Information Management and Business Review
Vol. 3, No. 6, pp. 315-327, Dec 2011 (ISSN 2220-3796)

Innovative Process Management: A Strategic Weapon to Succeed in a Dynamic and Hyper Competitive Environment

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Abstract: Various models have been developed to manage the innovative product development process. However, most of them are complex and add more cost in managing new product development process. In this study, we present a simple and cost effective model of innovative product development process management. The specialty of this model is that it logically demonstrates how integration of encouraging leader and innovative mind in new product development process (NPD) can make it efficient and cost effective. It also shows how leadership can fully concentrate on the first phase of NPD and how cross-functional and innovative teams can be merged in a single team to develop a workable product.

Key terms: *Innovation Process, Innovation Management, Encouraging Leader, Innovative Mind*

1. Introduction

Since the commencement of the industrialization, management experts have been accentuating the significance of innovation for gaining competitive advantage. Business giants such as 3M, BMW, Sony, and GM have built competitive strengths by being innovative and continuously concentrating on innovation (Singh, Sharma, & Singh, 2007). Managing innovation adds value to the organization (Goyal & Pitt, 2007). Hyper-competitive environment within which businesses operate made it necessary for firms to understand and adapt to innovation (Johannessen, Olesen, & Lumpkin, 2001). "Innovation can be systematically managed if one knows where and how to look" (Drucker, 1998). However, it is an elongated and complex process involved series of organizational decision-making (Urabe, 1988, p.3). The question is how to make this innovation process shorter and how to reduce number of activities and decisions and the resulting cost of these activities and decisions? Utterback (1971) developed a three-stage model of innovation process to be used in new product development. By adding cost and time aspect Mansfield et al. (1971) proposed a five-stage model of innovation process. Twiss (1980) advanced the innovation process model and proposed the activity stage model containing alternative paths. Bohinc and Erichsen (2002) developed five step model innovation processes with several accompanying parallel steps. Ali, Muhammad, and Park (2011) presented a "spiral model of indigenous technological innovation capabilities" explaining how organizations initiate, imitate, improve and make innovative technologies in developing countries. All of these models are complex in nature and none of them addressed how to make innovative process cost effective simpler. By keeping the significance of innovation and innovation management in view especially in the context of today's dynamic and hyper-competitive market environment, this article presents a three stage innovative product development process management model. It demonstrates that how innovation process can be shortened and costs can be reduced by reducing the number of activities and managerial decisions involved in it.

The innovative process management model proposed in this article makes some significant contributions. First, it integrates the role of encouraging leader in the innovative product development process. Encouraging leader is generally known as transformational leader. Transformational leadership encourages followers to perform beyond the expressed expectations of the top leadership and management of the organization (Bass, 1985). Second, it demonstrates how transformational leader would be able to fully concentrate on the first stage of innovative product development process. Leaders' concentration on only first stage would result in the saving of his thinking, time and managing cost. Incorporation of encouraging leader in the innovative product development process is essential, as leadership is a critical constituent to the success of a business

firm operating in today's dynamic environment (Hitt & Ireland, 2002; Davies & Davies, 2004). Transformational leadership influences the employees' adaptive performance at both individual and team levels positively (Charbonnier-Voirin, Akremi, & Vandenberghe, 2010). Adaptive performance can be defined as the "employees' ability to work creatively, learn new skills, and adapt to diverse social contexts and new environments" (Charbonnier-Voirin & Akremi, 2011). Third, important advancement this model makes is the cohesion of cross-functional and innovative teams in a single team known as "innovative mind". Innovative Mind consists of "Analytical Mind", Creative Mind", & "Technical Mind". The focus of the Cross-functional teams is usually within the organizational walls and innovative teams look beyond the organizational walls (Pitta, Franzak & Katsanis, 1996). The role of innovative mind is vital in the successful completion of an innovative product development process. The job of the innovative mind in the innovative process is to develop a workable creative concept that is the base of innovative product. We propose that Innovative mind should only consist of relevant experts from most important departments of the organization because relevant and moderate diversity in innovation teams reduce the time cost. Teams consisting of increased diversity leads to more disagreements (Jehn, Northcraft, & Neale, 1999). Increasing disagreements among team members incurs the time cost, makes resource allocation difficult, contributes to the frustration and dissatisfaction of the team members and hampers the innovation (Amason & Schweiger, 1994). Moderate diversity in teams helps in benefiting from all members' divergent ideas and opinions because of the "increase in decision making capacity" (Chi, Huang, & Lin, 2009).

All the members of innovative mind are the specialists from the three important departments of the organization who directly influence the new product development decisions of the organization. Creative Minds from marketing department, Innovative minds from production department and Analytical Mind from finance and other functional department. Participation from research and development, marketing and production is critical for the success of the new product development outcome (Brown & Eisenhardt, 1995; Ilori, Oke, & Sanni, 2000). We proposed the market scanning team to update them about customer needs and changing trends would support that creative mind. Market scanning team looks beyond the walls of the organization. "Fit with market needs" is a critical factor for the result-oriented outcome of the new Product development process (Poolton & Barclay, 1998). The model presented in this article explains how same teams, which are the part of innovative mind, can be allocated at three different stages of new product development process (NPD) instead of developing new teams. The moderate diversified teams lead to the least chances of conflicts among the teams operating at different stages of the NPD and reduce managing cost. The purpose of this paper is to present a simplest but detailed conceptual model that would guide managers and organizations to plan, implement and manage the innovative product development process successfully. First section of this paper presents literature review on innovation, innovation process, innovation process management and role of leadership in innovation process management. Second section of this paper presents the proposed model of innovative process management. Third, section presents discussion and fourth section contains managerial implications and conclusion and future directions.

2. Literature Review

Innovation: In general, innovation is thought to be a crucial factor behind the corporate success (Cardozo et al., 1993). Innovation is conceptual as well as perceptual and successful innovators apply both right and left-brains (Drucker, 1998). It can be a novel thought, thing or behavior, which is dissimilar from prevailing practices (Barnett, 1953, p. 7). It can also be defined as the implementation of original ideas, processes products, or services (Thompson, 1965). Innovation is not a single variable rather it is complex process consisting of various critical variables (Becker & Whisler, 1967). In innovation, both research and development and innovation processes are managed systematically. These innovative processes can be used for the development of innovative product and organizational innovation (Kelly & Kranzburg, 1978). New ideas once created are implemented into a new product, process or service. Innovation is not a one-time activity but the result of elongated and cumulative process of an abundant number of organizational decisions making processes ranging from the new idea generation to its implementation phase (Urabe, 1988, p.3). In innovation, knowledge is transformed into original, relevant and valued new products, processes or

services (Luecke & Katz, 2003). It is the change in thought process of an individual, group or organization in performing tasks and applying discovery based new inventions (McKeown, 2008). "Innovation is an application that has commercial value" (Srinivasan, 2011). After reviewing the literature on the concept of innovation, we proposed a new definition of innovation. Innovation is a novel solution to satisfy the needs of the target market or it's an unconventional way to deliver existing solution to target users.

Innovation Process: The process of innovation encompasses three stages i.e. "Idea generation and its sub-process"", Problem solving and its "sub-process", "Implementation" and "diffusion and its sub-process" (Utterback, 1971). By incorporating cost and time, dimensions in three-stage innovation process Mansfield et al. (1971) proposed a five-stage model of innovation process. By advancing the Innovation process, model a step forward Twiss (1980) developed the activity stage model consisting of alternative pathways that might lead to success or failure of innovation process. Twiss (1980) further explained his model with the "conversion process model" and a "market pull model"._Pushed process is grounded on existing or new technology whereby organizations attempt to find the useful applications to use this technology. Whereas, in pulled process organizations attempt to identify the unmet needs of the customers and direct their efforts to find required solution to satisfy the identified customer needs (Trott, 2005). Bohinc & Erichsen (2002) developed an innovation process model, which encompasses five key steps, and many parallel steps accompany these steps. Innovation process involves multiple phases whereby organizations transform ideas into new or improved products, services or processes.

Purpose of innovation process is to compete and differentiate in market place in a successful mode (Baregheh, Rowley, & Sambrook, 2009). Innovation process contains six steps. It begins with an idea and ends up with after sales service. In innovation process, ideas are searched and selected, explored and synthesized in a rhythmic manner .i.e. cycles of divergent thinking followed by convergence (Leonard & Sensiper, 1998). A systematic innovation process consists of a number of phases and stages, which connect "planned business processes from business opportunity identification to technology details to cross-industry application exploitation of newly developed technology/tools/products" (Sheu & Lee, 2011). The success of a new product depends on of how the activities used in the new product development process are linked and how well they are implemented (Cooper & Kleinschmidt, 1986). Necessary activities of NPD process include assessment of ideas, implementation of technical and consumer related feasibility studies and examination of launching strategies (Ernst, 2002). After reviewing exiting literature of innovation process, we propose that innovation process is the set of interdependent but sequential activities to develop a workable creative concept, convert it into an innovative product and deliver it to the target market by using compatible communication and distribution strategies.

Innovation Management: Innovation management is the invention and implementation of management practices, structures, processes which are novel and may assist business organizations to attain their goals effectively (Birkinshaw, Hamel, & Mol, 2008). It is a set of tools that managers apply to pursue common goals and process. It directs organization to respond to opportunities available in internal and external environment and exploit its energies to introduce new ideas in the form of processes or products (Kelly & Kranzburg, 1978). Creative management involves creation of new idea, outlining new directions, and development of new methods of operation. Innovative management attempts to implement creative ideas and drive the organization effectively in new directions (Kuhn, 1993). "Innovation can be systematically managed if one knows where and how to look" (Drucker, 1998). For successful management of technological innovation it is necessary that innovators should be in contact with the scientific as well as with their own community. Secondly, the resources should be assigned to different departments of the organization through scientifically knowledgeable individuals who can think across the departmental boundaries or through cross-departmental committees, whose members exchange information on their respective needs freely. Exchange of information among committee members lead to the generation of divergent but lucrative ideas. Third, they give equal attention to functional expertise and customer experience in order to create an innovative product (Henderson, 1994).

The development of a new (innovative) product involves mixture of inputs such as "technical expertise"", consumer information"", creative ideas" and "comprehensive systems" for combing these inputs into marketable product. To collect consumer inputs organizations usually conduct customer surveys, apply monitoring systems, develop cross-functional teams and market scanning groups. Furthermore, they arrange meetings between product developers and sales personnel on regular basis and increase staffing diversity. Companies set specific guidelines to combine the inputs effectively. Furthermore, innovative organizations reward their people for successful attempts and do not penalize them for taking risks that lead to business failure (Craig, 1995). In turbulent environment firms shortly, develop the products if their processes of new product development are flexible. In flexible product development, process many steps of the process are repeated (Iansiti, 1995). For Innovation, organization should ensure the availability of resources. Secondly, it should develop shared cooperative processes and structures so that problems are resolved creatively and innovations are linked to the current businesses of the organization. Moreover, organization needs to integrate the innovation in its business strategy (Dougherty & Hardy, 1996).

If organizations want managers to create and maintain creative and innovative organizational culture then they should provide the facilitating working conditions to them. Organizations should ensure that managers set goals and researcher find ways to achieve them. Secondly, firm should emphasize personalized awards. Third, managers of innovative units should focus on the group's progress to achieve the innovation. Fourth, firms should ensure the continuity in innovation process by consistently providing required resources to their scientists (Judge, Fryxell, & Dooley, 1997). Firms should encourage employees to produce divergent views and approaches to problem solving (Nemeth, 1997). Larger firms usually face five major dilemmas at different phases of innovation process. First, they have plenty of ideas and need mechanisms to identify best ideas, which would reduce risk. Second, they have to choose from experienced and inexperienced (young and enthusiastic people) for new ventures. Third, they have to decide whether to assign new venture job to internal staff or hire externals. Fourth, they have to decide whether alliance with external firms or build internal capacity. Fifth, they have to decide whether make small-scale product launch or large-scale launch (Sharma, 1999).

Abernathy and Clark (1985) proposed elements of innovation competence i.e. "Design of technology, Production systems, Skills (labor, managerial, technical), Materials, Capital equipment, Knowledge and experience base, Relationship with customer base, Customer applications, Channels of distribution and service, Customer knowledge and Modes of customer communication". Six factors are considered critical for attaining creative outcomes. Those factors are "diversity of input condition", "Discovery of novel linkage conditions", "Directing all efforts on well-defined problem", "Challenging traditional perspective condition", deviation from status quo and promoting risk taking condition" and "resource availability condition for implementation" (Sethi, Smith, & Park, 2001). After reviewing existing literature on innovation management, we propose that innovation management is the managerial approach or technique of directing innovation process in a result-oriented mode by utilizing available organizational resources.

Role of Leadership: Strategic leadership behaviors are positively influence innovation processes. Strategic leadership behaviors influence both product-market and administrative innovation of an organization (Elenkov, Judge, & Wright, 2005). Leadership is a critical constituent to the success of a business firm operating in today's dynamic environment (Hitt & Ireland 2002; Davies & Davies 2004). In today's competitive and dynamic environment, it is essential for strategic leaders to utilize their energies in motivating, inspiring and empowering the work force at all levels and departments of the organization (Dess & Picken, 2000). Christensen (1997, p.143) defines strategic leadership as "a person's ability to anticipate, envision, maintain flexibility, think strategically, and work with others to initiate changes that will create a viable future for the organization". Organizational leadership is the ability of an individual to influence, motivate and facilitate others to contribute to the effectiveness and success of the organization to which they belong (Dorfman & House, 2004). Top leadership of an organization should encourage new developments. Encouragement by top management stimulates a sense of challenge and opportunity in employees of the organization to be creative (Kuhn, 1993). To encourage innovative developments in an organization a leader

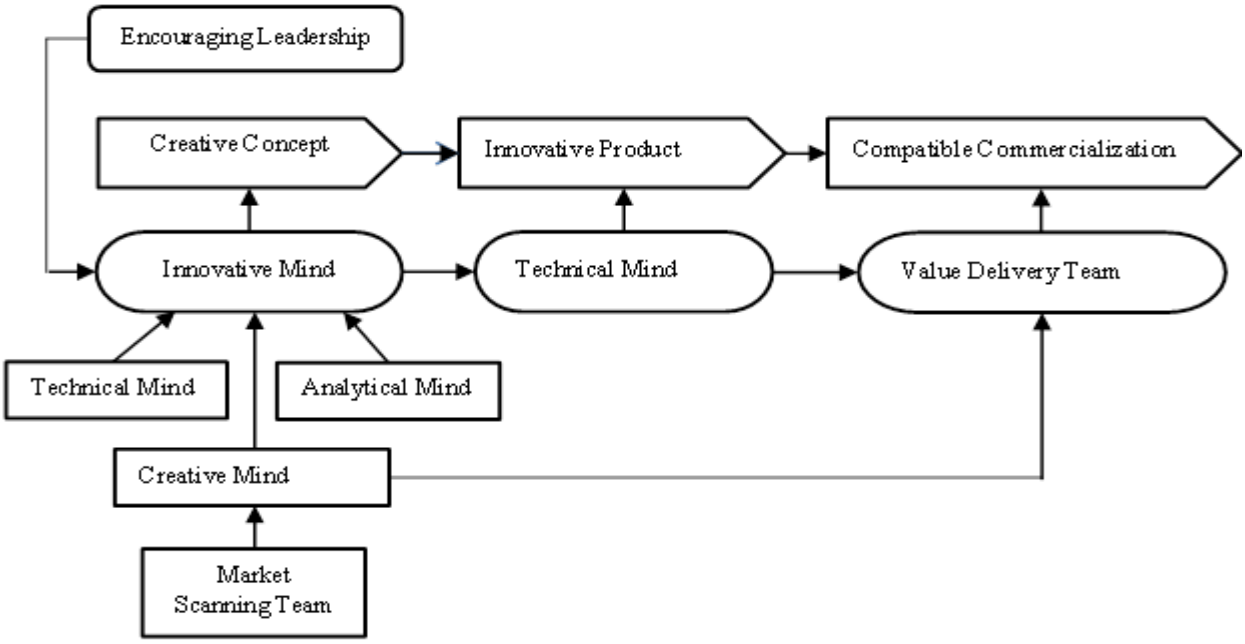
needs to give followers sufficient freedom to create new ideas and try novel approaches but at the same time a leader needs to exert a certain amount of control to ensure that the novel ideas and approaches actually leads to workable innovations (McDonough & Leifer, 1986). Such leadership is known as transformational leadership. Transformational leadership encourages followers to perform beyond the expressed expectations of the top leadership and management of the organization (Bass, 1985).

The best thing about the transformational leadership is that it positively influences the employees' adaptive performance at both individual and team levels (Charbonnier-Voirin, Akremi, & Vandenberghe, 2010). Adaptive performance can be defined as the "employees' ability to work creatively, learn new skills, and adapt to diverse social contexts and new environments" (Charbonnier-Voirin & Akremi, 2011). Encouraging leadership creates the favorable climate for innovation and this environment leads to employees' adaptive performance (Charbonnier-Voirin et al., 2010). Similarly, leader, member- exchange (LMX) of information on needs and developments and supervisors' coaching of employees' positively influence their performance. However, this impact depends on the followers' perception of the leader whether he is doing it for employees' interest or for self-interest (Sue-Chan, Chen, & Lam, 2011). Transformational leaders positively influence individual employees as well as their teams and organizations. Transformational leaders lead not only their individual followers but also their teams and organizations to realize advanced levels of performance (Wang et al., 2011). Contrary to transformational or encouraging leadership is the aversive leadership that uses aversive methods such as punishment, reprimand, and intimidation to influence followers or employees (Yun, Cox, & Salam, 2007). Aversive leadership negatively affects the creativity of employees (Choi, Anderson, & Veillette, 2009). Leadership is a key driver of creating preferences for innovation in an organization by providing training, resources and encouraging employees to generate new things (Amabile, 1997). Supportive organizational environment and leadership are positively related to the subordinate's innovative behavior (Scott & Bruce, 1994). Because of exiting literature on leadership and innovation management one may conclude that the role of encouraging leader in innovative process management is very important as he works as a driving force.

3. Conceptual Modeling

Innovation process involves three stages (Utterback, 1971). By adding cost and time aspect Mansfield et al. (1971) proposed a five-stage model of innovation process. Twiss (1980) advanced the innovation process model and proposed the activity stage model containing alternative paths that might lead to success or failure of innovation process. According to Bohinc and Erichsen (2002), innovation process encompasses five key steps and many parallel steps accompany these steps. Organizations adopt innovation process to advance, compete and differentiate themselves successfully in their marketplace (Baregheh et al., 2009). This study proposes a three-phase model of innovative process based on encouraging leadership and innovative mind. This model advances that how encouraging leadership, which is usually known as transformational leadership and innovative mind, can help organization to attain the favorable outcomes of innovative product development process (IPDP). The incremental contribution of this model is that it explains how managing costs at different stages of new product development process (NPD) can be reduced. The proposed idea is presented in figure 1.

Figure 1: Proposed Model of Innovative Process Management



The first step of innovative process is "Creative concept" which is the core of the innovative product. The "Innovative Mind" develops this Creative concept. Innovative Mind is a cross functional team consisting of "Analytical Mind", Creative Mind", and "Technical Mind". Analytical Mind consists of experts from finance & accounts, Purchasing & HR. Creative Mind consists of experts from marketing and Technical Mind consists of experts from Designing, Engineering (production). The focus of the Cross-functional teams is usually within the organizational walls. While innovative teams look beyond the organizational walls (Pitta, Franzak & Katsanis, 1996). Innovative mind generates such a creative concept, which fulfills the requirements of both internal and external environments of the organization. The purpose of gathering these three minds under the umbrella of innovative mind is to develop such a creative concept that is practically feasible for organization to realize. For instance, the best ideas ever created by marketing may not be realized because of financial constraints, unavailability of required materials. Similarly, unmatched technical expertise may thwart the realization of a Creative Concept. Social cohesion (Janis, 1982) and functional diversity (Milliken & Martins, 1996) may lead to the emergence of novel and innovative ideas. Innovation is the outcome of collective action and mutual understanding of looking at thing from various perspectives (Dougherty, 1992). What kinds of the skills a team leader possess determine the success and effectiveness of the team (Clark & Wheelwright, 1993)? Its members would choose the managing leader of the innovative mind. Usually team leader must possess high status within the organization, should be creative and practical, be good at resolving conflicts, be good communicator and have the understanding of all the functional departments of the organization. Furthermore, he/she must have the marketing, designing, manufacturing, and financial skills (Brown & Eisenhardt, 1995).

"Market Scanning Team" would support the Creative mind. The job of the Market Scanning Team would be gathering of market intelligence and conducting of market research to detect new market opportunities. All the organization collect the information about trends, events, opportunities and threats in their marketing environment through market scanning, direct experience and so forth (Day, 1994). Frequent interaction and communication among members of Innovative Mind is inevitable for generation of a workable Creative Concept. Communication is critical in organizations for connecting employees and permitting organizations to function (Downs, 1988; Hargie, Dickson, & Tourish, 1999). Frequent interactive and open communication among members of the Innovative Mind is also important to ensure the equal participation by all the

members. Participation has an effect on both satisfaction and productivity (Miller & Monge, 1986). Communication and participation of individuals are inevitable factors in innovation (Johnson et al., 2001).

Once the Innovative Mind finalizes the Creative Concept, the second phase of the innovative process takes place where innovative product is developed by the Technical team based on the Creative Concept generated by the Innovative Mind. At product development, stage product concept is developed into a physical form so that it is ensured that the product idea is transformed into a marketable product (Huang, 2010). At the innovative product, development stage where creative concept is converted into physical form technical mind will face any problem, as they are part of innovative mind. At idea generation stage technical mind share their view that what idea is technically possible for organization. So only that idea is a finalized which technical mind approves. In this way, chances of those costs reduce which may incur at second stage of NPD if production department refuse to work on the creative concept, which is generated in, faze one. Technical mind informs the other members of the innovative mind about the progress of innovative product that takes place at product stage. This again stresses on the importance of interactive and frequent communication among the members of innovative mind. Members of a new product development team need to communicate with each other so that product development activities are accomplished properly (Sosa et al., 2002). Intensive communication system leads and integrates people and makes the project successful (Laufer, Denker, & Shenhar, 1996).

After the Technical Team develops Innovative Product based on Creative Concept it is then handed over to the Value Delivery Team. The job of the Value Delivery Team is to devise a compatible commercialization/product launching strategy so that desired outcomes of the innovative product will be achieved in the dynamic and hyperactive competitive marketing environment. Value Delivery Network encompasses a number of player such as suppliers, company and its employees, distributors etc. who create and offer value in the form of output (product or service) to the target customers (Mentzer, 2001). Final phase of the innovative product development involves both the marketing launch plan and the operations plan (Cooper, 1990). Market entry is a critical factor in commercializing a new product (Kotler et al., 2009). Internal human and technology sources of a company are imperative for the successful commercialization of the new technology. Furthermore, external environmental factors and forces are of vital importance for successful commercialization (Zahra & Nielsen, 2002). Commercialization is that stage where the outcome of innovative product development process is made available to the target market to satisfy a certain set of needs-this is a very critical stage. Product launching phase may be one of the major financial investments made by a firm (Guiltinan, 1999). The front-end of the innovative management process is the critical and uncertain phase, but it determines the destiny of a new product (Beard & Easingwood, 1996; Guiltinan, 1999). Mishandling here can shadow the completely innovative effort. "This block includes the attributes and advantages of the new product, its price, the nature of the launch efforts, the production effort underlying the launch. The commercial entity is the result of the new product process" (Cooper, 1979). Again, value delivery team would not face in developing the compatible commercialization strategy, as they are part of the Creative Mind. What innovative product is feasible to commercialize is already discussed at first stage of NPD. Through innovative mind, creative mind will inform top leadership about the market performance of the innovative product.

Leadership is a key driver of creating preferences for innovation in an organization by providing training, resources and encouraging employees to generate new things (Amabile, 1983). Generally, encouraging leader is known as transformational leader. Transformational leadership has the positive impact on the employees' adaptive performance at both individual and team levels. Furthermore, transformational leader creates encouraging and favorable environment for employees to create innovative solutions (Charbonnier-Voirin et al., 2010). We advanced that the role of encouraging leader is critical in running and achieving the successful outcome of the innovation based new product development process. Transformational leaders positively influence individual employees as well as their teams and organizations and encourage them to realize advanced levels of performance (Wang et al., 2011).Which is a critical constituent to the success of business firm operating in today's dynamic environment (Hitt & Ireland, 2002; Davies & Davies, 2004). In our

proposed model, we suggest that the role of encouraging leader is to encourage, facilitate and guide the innovative mind only. The simple reason is that innovative mind consists of all those teams that handle innovative product development at later stages of the NPD.

In this way, transformational or encouraging leader needs only to concentrate at the back-end process of the NDP. Result would be the saving of managing and time cost of teams at the central and front-end processes of new product development. In other words, leader needs to stimulate a sense of challenge and opportunity in employees of the organization to be creative (Kuhn, 1993) only at the first phase of the innovative process. A leader needs to give followers sufficient freedom to try novel approaches but at the same time a leader needs to exert a certain amount of control to ensure that the novel ideas and approaches actually leads to workable innovations (McDonough & Leifer, 1986). Similarly, leader does not need to supervise the front-end process separately as value delivery team who is responsible for the commercialization of the innovative product is the part of creative mind and creative mind is the part of innovative mind. The role of leader is to interact with innovative mind only. Again, the result would be the saving of time and managing cost. In our proposed model, the role of leader is concentrated at one place only as opposed to the previous studies where leader is supposed to concentrate at different levels and departments of the NDP. For instance, Dess & Picken (2000) suggested that it is essential for strategic leaders to utilize their energies in motivating, inspiring and empowering the work force at all levels and departments of the organization. One of the prime responsibilities of leader is to ensure the participation, interaction and communication among all the members of the innovative mind so that innovation is achieved smoothly and served to target market in time. Exchange of information among committee members from different departments of the organization lead to the generation of divergent but lucrative ideas that lead to successful product innovation (Henderson, 1994).

4. Discussion

This paper introduces a three-phase model of innovative process management focusing on the role of encouraging leadership and cross-functional teams. In the model, cross-functional team is introduced with a new name i.e. innovative mind. This model assumes the role of innovative mind as the foundation of product innovation and innovative process. Development of a workable creative concept, which is the base of an innovative product, is possible only if analytical mind, creative mind and technical mind are combined under the umbrella of innovative mind. For instance, the best ideas ever created by marketing may not be realized because of financial constraints, unavailability of required materials etc. Similarly, unmatched technical expertise may thwart the realization of a Creative Concept. Social cohesion (Janis, 1982) and functional diversity (Milliken & Martins, 1996) may lead to the emergence of novel and innovative ideas. Under the umbrella of innovative mind, it would be possible for the team to develop such a creative concept that is financially, technically and from other organizational perspectives feasible to produce. This emphasizes the importance of social cohesion of organizational members from different functional departments for a successful innovation. Purpose of social cohesion here is not to direct the group thinking and to force the group members on a single idea that is liked by leader but to see what idea is workable within the given organizational resources and constrains. Group thinking can be seen as a process by which team or group members try to maintain a shared positive opinion of the functioning of the group in the face of threat (Turner et al., 1992, p. 789). Group cohesion and productivity are positively related (Evans & Dion, 1991). The social cohesion of different people from different functional departments under the umbrella of innovative mind will help them to easily and properly work on the innovation when it would be transferred to their respective departments at different stages of new product development. Furthermore, more it would reduce the cost of conflict and confusion among different teams handling the product development at different stage of the process, as these teams are the part of the innovative mind. Therefore, innovative mid would finalize only that idea which creative mind, technical mind and analytical mind approves at the first stage of the NDP.

Innovative mind can create result oriented ideas and solutions only if top leadership encourages it. Second important component and contribution of this proposed model is the integration of leadership in the

innovative process management. The leader drives the train on the long railway line. Leadership is a key driver of creating preferences for innovation in an organization by providing training, resources and encouraging employees to generate new things (Amabile, 1997). In our model, we call such a leader as encouraging leader who is usually termed as transformational leader in the existing literature. Encouraging leadership or transformational leader creates the favorable climate for innovation and this environment leads to employees' adaptive performance (Charbonnier-Voirin et al., 2010). We propose that transformational leader needs to only concentrate on innovative mind as all the teams operating at the latter two stages of the NDP are the part of innovative mind. Therefore, leaders' facilitation at the first stage or back end process would automatically facilitate the people handling the central and front-end processes. The major benefits of combing creative mind, technical mind and analytical mind under the umbrella of innovative mind are (1) only workable ideas would be finalized hence reducing the chances of product failure in the market, (2) leader's concentration would not be divided among the teams operating at different stages of NDP rather he/she would be able to fully concentrate only on a mega team (innovative mind) operating at back end process of NDP. It would reduce the managing and time cost of the leader. Leadership is a critical constituent to the success of a business firm operating in today's dynamic environment (Hitt & Irelandm, 2002; Davies & Davies, 2004). Leadership stimulates a sense of challenge and opportunity in employees of the organization to be creative (Kuhn, 1993). However, traditional leadership cannot perform this job. Several studies such as Charbonnier-Voirin et al. (2010) and Wang et al. (2011) stated that transformational leadership motivates the individuals and team to generate novel ideas and solutions and create favorable environment for the innovation.

To exchange what innovation in the product is possible within the available resources, constraints interaction, and frequent informal and formal two-way communication among and participation by all components of innovative mind is inevitable. Interaction among team members helps them to freely exchange the needs and requirements of their respective departments and generate divergent but lucrative ideas (Henderson, 1994). Communication is critical in organizations for connecting employees and permitting organizations to function (Downs, 1988; Hargie et al., 1999). Communication and participation of individuals are inevitable factors in innovation (Johnson et al., 2001). One of the essential roles of the transformational leader in innovative process management is to ensure that all constituents of the innovative mind are equally participating, frequently communicating and interacting with each other. Communication can work as a mechanism of mutual understanding, pleasant relationships and advance cooperative decision-making (Griffin & Hauser, 1996). To keeping the innovation process on track and smooth leader needs to give followers sufficient freedom to try novel approaches but at the same time a leader needs to exert a certain amount of control to ensure that the novel ideas and approaches actually leads to workable innovations (McDonough & Leifer, 1986).

Managerial Implications: Although this paper is conceptual in nature, however it has some important implications for practitioners. First, this paper explains why organizations need to combine experts from marketing, production, finance and other functional departments in a single team at the first phase of the new product development process. Social cohesion helps to see what idea is workable within the given organizational resources and constrains. This finding inferred from the discussion is supported by the findings of Evans and Dion (1991) that group cohesion and productivity are positively related. The best ideas ever created by marketing may not be realized because of financial constraints, unavailability of required materials etc. Similarly, unmatched technical expertise may thwart the realization of a creative concept. Social cohesion (Janis, 1982) and functional diversity (Milliken & Martins, 1996) may lead to the emergence of novel and innovative ideas. Under the umbrella of innovative mind, it would be possible for the team to develop such a creative concept that is financially, technically and from other organizational perspectives feasible to produce. Second, the proposed model explains how organization can reduce the cost of managing teams at different levels of the new product development process. The social cohesion of different people from different functional departments under the umbrella of innovative mind will help them to easily and properly work on the innovation when it would be transferred to their respective departments at different stages of new product development. Furthermore, it would reduce the cost of conflict and confusion among different

teams handling the product development at different stage of the process, as these teams are the part of the innovative mind. Therefore, innovative mind would finalize only that idea which creative mind, technical mind and analytical mind approves at the first stage of the NDP. Third, the proposed model clearly explains that if transformational leader is assigned to fully concentrate on the innovative mind (cross-functional team) at the first stage of the NDP it could result in the successful outcome of the NDP. Transformational leader has the positive impact on the innovative performance of the individuals and teams. Such encouraging leadership motivates the individuals and team to generate novel ideas and solutions and create favorable environment for the innovation (Charbonnier-Voirin et al., 2010; Wang et al., 2011). Fourth, the proposed model suggests that transformational leader must ensure that all the members of the innovative mind are equally participating, frequently communicating and interacting with each other. Communication deficiency between the marketing, R & D, manufacturing and other functional departments of a company can be enormously harmful to the NDP process (Schilling & Hill, 1998). Communication and participation of individual members of the team are inevitable factors in innovation (Johnson et al., 2001).

5. Conclusion

This article presents a three-stage model of innovation process management backed by the transformational leadership and innovative mind (a cross-functional team). This proposed model emphasizes that first phase of the new product development (NDP) is the base of the successful outcome of the innovation. Therefore, it explains how top leadership of the organization would be able to full concentrate on the first phase of the NDP. Second, it demonstrates how cohesion of experts from different functional departments of the organization in innovative mind can reduce the managing and other costs at product development and commercialization stages of the NDP. Future research should examine the cohesive impact of the transformational leadership and the innovative mind on the outcome of the NDP. Furthermore, future research should test the impact of combining creative, technical and analytical minds on the overall cost reduction of the NDP.

References

Abernathy, W. J. & Clark, K. B. (1985). Innovation: Mapping the winds of creative destruction. *Research Policy*, *14*, 3-22.

Ali, M., Muhammad, A. & Park, K. (2011). A spiral process model of technological innovation in a developing country: The case of Samsung. *African Journal of Business Management*, 5(7), 2874-2889.

Amabile, T. M. (1983). The social psychology of creativity. New York: Springer-Verlag.

Amabile, T. M. (1997). Motivating creativity in organizations: On doing what you love and loving what you do. *California Management Review, 40*(1), 39-58.

Amason, A. & Schweiger, D. M. (1994). Resolving the paradox of conflict, strategic decision-making and organizational performance. *International Journal of Conflict Management, 5,* 239-253.

Baregheh, A., Rowley, J. & Sambrook, S. (2009). Towards a multidisciplinary definition of innovation. *Management Decision*, 47(8), 1323–1339.

Barnett, H. G. (1953). Innovation: the basis of cultural change. New York: McGraw-Hill.

Bass, B. M. (1985). Leadership and performance beyond expectations. New York, NY: Free Press.

Beard, C. & Easingwood, C. (1996). New product launch: Marketing action and launch tactics for high technology products. *Industrial Marketing Management, 25*, 87-103.

Becker, S. W. & Whisler, T. L. (Oct. 1967). The innovate organization: A selective view of current theory and research. *The Journal of Business, 40*, 462-469.

Beswick, C. & Gallagher, D. (2010). The road to innovation. UK: LTB Publishing.

Bohinc, T. & Erichson, J. (2002). Innovations management. *Telecommunication*, *56*(7+8), 1-59.

Birkinshaw, J., Hamel, G. & Mol, M. J. (2008). Management innovation. *Academy of Management Review*, *33*(4), 825-845.

Brown, S. L. & Eisenhardt, K. M. (1995). Product development: Past research, Present findings, and future directions. *Academy of Management Review, 20*(2), 343-378.

Cardozo, R., McLaughlin, K., Harmon, B., Reynolds, P. & Brenda, M. B. (1993). Product market choices and growth of new businesses. *Journal of Product Innovation Management, 10*, 331-340.

Charbonnier-Voirin, A. & Akremi, A. E. (2011). The Effect of Empowerment on Employees' Adaptive Performance. *Relations Industrielles/Industrial Relations*, 66(1), Available at SSRN: http://ssrn.com/abstract=1802719

Charbonnier-Voirin, A., Akremi, A. E. & Vandenberghe, C. (2010). A multilevel model of transformational leadership and adaptive performance and the moderating role of climate for innovation. *Group & Organization Management,* 35(6) 699–726.

Chi, N. W., Huang, Y. M. & Lin, S. C. (2009). A double-edged sword? Exploring the curvilinear relationship between organizational tenure diversity and team innovation: The moderating role of team-oriented HR practices. *Group & Organization Management*, 34(6) 698–726.

Cooper, R. G. (1979). The dimensions of industrial new product success and failure. *Journal of Marketing,* 43(3), 93-103.

Cooper, R. G. (1990). Stage-gate systems: A new tool for managing new Products. Business Horizons, 44-54.

Cooper, R. G. & Kleinschmidt, E. J. (1986). An Investigation into the New Product Process: Steps, Deficiencies, and Impact. *Journal of Product Innovation Management,* 3, 71-85.

Choi, J. N., Anderson, T. A. & Veillette, A. (2009). Contextual inhibitors of employee creativity in organizations: The insulating role of creative ability. *Group & Organization Management,* 34 (3), 330-357.

Christensen, C. M. (1997). Making strategy: Learning by doing. *Harvard Business Review,* 75(6), 141-156.

Clark, K. B. & Wheelwright, S. C. (1993). Managing new product and process development. New York: Free Press.

Craig, T. (1995) Achieving Innovation through bureaucracy: Lessons from the Japanese brewing industry. *California Management Review, 8*(1), 8-36.

Davies, B. J. & Davies, B. (2004). Strategic leadership. *School Leadership & Management,* 24(1), 29-38.

Day, G. S. (1994). The capabilities of market-driven organizations. *Journal of Marketing*, 58(4), 37-52.

Dess, G. G. & Picken, J. C. (2000). Leadership in the 21st century. *Organizational Dynamics,* 5(2), 18-33.

Dorfman, P. W. & House, R. J. (2004*).* Cultural influences on organizational leadership: Literature review, theoretical rationale, and globe project goals, in House, R.J., Hanges, P. J., Javidan, M., Dorfman, P. W. and Gupta, V. (Eds.), Culture, Leadership, and Organizations*: The GLOBE Study of 62 Societies*, Sage, Thousand Oaks, pp. 51–73.

Dougherty, D. (1992). Interpretive barriers to successful product innovation in large firms. *Organization Science, 3*(2), 179-202.

Dougherty, D. & Hardy, C. (1996). Sustained product innovation in large, mature organizations: Overcoming innovation-to-organization problems. *Academy of Management Journal*, *39*(5), 1120-1153.

Downs, C. W. (1988). Communication audits. Glenview: Scott Foresman IL.

Drucker, P. F. (1998). The discipline of innovation. Harvard Business Review.

Elenkov, D. S., Judge, W. & Wright, P. (2005). Strategic leadership and executive innovation influence: AN international multi-cluster comparative study. *Strategic Management Journal,* 26, 665–682.

Ernst, H. (2002). Success factors of new product development: a review of the empirical literature. *International Journal of Management Reviews,* 4 (1), 1–40

Evans, C. R. Dion, K. L. (1991). Group Cohesion and performance: A meta-analysis. *Small Group Research*, 22(7), 175-186.

Goyal, S. & Pitt, M. (2007). Determining the role of Innovation: Management in facilities management. *Facilities,* 25 (½), 48-60.

Griffin, A. & Hauser, J. R. (1996). Integrating R&D and marketing: a review and analysis of the literature. *Journal of Product Innovation Management,* 13, 191- 215.

Guiltinan, J. P. (1999). Launch strategy, launch tactics and demand outcomes. *Journal of Product Innovation Management, 16*(6), 509–529.

Hargie, O., Dickson, D. & Tourish, D. (1999). Communication in management. Gower, Aldershot.

Henderson, R. M. (1994). Managing Innovation in the Information Age. *Harvard Business Review,* 72(1), 100-106.

Hitt, M. A. & Ireland, D. R. (2002). The essence of strategic leadership: Managing human and social capital. *Journal of Leadership & Organizational Studies,* 9(1), 3-14.
Huang, Y. (2010). A study of product innovation in new product development process. *International Bulletin of Business Administration,* 9, 64-73.
Iansiti, M. (1995). Shooting the rapids: Managing product development in turbulent environments. *California Management Review*, 38(1), 37-58.
Ilori, M. O., Oke, J. S. & Sanni, S. A. (2000). Management of new product development in selected food companies in Nigeria. *Technovation, 20*(6), 333-342.
Janis, I. L. (1982). Group thinks. Boston: Houghton Mifflin.
Jehn, K. A., Northcraft, G. B. & Neale, M. A. (1999). Why differences make a difference: A field study of diversity, conflict, and performance in groups. *Administrative Science Quarterly*, 44, 741-763.
Johannessen, J. A., Olesen, B. & Lumpkin, G. T. (2001). Innovation as newness: what is new, how new, and new to whom*? European Journal of Innovation Management, 4* (1), 20-31.
Johnson, J. D., Donohue, W. A., Atkin, C. K. & Johnson, S. (2001). Communication, involvement and perceived innovativeness: Tests of a model with two contrasting innovations. *Group & Organization Management, 26*, 24-42.
Judge, W. Q., Fryxell, G. E. & Dooley, R. S. (1997). The new task of R&D management: Creating goal-directed communities in R&D units. *California Management Review.* 39(3), 72-85.
Kelly, P. & Kranzburg, M. (1978). Technological Innovation: A Critical Review of Current Knowledge. San Francisco: San Francisco Press.
Kotler, P., Keller, K. L., Koshy, A. & Jha, A. (2009). Marketing Management: A South Asian Perspective 13th Ed. New Delhi: Pearson Education.
Kuhn, R. L. (1993). Generating Creativity and Innovation in Large Bureaucracies. Westport, CT: Quorum Books.
Laufer, A., Denker, G. R. & Shenhar, A. J. (1996). Simultaneous management: the key to excellence in capital projects. *International Journal of Project Management*, *14,* 189-199.
Leonard, D. & Sensiper, S. (1998). The Role of Tacit Knowledge in Group Innovation. *California Management Review, 40*(3), 112-125.
Luecke, R. & Katz, R. (2003). Managing creativity and innovation. Boston, MA: Harvard Business School Press.
Mansfield, E., Rapoport, J., Schnee, J., Wagner, S. & Hamburger, M. (1971). Research and innovation in the modern corporation. London. W. W. Norton & Co.
McDonough III, E. F. & Leifer, R. P. (1986). Effective control of new product projects: The Interaction of organization culture and project leadership. *Journal Product Innovation Management,* 3, 149-157.
McKeown, M. (2008). The truth about innovation. London: Prentice Hall.
Mentzer, J. T. (2001). Supplier partnering, (Sheth and Parvatiyar Ed.), Handbook of Relationship Marketing. Sage.
Miller, K. I. & Monge, P. R. (1986). Participation, satisfaction and productivity: A Meta analytical review. *Academy of Management Journal,* 29(4), 727-753.
Milliken, F. J. & Martin, L. L. (1996). Searching for common threads: Understanding the multiple effects of diversity in organizational groups. *Academy of Management Review,* 21(2), 402-23.
Moss, S. E., Sanchez, J. I., Brumbaugh, A. M. & Borkowski, N. (2009). (2009). The mediating role of feedback avoidance behavior in the LMX–performance relationship. *Group & Organization Management,* 34(6) 645–664.
Nemeth, C. J. (1997). Managing innovation: When less is more. *California Management Review,* 40, 59-74.
Pitta, D. A., Franzak, F. & Katsanis, L. P. (1996). Redefining new product development teams: learning to actualize consumer contributions. *Journal of Product & Brand Management*, 5(6), 48-60.
Poolton, J. & Barclay, I. (1998). New product development from past research to future applications. *Industrial Marketing Management,* 27(3), 197-212.
Schilling, N. A. & Hill, C. W. L. (1998). Managing the new product development process: Strategic Imperatives. *Academy of Management Executive,* 12(3), 67-81.
Scott, S. G. & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal, 37*(3), 580-607.

Sethi, R., Smith, D. C. & Park, C. W. (2001). CROSS-functional product development teams, creativity and the innovativeness of new consumer products. *Journal of Marketing Research,* XXXVIII, 73–85.
Sharma, A. (1999). Central dilemmas of managing innovation in large firms. *California Management Review,* 41(3), 146-164.
Sheu, D, D. & Lee, H-K. (2011). A proposed process for systematic innovation. *International Journal of Production Research*, 49(3), 847-868.
Singh, G., Sharma, R. & Singh, S. (2007). Managing innovation for competitive advantage: An integrated approach model. *Indian Management studies Journal,* 11, 161-169.
Srinivasan, S. K. (2011). From jugaad to systematic innovation: the challenge for India. *Information Management and Business Review,* 2(1), 46-47.
Sue-Chan, C., Chen, Z. & Lam, W. (2011). LMX, coaching attributions, and employee performance. *Group & Organization Management,* 36(4) 466–498.
Thompson, V. A. (1965). Bureaucracy and innovation. *Administrative Science Quarterly,* 10(1), 1-20.
Trott, P. (2005). Innovation Management and new product development. Prentice Hall. ISBN- 0273686437.
Turner, M. E., Pratkanis, A. R., Probasco, P. & Leve, C. (1992). Threat, cohesion and group effectiveness: Testing a social identity maintenance perspective on groupthink. *Journal of Personality and Social Psychology, 63*, 781-796.
Twiss, B. (1980). Managing Technological Innovation. London: Longman.
Urabe, K. (1988). Innovation and the Japanese management system. In K. Urabe, J. Child, & T. Kagono (Eds.), Innovation and management international comparisons. Berlin: Walter de Gruyter.
Wang, G., Oh, I. S., Courtright, S. H. & Colbert, A. E. (2011). Transformational leadership and performance across criteria and levels: A meta-analytic review of 25 years of research. *Group & Organization Management,* 36(2), 223–270.
Zahra, S. A. & Nielsen, A. P. (2002) Sources of capabilities, integration and technology commercialization. *Strategic Management Journal,* 23, 377–398.