INNOVATE TO GET AHEAD IN TURBULENT TIMES

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Introduction

Business environment is changing and the changes are mostly cited as unfavorable by the majority. The ability of organizations to respond such changes to ensure profitability and growth in a sustainable manner has become a challenging task and it is often seen as a test of leadership. It is argued that innovation, speed and flexibility are the new winning factors in business shifting price, quality and delivery just qualifying factors. In spite of changing customer demands, shorter product life cycles, rapid evolution of technologies, increasing competition and changing regulations, it is very important for banks to promote innovations to get ahead.

Having said that innovations are vital for business firms it is essential for managers to influence the innovation process in the organization. However, due to lack of understanding most practicing managers tend to think innovations are accidental and the innovation process as a black box. Based on an ongoing doctoral research by the author this article describes in detail the term innovation and attempts to explain the process of innovation suggesting a new model to promote innovations within the organizations.

What is innovation?

Innovation involves the creation of a product, service or a process that is new to an organization. It is the introduction into the market place, either by utilization or commercialization, of a new product, service or process. It does not have to be new to the world rather; it is viewed as the first use of an idea within an organization (Aiken & Hage, 1979) whether or not the idea has been adopted by other organizations already (Nord and Tucker, 1987). The technology (or the product) need not be novel or groundbreaking. An innovation may be a change in industrial practice, which improves productivity such as use of a new ICT solution in deposit mobilization or debt collection.

Innovation has become a key determinant of competitiveness and growth of nations, regions, clusters and firms (Morrison et al, 2006). Innovations are widely accepted as a key factor receiving attention of stakeholders. Being innovative has become one of the most important factors for

organizations in sustaining their competitiveness (Tidd et al; 2002). According to Utterback (1994) innovation is a life or death ingredient for firms. Managing the innovation process within firms from idea generation to successful commercialization demands a comprehensive understanding of the various stages of the process, determinants and best practices of successful organizations.

Cooper (1999) presents four drivers of product innovation namely intensified customer needs, shorter product life cycles, technological advances and increasing world competition. These drivers will continue to be important, at least in the near future (Galanakis 2006).

Tidd et al. (1997) add to this argument, that even the largest firms face the fate of disappearing if they do not prepare radical innovations for the next generation of products and markets. They observe that almost 40% of the firms that made the Fortune Top 500 in the 1980s have disappeared, whilst of the 1970s list, 60% have been acquired or gone under. The destiny of small firms may be even worse as they lack the protection that a large firm, with a large resource base (capital) can offer.

The innovation process involves integration of existing technology and inventions to create a new or improved product, process or system (Jain and Triandis, 1990). In realty, the innovation process is complex, non linear, iterative and they include the elements of randomness (Schoen et al. 2005). Innovation management concerns management of all activities in the process from idea generation to successful commercialization.

Innovation types

Innovation is mostly regarded as the commercial and practical application of ideas or inventions (Trott 2005). Innovations are classified by the type and perceived degree of novelty (Tidd et al. 1998). Schumpeter who cited innovations as the stimuli for economic development defined innovations as inventions commercialized by entrepreneurs (Schumpeter 1934). He classified innovations into process innovations and product innovations. Innovations imply change. The degree of novelty indicates whether an innovation is incremental or radical. Most innovations are incremental as they build on existing knowledge and provide small improvements (Tidd et al. 1998).

There are many different types of innovations such as product, process, organizational, management, production, service and commercial (Trott 2005). However, this article will focus only on technological innovations namely product innovations and process innovations and the scope would adequately cover the innovations and its process relevant to the banking industry.

The term technology means the processes by which an organization transforms labor, capital, materials and information into products or services. The term innovation refers to a change in technology (Christensen et al, 1996). Technology is also defined as a process, technique or methodology –embodied in a product design or in a manufacturing or a service process- which transforms labour, capital, information, material and energy into outputs of greater value. Building upon the work of Sahal (1981) Christensen defines a technological change –which he describes

as innovation- as a change in one or more of such inputs, processes, techniques, or methodologies that improves the measured levels of performance of a product or process. Technology defined in this way is specific to particular products or processes (Christensen, 1992).

In studying different types of technological innovations the work of Henderson and Clark (1990) is important where they suggest a conceptual framework to distinguish four types of innovations namely incremental innovation, modular innovation, architectural innovation and radical innovation. Incremental innovation introduces relatively minor changes to the existing product, exploits the potential of the established design, and often reinforces the dominance of established firms. Radical innovation, in contrast, is based on a different set of engineering and scientific principles and often opens up whole new markets and potential applications. Innovations that change the way in which the components of a product are linked together, while leaving the core design concepts (and thus the basic knowledge underlying the components) untouched are classified as architectural innovations (Henderson & Clark, 1990). It would be interesting for the readers to examine the innovations in the banking industry during the recent past and classify them. It would show the trends and who are competent in what in your own industry.

Almost all innovation theorists agree that innovations happen in different degrees of novelty (Mutlu and Er, 2003). The degree of novelty vary from minor, incremental improvements to radical changes that totally change the way a product is perceived or a process is held in an industry (Tidd et al., 2001).

Incremental innovations are needed to meet changing market demands. It is also required to emphasize on radical innovations to ensure long term survival by reinventing the business and market models. Schumpeter described radical innovations that would discontinue existing technologies as creative destruction. Utterback (1994) suggests temporary dominance in the market place by such innovators.

Rothwell and Gardiner (1988) connect the importance of incremental innovations to the high rates of technological change. According to them, during periods of high rates of technological change, there exist relatively few radical innovations in each industry. Once a radical innovation is introduced to the market, it leads to various incremental innovations, and major or minor re-design variations developed on the radical innovation.

Innovation within an established industry is often limited to incremental improvements of both products and processes. Major product change is often introduced from outside an established industry and is viewed as disruptive; its source is typically the start of a new small firm, invasion of markets by leading firms in other industries or government sponsorship of change either as an initial purchaser or through direct regulation (208 pp, Burgelman et al, 2004). Various products classified under financial disintermediation, banking services offered by mobile phone operators are examples relevant to banking industry to show that disruptive changes are introduced from outside. Existing models of innovation process neither explain adequately any reasons for this behavior nor recommend any methodologies to promote innovations.

Researchers have traditionally focused on single dimensions of innovation such as technology (Etlie, 2000) organization (Damanpur, 1991) or market related issues (Hargadon and Sutton, 2000). Therefore, non availability of a consolidated view drew attention of researchers for a more integrated approach in order to better understand the internal organizational activities, the sequence of the activities in innovation process, market and environmental influences and managerial issues affecting the ability of companies to innovate (Cooper, 1998; Frambach, 1993; Rothwell, 1994). There appears to be a better understanding of the innovation process from an integrated perspective (Bernstein and Singh, 2006).

Innovations in banking industry

A Deloitte study of the global financial services industry suggests most consumers do not really care about new products. Their top three priorities are (1) responsive service, (2) being valued as a customer and (3) convenience/ ease-of-use. Products are not a key criteria or a differentiator; they are simply commodities that competitors can quickly and easily replicate.

Successful banks are likely to embed innovation to the very fabric of the organization -from strategy and processes to people, systems and business partners- actively developing good ideas to enduring commercial success. It is important to understand that financial institutions with tired products will lose market share in the long term. There are many examples of financial institutions growing share from innovative products; but the reason for this success is the strong linkages between the product improvements and service and process innovation (Gentle et. al, 2005).

When it comes to product innovation, it is important to achieve parity. Unfortunately, some financial institutions have become so obsessed with product innovation that they neglect everything else particularly process and service innovation. As a result, they are unable to differentiate themselves from the competition and fail to establish a lasting advantage. Although it may seem counterintuitive, step-change revenue improvements come from internal innovation, not external products. Most financial service companies do not focus much attention on process and service innovations, making it easier for those that do to achieve differentiation and competitive advantage. Since process and service innovations generally occur behind the scenes, they are harder for competitors to detect and replicate – providing an advantage that is much more enduring (Gentle et. al, 2005).

Superior performance is first achieved by "locking-in" customers for positive reasons such as service innovation, then using that captive base of happy customers to generate additional revenue. There are two main levers to achieve that kind of growth:

• Process innovation – which focuses on the way work is done, making it better, faster and cheaper. Examples include value chain re-engineering, performance-based incentives, and sales force effectiveness.

• Service innovation – which focuses on the customer experience, bringing a company closer to its customers and using that intimacy to deliver better service.

Every company expects to develop a breakthrough product that will give it an unassailable advantage in the marketplace, but the truth is such innovations are few and far between. In fact, some experts argue the last major product innovation in financial services was the credit card, introduced by Barclays Bank all the way back in 1966. Other product innovations such as debit cards, affinity cards, balance transfers and electronic bill payment were merely variations on the theme. Whether or not you agree with that argument, there's no denying that truly disruptive product innovations are exceedingly rare in the banking industry. They're likely to become even less common as financial markets mature, and as financial institutions increasingly rely on standard technology platforms and third-party outsourcing (Gentle et. al, 2005).

In recent years, the biggest disruptions in financial services have come from process and service innovations. Off-shoring is a disruptive process innovation that is literally changing the way financial services companies are structured. The internet has become an important service channel that continues to grow in size and importance. Service offerings traditional to banks yet packaged with state of the art technologies by mobile telephone operators signal a disruptive innovation that can change the competitive landscape of the entire banking industry unless converged and offered collaboratively. This phenomenon supports the findings of Burglemen et.al. (2004) explained earlier in this article.

Innovation models

A model that can help practicing managers to better understand the various stages of the innovation process and the determinants of innovation at each stage is quite useful for them to influence the process and promote innovations. In this article existing innovation models are described with the objective of introducing a new innovation model in the end that could be used by the bankers to promote both product and process innovations in their work places.

Although there are several models that describe various stages of the innovation process such models lack proper segregation of stages and their complexity often makes managers take a decision, the outcome of which contradicts their original aims (Galanakis, 2006). Divergence of research results make it so that the innovation process is poorly understood (Becheikh et al, 2006). Further those research studies have not attempted to investigate in depth the determinants and factors that can influence the process in each stage. Impact of such factors has been mostly examined considering the whole process (Bernstein & Singh, 2006).

Innovation and its commercialization is a complicated process. In recent years, many studies have shown that the level of investment in research and development are increasing significantly. But numerous barriers to innovation are prevalent throughout idea to market process. Much has been stated about the R & D as a whole, but very little has been said about how to help individual innovators overcome the barriers to commercialization (Bandarian, 2007).

Linear and non-linear models on innovation process

The studies on the theory of innovation suggest innovation to be a 'process', but there is no agreement about the nature of this process (Mutlu and Er, 2003). The early studies of the innovation process, conducted mostly in the 1950's and 1960's, proposed a simple unitary progression of phases or stages in the development of products. These models were presented as simple linear sequential events focused on research and development activities (Bernstein and Singh, 2006).

Basic research, applied research and development and commercialization, collectively, make up a structure referred to as the linear model of innovation. This model has also been referred to as the 'assembly-line model', 'pipeline model', 'ladder model' and the 'bucket model' (Mahdjoubi, 1997). The major shortcomings in explaining innovations using the linear model as per Mahdjoubi are lack of a common definition for R&D, confining technological innovation to R&D, lack of attention to design and production, lack of attention to feedbacks, incremental innovation and reverse engineering, using the expenditure on R&D as an input proxy for innovation and the assumption that technology always follows science.

Saren (1984) describes two early models of the product innovation process; the department based view and the activity based view. In the department based view an idea is transformed to a new product through many departments namely R&D, design, engineering, production and marketing. In the activity based view idea generation follows screening, commercial evaluation, technical development, testing and commercialization. The activity based view is a quite useful approach towards a more practically useful innovation model where idea generation, synthesizing such ideas with existing knowledge and commercial evaluation are identified as important stages. Testing indicates a sense of modifications after receiving feedback.

Bruce Archer (1971) published a six-stage model of the product innovation process and inside the stages he placed different steps. Archer did not start with a product idea or an ideation stage, but was one of the first scholars to introduce the idea that product design has to fit within the corporate strategy of a firm. His model is one of the first integrated product innovation models. The six stages are strategic planning, research, design, development, manufacturing / marketing start-up and production. Although the model is useful from a learning perspective it has limited uses for a practicing manager or an academic learning how to promote innovations.

The basic design cycle introduced by Roozenburg (1977) also provides a practical explanation to the innovation process. The stages identified are analysis, synthesis, simulation and evaluation. Although idea generation is not identified as an initial and vital step in the innovation process this model emphasizes synthesis and simulation as the second and third stages of the process. The major weaknesses observed in this model include (a) no emphasize on idea generation, and (b) identification of evaluation as the final stage where evaluation is an integral step of all the stages.

A step by step innovation model was introduced by Innovation Consulting Group in 1978 which has four stages namely strategy formulation, design brief formulation, product development and product launch/use (Buijs, 2003).

The divergence and convergence in the innovation process have been discussed in the Roozenburg and Eekels (1995) model where they divide the total innovation process into four stages namely; policy formulation, idea finding, strict development and realization. This model too lacks how ideas are synthesized with existing technologies and the importance of leveraging same with organizational resources and capabilities. The model emphasizes the importance of feedback from the end users in further developments.

The number of stages in the innovation process also differs from one model to the other. Although there is no hard and fast rule to limit the stages to a particular number anything above five will be difficult to remember. Further, when practicing mangers are attempting to make use of these models a large number of stages or steps can be a discouraging factor. An easily understandable few stages which can cover the total process comprehensively will have more acceptability.

It is interesting to learn that some of the innovation models having very high number of activities elaborated as high as 54 and the obvious end result could be rejection by practicing managers. Van der Zee (2003) in an analysis of the reasons for differentiating product innovation processes made a comparison between 90 different innovation models from all over the world. He found out that in total more than 1,248 different terms were used to describe specific innovation activities which he converged to a set of 54 (Buijs, 2003).

Rothwell (1992) suggests five generations of innovation models originated with linear process models.

The technology push theory

These theories known as first generation theories are grounded on research of Schumpeter (1934) which assumes a linear process where it begins with inventions and ends with innovations resulting monetary profits (Varjonen, 2006). He states that technological innovations introduced through new products and processes lead to economical development (Schumpeter 1934). His view of the innovation process is linear: it begins with inventions and ends with innovations with monetary profits (Schumpeter 1934). These ideas form the foundation for the linear technology push model (figure 1), also known as the science push model (Roberts 1998).

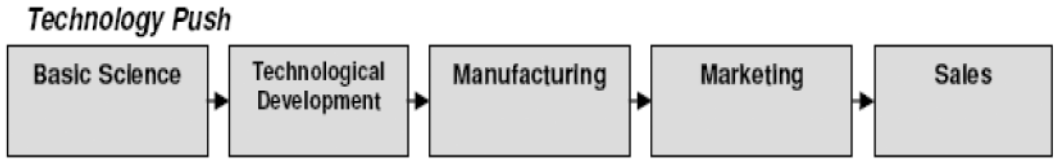

Figure 1

The market pull theory

The views of Schmookler (1996) which suggests demand forces within markets pull the innovation process led to the second linear model of market pull theory which is also known as the demand-led model (Roberts 1998). These second generation innovation models challenge the Schumpeterian linear technology push model. According to the studies of Schmookler (1966), demand forces within markets pulled the inventions and the innovations. The views of Schmookler and others led to the second linear model the market pull model of innovation (figure 2), which is also known as demand-led model (Roberts 1998).

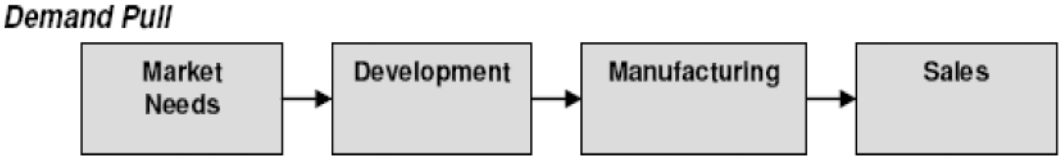

Figure 2

The coupling innovation process theory

During 1970's the coupling model was introduced which is described as the third generation innovation model. This model suggests that the innovation process of simultaneous coupling of R&D, manufacturing and marketing (Trott 2005) A simultaneous coupling model, the third generation innovation model, was created during 1970s, when many studies showed that the innovation process was much more complex than previous linear models had described (Trott 2005, Figueroa & Conceicao 2000). The simultaneous coupling model suggests that the innovation process is the result of simultaneous coupling of knowledge within all three functions: R&D manufacturing and marketing (Trott 2005).

The functional integration theory

The core feature of this approach is functional integration around a project in order to combine the expertise of the different specialists; to reduce the completion time and to reduce the rework needed at later stages (manufacturing and marketing) of the process (Imai et al., 1985).

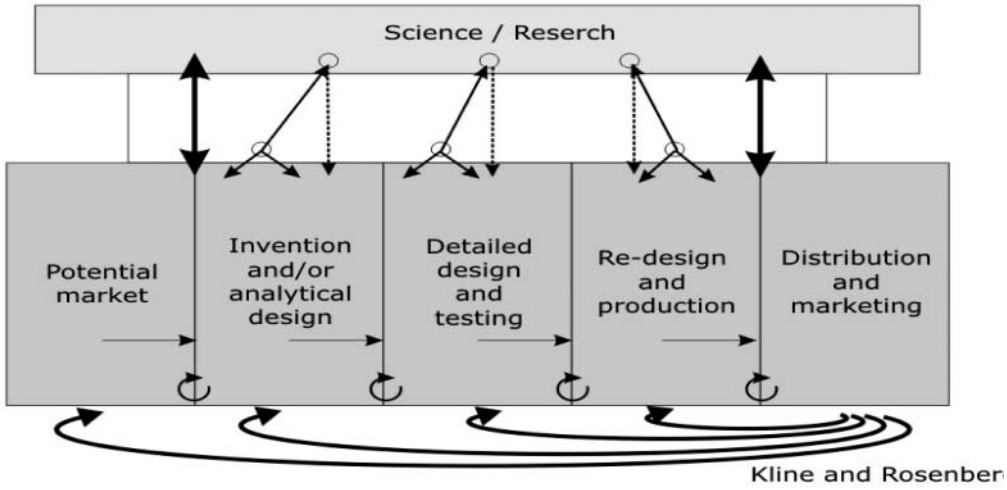

Figure 3

The interactive model of innovation considered as the fourth generation innovation process model (also known as the chain-link model presented by Kline and Rosenberg shown in Figure 3), is a modification of the previous linear models and combines both the technology push and the market pull views (Rothwell & Zegveld 1985). It also contains similar elements as the simultaneous coupling model (Kline & Rosenberg 1986). The model is a logically sequential – though not necessarily continuous – process that can be divided into functionally distinct but interacting stages (Rothwell & Zegveld 1985). Although this interactive model resembles the linear models, the flow of information is not necessary linear. There are complex links and feedback relationships within the company and also between the company and the surrounding science - technology system (Roberts 1998). The generation of ideas is based on three basic components: organization capabilities, needs of the market, and science and technology. The overall process is complicated and through efficient management firms will be able to create successful innovations. (Trott 2005, Rothwell & Zegveld 1985).

The systems integration and networking theory

These are also known as fifth generation theories. This model emphasizes the necessity of effective management of the innovation process due to complexity and uncertainties. This is based on the fourth generation process but highlights the need for continuous change. The innovation process involves new electronic tools such as simulation, CAD/CAM and rapid prototyping, to aid the design and development stages (Galanakis 2006).

The new product development or the NPD process is the process of transforming business opportunities into tangible products. It can be regarded as a sub process of the innovation process

starting after the early phases of the entire process. Even though they are sometimes considered being the same process, the difference can be seen in that the innovation process has unsystematic and fuzzy early stages during the idea and concept development, whereas NPD is more systematic in nature (Varjonen, 2006). However, this statement contradicts with some of the definitions given to the term innovation where it is identified as a deliberate activity and not as accidental.

The network models are the most recent thinking concerning the NPD process (Varjonen, 2006). Linear NPD models help to understand the phases in the process, but NPD process needs to be viewed as a simultaneous and concurrent process with cross-functional interaction (Trott 2005). The NPD network models emphasize the external linkages coupled with the internal activities, and they also underline the most important areas of the management of the NPD (Trott 2005). The four internal activities identified in the model are marketing and sales, finance, engineering and manufacturing and R&D.

In the stage-gate model of Cooper and Kleinschmidt (1993) the innovation process is divided into five phases from the preliminary assessment of an idea to its commercialization (Figure 4). After every stage there is a gate deciding to continue or terminate the project. The stage-gate-model integrates the market and technological perspective (Verworn et al, 1999). Activities are performed in parallel and decisions at the gates are made within cross-functional teams. The steps between these points can be viewed as a dynamic process. Stage-gate divides this process into a series of activities (stages) and decision points (gates) (Cooper, 2006).

One of the major advantages of process models is the systematization of the often ad hoc development. The process is transparent for all departments and a common understanding can be developed. This eases communication in teams as well as with top management. Empirical studies (e. g. Cooper 1996) show that firms using a well executed stage-gate process are more successful than firms without a systematic approach. Cooper (1994) developed a further so called third generation stage-gate model to make the process more flexible. The phases are fluent with fuzzy gates. Nevertheless, a lack of flexibility due to the sequential approach is often criticized (Verworn et al., 1999). Despite the empirical evidence in support of this model the author believes that the linear nature of the model underestimates its importance. For an example, the initiative for an innovation might take place when a product is at its testing stage. Therefore, suggesting a sequential and linear process itself discourages innovations and hinders the opportunity for a better process/ product in the end.

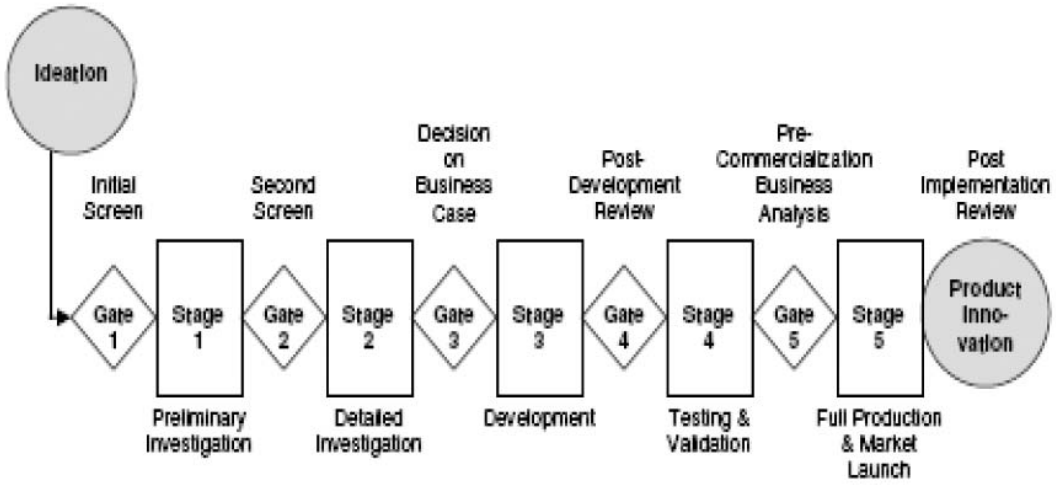

Figure 4: Stage-gate model of Cooper and Kleinschmidt (1993)

The "fuzzy front end" ranges from the generation of an idea to either its approval for development or its termination (Murphy and Kumar 1997). There are several process models for the early phases existing (e. g. Cooper 1988, Murphy and Kumar 1997). Khurana and Rosenthal (1998) define the front end "to include product strategy formulation and communication, opportunity identification and assessment, idea generation, product definition, project planning, and executive reviews" (Verworn et al., 1999).

Another technology based innovation model cited in the research paper of Varjonen (2006) is a technology commercialization framework introduced by Jolly (1997), where each stage add value to the technology (Figure 5). The activities in this innovation process constitutes of five sub processes involved in bringing the new technology to market: imagining, incubating, demonstrating, promoting and sustaining. The readers may emphasize the applicability and/or relevance of the concept in banking industry in various products and processes although the framework is meant for technology commercialization signaling restrictions in uses in other areas. These sub processes are more or less the same as in the linear view of innovation: basic research, applied R&D, product development and engineering, marketing, and incremental R&D. Jolly (1997) links these sub processes with bridges, which take the stakeholder satisfaction into account. These bridges underline the importance of stakeholder management in the innovation process. The framework also includes the concurrent and iterative view of technology and market exploration. (Jolly,1997). The second stage 'incubating' suggests synthesize of an imagination with available knowledge and technologies. The next stage 'demonstrating' shows how the idea can be leveraged through the next stage of 'promoting'.

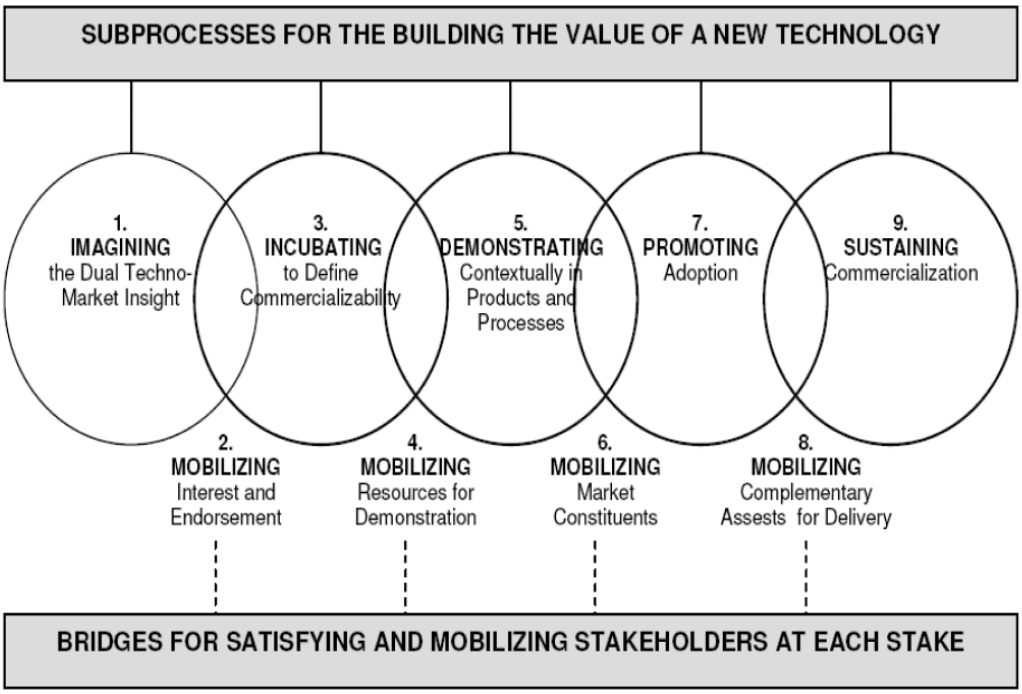

Figure 5: Technology Commercialization Framework by Jolly (1997)

The innovation process can be regarded in many companies as a core business process with generic activities associated with survival and growth (Tidd et al. 1998). The process of innovation management has been described by them with the following 4 essential management activities in a linear sequence with a feedback loop.

- Scanning the external and internal environment,
- Strategy and decision-making,
- Resource management,
- Implementation of technical and relevant market development

In addition, learning from these activities builds organizations knowledge base and improve the innovation process management. Innovations vary and thus different contexts and circumstances lead to many different solutions. Despite these variations the underlying pattern of the phases in the innovation management remains constant. These phases are cyclical and repeated during the innovation process. (Tidd et al, 1998). This supports the idea of Nieto (1996) where he suggests that both the input and output of the innovation process is technology which has a stock magnitude and the innovation process has a flow magnitude.

The technological innovation process model suggested by Varjonen (2006) has five phases

containing activities such as research, development, product development, market launch, and growth and sustainability. Each activity reaches for a defined and acceptable result.

Circularity in modeling the innovation process gained popularity equally as there have been many studies attempting to suggest non linear models. Visualizing the innovation process as a circular model suggests that there is neither beginning nor end. This is particularly true as after introducing a new product in the market as a result of a product innovation process, the successful use of the product will lead to reaction of competitors which will cause changes in the product or new innovation to regain the competitive advantage (Buijs, 2003).

The Chain–Linked model by Stephen Kline is one of the most cited non-linear innovation models. Kline argues that the Chain-Linked model is consistent with a detailed evaluation of the nature of technology, the concept of innovation, and the failures of a simple linear model which are often assumed, and the necessity that the linear model be replaced with a more complex model in order to understand the nature of innovation. The Chain-Linked method emphasizes the socio-technical nature of industry and technology and the necessity to look at it as a complex system. In the model the first path of innovation process, central chain-of-innovation, begins with design and continues through development and production to marketing. The second path is a series of feedbacks (Mahdjoubi, 1997).

In the Chain-Linked model, the general process starts with a market-finding phase followed by design, production, marketing and distribution, and use phases. It differs from the linear model in a number of ways: there are multiple paths from which innovations may arise and many forms of feedback. Research is not normally considered to be the initiating step (in fact, research occurs in and contributes to all phases in the innovation process), and the primary source of innovation is now held to be stored knowledge and technological paradigms.

Ralph Gomory developed the circle model of innovation as an alternative to the linear model that he calls the Ladder model. John Alic argues that the Circle approach, compared to the linear model, gives equal weight to technical virtuosity in all of the functions - research, design, production, and marketing – and produces a model that stresses the importance of close coupling among them (Mahdjoubi, 1997).

Innovating firms without the requisite manufacturing and related capacities may die, even though they are the best at innovation (Teece, 1986). Firms competing in today's markets can be at a great disadvantage in failed innovation attempts or innovations introduced without paying attention to the leveraging stage. When the firm is not capable to implement highlighting the possible innovations to the industry can lead competitors to take advantage. There are many examples from the domestic banking industry also to prove this point where the pioneering firms have failed to retain the first mover advantage.

Through the grounded theory approach to data analysis, Bernstein and Singh (2006) developed a basic innovation process model consists of four distinct and identifiable stages, beginning with

idea generation, then innovation support, innovation development and finally innovation implementation (Figure 6). They identified four organizational constructs, management, communication, structure and control, that seemed to play a pivotal role in the innovation process that are linked to each stage of the innovation process. They provided evidence to show that each of these constructs played a different role in each of the innovation process stages resulting in a complex interaction of factors which are both internal and external to the organization.

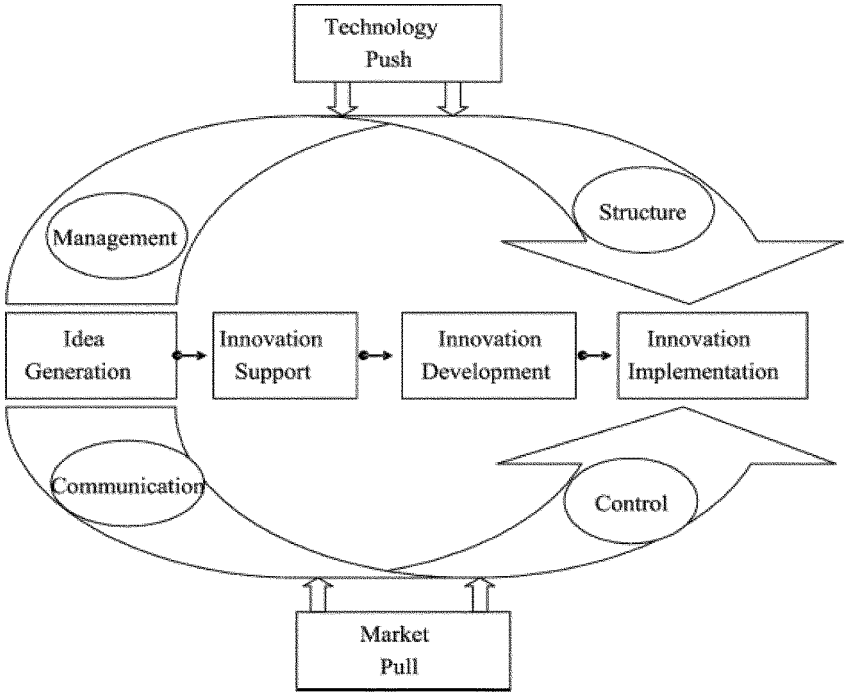

Figure 6: Innovation Process Model by Bernstein & Singh (2006)

The two disparate mechanisms of market pull and technology push are also brought in to the model. Although the very first stage of idea generation is clearly identified and discussed in this model the subsequent stages lack practical insights. For an example innovation support and innovation development do not make any sense to a practicing manager. Further, the authors have not taken any attempt to further describe those subsequent stages to make the model practically useful and academically rigorous.

Although the subject study states that the conventional stage models have failed to go beyond the idea generation there is no significant explanation to the other stages in this model as well. This model is built on existing knowledge in the integrated approach to innovation. For empirical support it relies on 9 biotechnology companies. Bernstein and Singh (2006) also

emphasized the importance of tacit knowledge in the innovation process. How and when organizational resources and capabilities are evaluated in the process is not clear in this model.

Integrating determinants of innovations to process models

An ideal innovation process model that can be used by practicing managers to influence and promote innovations should integrate the determinants into each stage of the process appropriately. Although the early models lack integration of internal and external factors the subsequent models have addressed this. In developing an integrated model it is important to identify the key determinants of innovation which is equally important as the identification of the stages. Importance and appropriateness of various determinants of innovation can obviously vary at the different stages of the innovation process.

A major shortcoming of existing models that have incorporated internal and external factors influencing the innovation process is their failure to identify and prioritize the various factors that are appropriate to different stages. The market forces will have a major impact in the ideation stage but may not be at the same level in the subsequent stages of the process. Similarly vertical communication channels will be very important in certain stages of the process. As such, in developing a useful innovation model it is of utmost importance to identify the most influential determinants at each stage rather than just identifying them as equally important across the process.

The systematic review of empirical studies on innovation by Becheikh et al, 2006 describes determinants of innovation in manufacturing firms using 108 empirical studies carried out between 1993 and 2003. In this systematic review the authors have identified over forty internal determinants concerning the characteristics of innovating firms. With a view to draw up a comprehensive and instructive overall picture of these variables those determinants have been grouped to seven main categories of internal variables, namely those related to: (1) the general characteristics of the firm, (2) its global strategies, (3) the structuring of its activities, (4) control activities, (5) the firm's culture, (6) its top management team, and (7) its functional assets and strategies. In developing the integrated innovation model strategy, structure, culture and leadership could be considered as the important internal determinants which can influence the innovation process.

The subject review of research articles has also brought up approximately twenty contextual determinants of innovation. They include variables related to the physical or institutional environment to which the company belongs. In order to better examine these variables they have been segregated in to 6 groups according to; (1) the industry to which the firm belongs, (2) the region where it is located, (3) networking relations with various actors of its environment, (4) the acquisition of knowledge and technologies, (5) government and public sector policies, and (6) the surrounding culture. The framework for integrating innovation findings is shown in Figure 7.

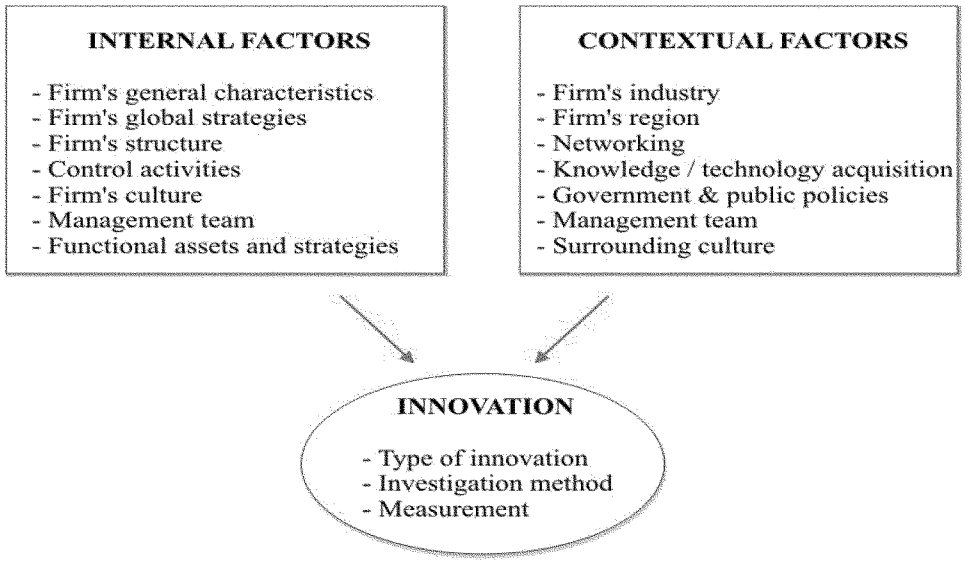

Figure 7: The framework for integrating innovation findings (Becheikh et al, 2006)

Each group in this will have several determinants of innovation. As an example, under global and business strategies specialization is cited as a determinant. A hypothesis that is very likely to be tested in a research is the correlation between specialization and imaginations. As mentioned in the subject review, specialization might also foster innovation by increasing the number of competing units searching for a solution to a specific problem (Robertson and Langlois,1995). As for diversification, it is often accompanied by formal and financial controls that can discourage technological activity (Ahuja, 2000; Galende and De la Fuente,2003; Tallman and Li, 1996). Moreover, this last argument is reinforced by studies which investigated the relationship between control activities and innovation. These studies found that financial controls can produce a short term orientation and risk-averse actions and thus undermine the innovation process (Franc¸ois et al., 2002; Hitt et al.,1996; Kochhar and David, 1996). The application stage of the proposed 5 stage model can be affected by tight financial controls of an organization which can hinder innovation opportunities.

Galanakis (2006) suggests a new dynamic innovation system called the Creative Factory Concept that is constituted by five main subsystems: knowledge creation; NPDD; product success in the marketplace; the internal factors that influence a firm's core innovation process and the national innovation environment. The core innovation process is constructed by the first three subsystems. The five subsystems operate in parallel and influence each other. These recent innovation models such as the subject model attempt to bring in external factors also to explain the innovation process. However, the complexities in such models can restrict them to literature with no efforts in applications in industry.

The literature review reveals the non availability of a prescriptive model that can be used by practicing managers to promote innovations within their organizations. A major observation is the different ways of identifying the stages of the processes in different innovation models whether they are linear or circular. Any commercial organization will pay attention to see how best they can exploit an innovation with the use of the available or affordable resources. Unfortunately very few models have paid any attention to this important aspect of the 'leveraging' stage of the innovation process. Theoretical models should make sense in business to gain acceptance from practitioners. Further, the model has to be simple and easy to understand. Flow diagrams or check lists running in to pages will not work. In this context, the proposed model stands for a better chance to be accepted by practicing managers as the model for promoting innovations.

Although there are many models that explain the innovation process the absence of a more practically useful model has led to regular ad-hoc research studies by academics and also practicing managers to consider the innovation process as a black box making their interference a gambling. As mentioned before, the objective of this article is to share some thoughts from an ongoing research to develop an integrated model of the innovation process that explains stages of the process and determinants at each stage so that practicing managers can influence the innovation process with confidence for better results.

A new integrated approach; The ISLAM model

In this framework shown in Figure 8, the author suggests the process of innovation to be disintegrated into several meaningful stages namely Imagination (or Ideation), Synthesizing, Leveraging, Application and Modification.

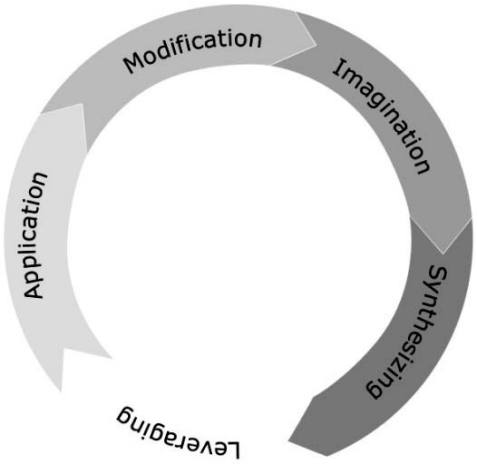

Figure 8 : The basic ISLAM model

Imagination requires seamless and free thinking that is not constrained by boundaries of existing knowledge, work practices and mindsets. Synthesizing is the process of using existing knowledge (in the industry) to make use of the concept so developed in step 1. Leveraging, the step 2 is the specific use of the new concept now synthesized with existing knowledge and resource availability of the firm. Once the specific use is identified it could be applied. This may include laboratory testing, trial delivery or commercial production using the new process or product technology. Through continuous feedback the necessary modifications will be done.

As practicing managers we may have come across many occasions where organizations have failed in attempts to innovate due to gaps in each stage described in the ISLAM model. Attempting to modify a product or a process with the available expertise within the organization (fulfilling stage 1; **Imagination** and stage 3; **leveraging** of ISLAM model) can be a guaranteed failure unless it meets the requirements of stage 2; **synthesizing** of the ISLAM model. It is the stage in which the organization studies the initial thought and its applicability in the product/ process by perusing existing theory, industry practices, evolution of the industry etc. Bypass of this stage may lead to trial and error exercises that can reject the particular innovation project. In addition, such failed attempts may create opportunities to other competing banks. This stage gives an output equivalent to a comprehensive technical feasibility study of the initial project idea in a project appraisal.

Similarly, only by fulfilling stage 1 and stage 2 of the ISLAM model (ie, Imagination and Synthesizing) a firm cannot move to the stage 4 (of Application stage of ISLAM model) bypassing the stage 3 of Leveraging. In **leveraging** the organization studies its ability to exploit the opportunity with the available resources. No firm would like to offer the industry an innovative idea that could be implemented by the competitors but not by the firm. As such, the output of the leveraging stage equates to a commercial viability study of a project proposal.

The **application** stage (the step 4 in the ISLAM model) demands the organization sound project management skills. It is essential to keep track of time and cost overruns as time to market has become a key success factor today in any industry as information flow is faster and response time of both the buyers and competitors is lower. In view of the relatively low life spans of product innovations in the banking industry it is vital to pay attention to lower the time to market. When compared with industry terminology a prototype will be the major output of the application stage in case of a product innovation. In the case of a process innovation this can be a trial run.

Failure to identify the shortcomings of the innovation through a proper feedback mechanism and taking appropriate corrective action can be the most undesirable experience of an organization especially where degree of competition is stiff. It leads competitors to offer better solutions that would incur the firm both tangible and intangible losses. Therefore, the final stage of the ISLAM model; **modification** too is an essential step of the innovation process.

ISLAM model has a time dimension and as such it is sequential. Shorter the cycle time lower the time to market. From an investment analysis or a project appraisal perspective, the

synthesizing stage is equivalent to the technical feasibility stage of a project proposal and the leveraging addresses the commercial viability where in-house resources and capabilities are carefully examined to see whether the market conditions could be met. Whether an innovation is promoted by an individual, a team, an organization or an association of firms it is reasonable to assume the logical steps of idea generation, synthesis, leveraging, application and modification in the process.

In practice innovations taking place in organizations are subject to various resource constraints. It is very unlikely that an organization will continue with an innovation when the required resources are not available and acquisition of such resources is beyond their affordability. The decision of continuity with a technically feasible idea would be further evaluated for affordability once such an idea is expressed and diffused. In other words the process reaches its third stage of leveraging having passed the first two stages of idea generation and synthesizing. The existing models do not pay attention to this stage in which the economies or societies tend to loose possible innovations at firm level before they are introduced.

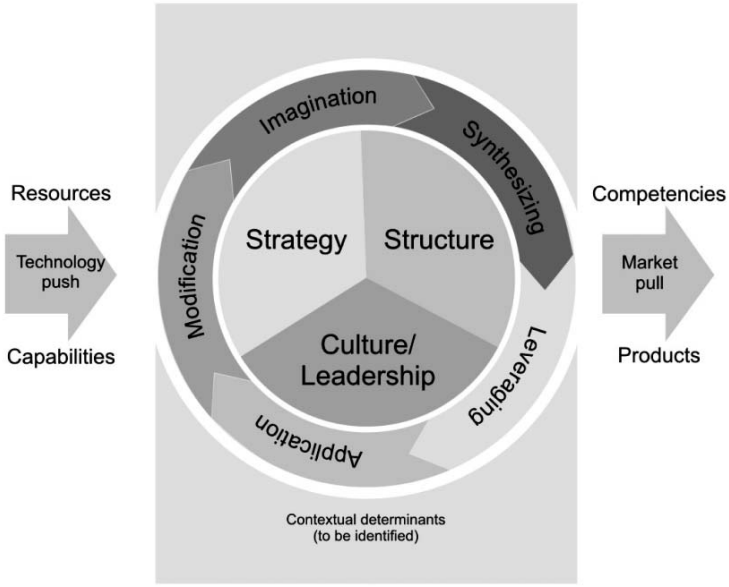

Figure 9 : ISLAM model : An Integrated innovation process model

The ISLAM model as shown in Figure 9 is being further researched to integrate the determinants of innovation at each stage of the process using survey results through a field study. The subject research is being carried out under the supervision of Professor Nazrul Islam of the Asian Institute of Technology. The author expects to disseminate the new knowledge to be gained through the findings to the readership of this article through a similar future publication.

Conclusion

Revenue growth is a primary driver for shareholder value. Without exception, almost all major banks around the world are struggling with how to drive the future top line growth. In turbulent markets cost containment too has become a major challenge to ensure profitability and competiveness. Whilst technological developments in supporting industries assist the growth of banking industry in a dramatic way it is also threatened by innovations in such industries. In an era where technology convergence, disruptive technologies, integration of economies and markets are often heard threatening well established industries and firms it is of utmost importance for banks to pay attention to promote innovations to ensure profitability and sustainable growth in turbulent markets.

Although the need for innovations in the banking industry is inevitable yet the big question in front of the practicing banker is how to promote innovations. Rather than considering innovations as accidental and the innovation process as a black box this article based on an ongoing research would help managers to understand and influence the innovation process with confidence for better results.

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