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INNOVATIVE PRODUCT DEVELOPMENT PRACTICES IN INDIAN MANUFACTURING INDUSTRY: A REVIEW

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ABSTRACT:

Previous research has highlighted the importance of bringing innovation in New Product Development (NPD) process to achieve success in the market but majority of the research have considered innovation as an element within the NPD process. The integration of innovation along with NPD process is particularly an under-researched subject in the overall NPD research field. Most of the manufacturing organizations strongly believe that more emphasis on NPD is required to keep pace with rapidly growing technology and increased global competition.But our research shows that fundamental issues related to innovative NPD are not yet properly researched keeping in mind the unique needs ofthe developing world, more so particularly in the Indian manufacturing industry.Hence, this study aims to address the NPD best practices and NPD innovation issues together i.e. innovative product development practices in the Indian manufacturing industry.

INTRODUCTION:

New product development (NPD) primarily involves all activities related to translating the potential ideas into a tangible product for market acceptance. There exist broadly two different perspectives into the NPD process: business perspective and engineering perspective. The business perspective of NPD focuses on issues like identifying the potential ideas, analyzing the business scope, and executing the project through coordination with engineering, manufacturing and marketing departments etc. From the engineering perspective, NPD focuses on critical issues like development of concepts, detailed embodiment design, development of virtual and physical prototypes for testing, developing manufacturing plans and resources, quality planning etc. Effective management of both these perspectives in an organization's framework helps develop successful launch of new products into the market place. Traditionally, product design was considered as front end of the NPD i.e. the conceptual phase in which all planning activities took place and product development follows the product design wherein emphasis is given to engineering, manufacturing and quality aspects of the NPD. This approach is simply not true anymore in the present scenario given that there exists collaboration of different NPD activities using NPD cross functional teams, which requires integration of different divisions like industrial design, engineering, manufacturing, sales, and marketing into the product development process right from the ideation to product launch. In this approach, attempts are made to eradicate the difference between product design and product development phases. This approach toNPD with the help of a cross-functional NPD team is one of the most widely cited practices for achieving successful new product development. By this process, better decision can be made by enabling members representing various functional areas to work towards a common goal, instead of following the often conflicting agendas and goals of their individual functional areas.

NEED FOR STUDY:

The Product Development and Management Association (PDMA) conducted three NPD best practices studies (Page, 1993; Griffin, 1997; Barczak et. al., 2009) in the years 1990, 1995 and 2003 respectively to identify the trends in NPD management practices and to discern which practices are associated with higher degrees of success. All the three studies reported that the success rates and development efficiencies have remained stable at around 58%. A study conducted by Information Resources Inc. in 1995 found that 70–80% of new product introductions fail, with each failure resulting in a net loss of up successful in this competitive market. However, it is also argued that such fundamental issues related to integration of innovation in NPD are not yet properly to $25 million. While this data is from the US and accurate failure rate data is not available for India, similar failure rates are likely to occur in India albeit at lower costs (Iyer et. al., 2006). Several previous research have highlighted the importance of bringing innovation in NPD process to get success in the market (Chapter 2) but most of the research have considered innovation as an element within the NPD process. The integration of innovation along with NPD process is particularly an under-researched subject in the overall NPD research field. Most of the manufacturing organizations strongly believe that more emphasis on NPD is required due to rapidly growing technology and increased global competition. Organization's ability to adopt an innovation process that drives the NPD activity in a quick time is an accepted mantra to become addressed by the Indian industry. Hence, there is a need to study the NPD best practices and NPD innovation as organizational issues in the Indian context.

LITERATURE REVIEW:

It is evident from Table 2.1 that majority of the literature reviewed had a focus on reviewing a particular issue in NPD like new product performance (Montoya and Calantone, 1994; Henard and Szymanski, 2001;

Pattikawa et. al., 2006), success factors (Poolton and Barclay, 1998; Ernst, 2002), product positioning and design (Kaul and Rao, 1995), NPD speed (Chen et. al., 2010). Additionally reviews by certain authors can be found addressing issues in product design such as engineering change management (Wright, 1997), decisions in product development (Krishnan and Ulrich, 2001), management practices in product innovation (Guo, 2008) and innovation typology and innovativeness terminology (Garcia and Calantone, 2002). Literature reviews on NPD performance (Montoya and Calantone, 1994; Henard and Szymanski, 2001) were focused on meta-analyses of new product performance determinants. These metaanalyses summarized results of 18 and 60 empirical studies respectively. Both the articles compared the constructs used, tested the contribution of common variables to success, pointed out limitations in the research methods, and suggested future directions for research. Montoya and Calantone, (1994) concluded that new product performance literature content, research methodology, data set characteristics and variable operations are highly diverse and research on new product performance is not highly consistent in terms of which factors are to be included in each study and which statistics are to be reported. On the other hand Henard and Szymanski (2001) discussed about significant and non significant drivers of performance, dominant drivers of performance, breadth of performance drivers and prior emphasis in performance modeling and concluded that giving more emphasis on market place, strategy, and product characteristics than process characteristics is more appropriate for augmenting success levels. Pattikawa et. al. (2006) reviewed new product performance research at the project level by investigating the variables associated with new product project performance. This review was extended toformulate the central tendency and variance in the composition of the variables associated in the form of a correlation coefficient and stated that new product project performance is highly depended on strong market orientation, proficiency in new product development, synergy of resources and strong inter-functional coordination. Two literature reviews (Poolton and Barclay, 1998; Ernst, 2002) can also be found focusing on the identification of the success factors in new product performance. These two reviews summarized the success factors from the past literature and pointed out the limitations in applying these success factors to develop successful products in the market.

RESEARCH GAPS IDENTIFIED:

NPD research has primarily focused on coordinating activities across product design, manufacturing process design, and supply chain design but do not address how to maximize operational, supply chain, and firm performance through this coordination (Rungtusanatham and Forza, 2005). It is observed from the results of NPD research methods that the methodological approach of NPD research is strongly biased towardsquantitative surveys, large samples and extensive statistical analyses. This result is general conclusions without managerial implications that may lead to implementation difficulties. Similar observation was made by Biemans (2003) and the author further reported that many academic journals emphasize on data analysis, leading to articles with only minor sections on managerial implications that only summarize the statistically significant factors, failing to offer practitioners clear clues about how to handle implementation. NPD research worldwide has been seemingly focusing on the industrial sector. The importance of services to the global economy has grown steadily while the importance of goods has declined (Berry et. al., 2006). Both service and product support are increasingly critical elements in the achievement of customer satisfaction and winning new markets (Kumar and Kumar, 2004), hence it is very much imperative to give more attention towards service related issues in NPD. Page and Schirr (2008) also reported that a dramatic increase in research on new service development in the years ahead is long overdue. The same authors further state that both conceptual and empirical analysis of new service development including both qualitative and quantitative techniques should be employed in the effort to understand the unique characteristics of NPD in service sector.

CONCLUSION:

The chapter reviewed 1127 articles on new product development with multiple objectives like growth of NPD research; growth in identified research streams; exploring the NPD research focus towards various issues like of innovation, framework development and performance measurement in NPD research; list and classify the NPD best practices elements and to show the changes and trends over the time period as and when required. This study on NPD research also identifies the sector wise growth in NPD research vis-à-vis industrial, consumer and service sectors. It is observed that many researchers have failed to judge the level of innovativeness in NPD research and in the classified literature more focus was observed towards moderate innovation. An attempt has been made to explore the focus towards framework development in terms of number of articles published and inadequately addressed issues were highlighted. NPD performance issues were dominated by focus towards success factors. Further, reviewed all 781 empirical articles in new product development literature with multiple objectives like purpose of empirical research, level of analysis, country/region studied, sample size, type of respondents and analytical tools used. NPD empirical research have been more focusing on identification and validation of various success factors at program and project level but they do not distinguish between different factor levels i.e. how factors are interrelated and influence NPD success. Researchers are mostly used the case studies and survey methods as an investigative tools and multivariate

statistics as analytical tool to analyze the results. Empirical research in NPD is predominantly performed in developed countries. Therefore, there is a need to evaluate the theory which has been build and verified primarily from developed countries to determine whether such knowledge holds true in developing and undeveloped countries also. Review also revealed important and frequently visited issues in NPD empirical research along with highlighting all the inadequately addressed issues into limelight in the form of significant findings and future directions.

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