attended etc. Currently, due to stiff competition in the market place, the focus is shifted on consumer needs and wants, changing taste buds of the customer, ongoing trends in the market place and finally everything boils down to finance i.e. how much financial return the firm is generating on regular basis. Therefore, the new orientation is based on three things i.e. inputs, process and output measurements (Anthony, 2007; Hempel, 2006; Mankin, 2007; Andrew, 2009).

2.8 **Significance of Product Innovation**

Firms must be able to adjust and emerge if they willing to sustain. Firms’ work with the information that their rivals will surely enter to the marketplace with the new products that alters the bases of fight. The capability to alter and adjust is important to sustain. Currently, the concept of creativity is broadly adopted. It has become component of our art so much so that it comes on becoming a common place. But even though the definition is now seen in our dialect, to what degree do we fully know the theory? Additionally, to what degree is this information distributed? A researcher’s opinion of creativity may be very distinct from that of an accountant in the similar firm. The Apple Inc. story puts in to situation the field of innovation and new product development. In this instance, Apple’s introduction of Novel goods in the cell phone marketplace will assist Apple bring about enhancing revenues and moved up company. Innovation is the main part of many firms’ function. Not to create is to shutdown, says Christopher Freeman (1982) in his popular research of the economics of innovation. Therefore, firm that have based themselves as technovation
market rulers have revealed an capability to grow nourishing novel goods. On virtual base, all business, from aerospace to pharmaceuticals and from motor cars to computers, the major firms have shown an capability to create (see table 5).

**Table 2.6: Market Leaders in 2007**

<table>
<thead>
<tr>
<th>Industry</th>
<th>Market Leaders</th>
<th>Innovative new products and services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell phones</td>
<td>Nokia</td>
<td>Design and new features</td>
</tr>
<tr>
<td>Internet-related industries</td>
<td>eBay; Google</td>
<td>New services</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>Pfizer; Glaxosmithkline</td>
<td>Impotence; Ulcer treatment drug</td>
</tr>
<tr>
<td>Motor Cars</td>
<td>Toyota; BMW</td>
<td>Car design and associated product developments</td>
</tr>
<tr>
<td>Computers and software development</td>
<td>Intel; IBM and Microsoft; SAP</td>
<td>Computer chip technology, computer hardware improvements and software development.</td>
</tr>
</tbody>
</table>

### 2.9 Limitation of the study

Commonly, dimensions of measure such as return on investment, return on equity, return on sales and return on assets are used for measuring the financial returns. But certain non-financial efforts cannot be measured with these financial tools (Zahra, 1993) (Tsai, 2004). In general, the subject to discuss is a continuous process that how to measure innovation. Damanpour (1990) maintained that the strong relation of innovation and performance of the firm based on the criteria of measurement. The traditional orientation is dependent upon the number of research activities (new processes, products or technologies) undertaken by the organization to monitor the level of performance (Hagedoorn and Cloodt, 2003) (Tushman & O'Reily, 1997). Jaumotte and Pain (2005) mentioned that economy is having income on higher side only when it is research-oriented. Usual innovative performance dimensions are R&D spending, the number of patents, number of copyrights, etc. (Alpkan et al., 2005). The five likert scale measurement ranging from unsuccessful to extremely successful may bring in partiality in the responses of executives but are extensive exercise in experimental study (Khazanchi et al., 2007). The main cause to use such scale is
unwillingness on the part of the executive to disclose financial figures (Boyer et al., 1997; Ward and Duray, 2000). Moreover, senior executives are experts in providing exact subjective information needed (Choi and Eboch, 1998). Moreover, objective question restricts the comparison part in answers (Dess and Robinson, 1984; Porter, 1979) (OECD, 2005).

Conversely, a definite quantity of period might be required in order to examine the indication of favourable impact of corporate performance levels. A time gap exists between product innovation and its impact on financial performance (Zahra and Sidhartha, 1993; Teece, 1988; West 1992). This is only reason that senior management always criticize that they do not able to reap the results of innovation. Boston Consulting Group’s Annual Innovation Report (Andrews, 2007) (Boston_Consulting_Group, 2011) subsequently confirmed the top management research about the same concern. However, innovation vestiges an apex tactical focal point for the mainstream organizations and the expenditure on innovation has a rising inclination every year, lot of executives studied-stay unhappy with financial outcomes on their initial investments in the innovation process (Ulrich & Eppinger, 2007) (Ulusoy, et al., 2013).

2.10 Research Gap

The previous researches have not evidently calculated the impact of product innovation on the financial performance of the company. The researches are questionable regarding the impact on long-term financial performance of the company. There are also studies and researchers that focused on the innovation and its effects. There are also researchers that concentrated on impact of innovation forms on the performance of the firm (Gunday; Ulusoy, 2011). McAdam and Keogh (2004) (Urban & Hauser, 1993) focused on the performance of the firm and its knowledge with research and innovation process. Authors also focused on the analysis of major innovations and patents to various corporate performance dimensions such as accounting profitability, growth rates etc. (Geroski, 2005) (Utterback, 1994). There are also studies that discussed about the flow of novel products and its impact on the brand image of the firm in the mindset of the consumer (Metcalf, 1998). (Utterback
& Abernathy, 1975) (Fagerberg et. al (2004) revealed that innovative economies had advanced efficiency and earnings than the fewer innovative ones. Academic research have initiated the innovation research that has been developed and complete by the new study which strived to explain the innovation idea by explaining firm practices, procedures and rules and features wherein firm evaluate their hard work for the generation of novel ideas about goods and services in the market place (Pinchot, 1985; Stevenson and Jarillo, 1990; Hitt, et al., 2001) (Nwokah, et al., 2009) (Valkenburg, 2000). Although there has been no particular research that determines on impact of product innovation on the financial performance of the organizations with respect to Delhi/NCR. Thus, this research focuses to fill the gap by interpreting the impact of product innovation on the financial performance with particular reference to Delhi/NCR.

2.11 Concluding remarks

This chapter includes a literature review present on the researches done to interpret the impact of innovations on the financial performance of the companies with major determination on the Auto business. The research is divided in two separate parts: 1) Interpreting the factors of product innovation and 2) Interpret the effect of product innovation on the financial performance of the organization. There presents diverse opinions on the impact of product innovation on the financial performance of firms. Some researchers conclude that product innovation has positive impact on firms’ financial performance whereas some conclusions are not in favor of product innovation improving financial performance.