Framework of the culture of innovation: A revisit

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Abstract

Innovation is a complex and multifaceted phenomenon and is influenced by many factors. It may be an environment or a culture - almost spiritual force - that exists in a company which drives value creation. From an organizational point of view, culture has multiple elements which can serve to supplement an organization's capability towards innovation. Thus, inculcating a culture of innovation is seen as a vital requirement to provide organizations with necessary ingredients to innovate. Different approaches have been implemented with the aim of capturing a framework thriving under enabling conditions and in an atmosphere of receptivity. However, most of the work thus far focuses only on particular elements of culture of innovation. This conceptual paper draws upon a wide range of theoretical and empirical models to deduce a holistic framework. The resulted framework includes human factors and cultural-based determinants which are always dynamic and contextual. Ultimately, the paper emphasizes the importance of a broad framework which covers the interconnected dimensions in generating a culture of innovation.

Keywords: Top management, Organizational factors, Innovation culture

Introduction

While the notion of innovation has emerged as a key concept in many facets of our life over the past two decades, the knowledge about innovation as a process, its determinants, and economic repercussions is still insufficient (Abrunhosa, 2003). As innovation itself is interpreted as a predominantly social and cultural process, the concept of innovation as a culture is still in its infancy. Understanding innovation as a complex and multi-dimensional phenomenon remains a significant agenda for many researchers (Adams, 2003). This understanding requires researchers to view the innovation within a matching process of interrelated activities of soft and hard factors. It also requires taking account of the organizational culture of change (Roffe, 1999), and the social and cultural components of innovation (Bovermann and Russell, 2004).

From a practical point of view, managing innovation is important for survival for business organizations, government agencies and knowledge institutes. It implies giving employees opportunities to explore and experiment, whereas the management provides support through active encouragement of the employees' innovative behaviors. In a wider sense, the organization itself should also have structures and processes in place so as to allow smooth transitions from the generation of new ideas to the implementation stage. Managing innovation is therefore about creating a culture in which new ideas are generated, valued, and supported (Streets and Boundary, 2004). In consequence, inculcating a culture of innovation is

seen as the vital requirement to provide organizations with the necessary support to their innovation process.

To fully grasp and capitalize innovation culture in its best form, a number of organizations and institutions has called for a more broad-based and holistic approach (e.g., Bovermann and Russell, 2004). Though, along period of literature, many approaches have been generated with a view to developing a framework thriving under innovative enabling conditions and in an atmosphere of receptivity. Yet, most of the previous approaches have focused only on particular elements of culture of innovation. This paper draws upon a wide and eclectic range of literature to present a holistic framework. The resulted framework offers an integrated structure to the innovation culture by highlighting the key elements and their interactions. Ultimately, the authors emphasize the importance of a broad framework aimed at capturing the important dimensions in generating a culture of innovation. The paper is a literature-based research which focuses its analysis in light of combining the results found from studies on innovation culture. Relevant literatures were reviewed and synthesized to highlight the important issues involved in building an innovation culture model.

Literature review

The literature reviews have tended to concentrate primarily on three basic topics: the conceptual aspects of innovation, the culture and its relation to innovation, and a review to the previous studies. The review starts by providing some background on the innovation concept, process, and its determinants. The role of culture that emerged as an important element in the development of innovation culture will follow. We then conclude with an analysis of a number of literatures that examined the relationship between innovation and culture.

Innovation defined

Innovation was derived from the Latin word 'innovare', meaning 'to make something new'. Though the importance of innovation is increasing these days, understanding the whole concept remains difficult (Szmytkowski, 2005). One of the key challenges of understanding innovation is the lack of consensus about what the term means. Academic literatures have provided a number of definitions of innovation, each revealing its important aspects. However, the two core aspects of all definitions were concerned with its newness (i.e. first use of new knowledge) and the degree of relativity (i.e. some thing new in relation to a specific organization) (Jaskyte, 2002).

Schumpeter (1934) described innovation clearly in his preceding works as the carrying out of new combination of production means which include the introduction of new goods, new methods and new market. Zaltman *et al*. (1973) defined innovation as the perception of a social unit that decides its newness. According to Drucker (1974), innovation can be generally defined as the process of equipping in new improved capabilities or increased utility (i.e. innovation is not a science or technology but a value). Rogers and Kim (1985) described innovation as anything perceived to be new by the people doing it. For Ahmed (1998), innovation is the process of commercializing one or more ideas that they can be exchanged for something of economic or competitive value. In summary, the above definitions have a central theme on one of the following aspects: usefulness, newness, novelty, creativity, products/processes, and commercialization. However, all of them are acceptable in the circumstance in which they are defined. In its broadest sense, innovation is about the creation and implementation of a new idea in a social context with the purpose of delivering commercial benefits.

Innovation process

The dynamic of innovation process has become even more interactive where the on-going mutual co- evolution of industry, universities, and policy environment has an important role to play. According to Glor (2004) many of the recent innovation process studies have pointed toward the interdependence of economic, political, social and cultural factors in determining the relative degree of the innovation success. According to Glor, these studies paved the way towards a better understanding of the complex interdependencies between internal firm dynamics around innovation process and the broader institutional setting, within which firms operate. On the other hand, other contemporary studies of innovation process treat it systematically by measuring R&D inputs and regularity schemes, but neglect the less tangible aspects of innovation process such as culture components (e.g. beliefs, and value system) (Ziegler, 1997). It seems clear then, innovation process is complex phenomena and that many variables have roles to play in determining its process.

Started by its conceptual definition, the term "innovation process" has been the subject of numerous scientific papers. Despite the fact that innovation as a process is becoming widely accepted, there are differing views on how it can be described (Molina-Fernandez, 2001). By reviewing a rich and varied menu of the studies and insights into innovation process, many authors have provided definitions for the term "innovation process", based on their own nuance. Rothwell (1994) sees innovation process as a learning process, including both external and internal sources of knowledge as accumulation of know-how. Pavitt (2003) stated that innovation processes could be cognitive, organizational, and/or economic while Tanayama (2002) described the innovation process as problem-solving activity that likely enhances the internal firm learning capability. Gellatly and Peters (1999) refers the term to the key features of inputs to, and outputs from whereas Kemp et al. (2003) described the concept as the transformation process in an innovation trajectory. From the citation of the above definitions, two themes regarding the innovation process are apparent. Firstly, there is some degree of conflict in the innovation process explanation; secondly, there is a need to increase the understanding of the innovation process complexity and its models evolution.

Concerned with the inherent complexity of the innovation process, more attention is given to better understand the various forms and schemes of innovation process. These include the external broader conditions and the internal environment contexts which were perceived as factors that can foster or inhibit innovation process. However, since the beginning of the 1960s the innovation process in form of structureal models is a matter of description. The early pioneering ones for example have described the innovation process as a linear sequence of clearly identifiable activities. Others that represent recent view believed that identifying boundaries between the stages is a difficult task (Fernández, 2001). Consequently, the authors believe that with all these efforts, the innovation process is far from capturing its real complexity and is still more complex than the models being suggested (Duncan, 1997).

To distinguish all what have been accounted for innovation process models, Rothwell (1994) has classified them into five generations; each generation reflected the corporate strategy pattern and underlying macroeconomic conditions of its time. The classification started from a simple linear models through a more complex and interactive models; so called Rothwell's Fifth Generation Model or System Integration and Networking (SIN). The latter is of more interest as it attempts to convey the whole complexity of the innovation process and the real world context. It included a multi-actor process and high-level of inter- and intra-firm integration. Although the illustration of the innovation process by means of model is depicting

many factors and the feedback processes that affect the implementation trajectory, the determination of these factors and its relative importance is of great interest to be understood.

Determinants of innovation

As has been mentioned earlier, innovation is a very complex process as it is conditioned by a variety of factors and elements. Identifying these elements as the determinant of innovation however, is an important task that all managers need to work on (WIPO, 1999). However, despite the significance of the determinants of innovation, researchers have made relatively little progress towards understanding what determines the success of innovation. Nevertheless, some prospective and paradigms on what being considered as the main determinants of successful innovation can be found in literatures. For instance, traditional innovation theory (e.g. Schumpeter, 1934) considered innovation as a result of radical act generated by the introduction of a new element or a new combination of already known elements in a determined product. The technological-economic paradigm (e.g. Dosi, 1982) considered the innovation process as it emerges at the R&D department from a scientific basis (Molina-Fernandez *et al*., 2002). On the other hand, the entrepreneurship paradigm (e.g. Kent et al., 1982) considered the entrepreneurial elements as the main agent of the innovative process whereas the marketing science, which developed the strategic paradigm of innovation (e.g. Kotler, 1983) considered business strategy as the main determinant of innovation (Chen, 2004).

Alongside the above perspective, the national innovation systems approach which was introduced in the late 1980s has investigated the innovative activity in a broader sense. It adopts a broader and interdisciplinary perspective in which it tries to encompass a wide array of the determinants of innovation that are important for organizational, social, and political factors (Johnson and Lundvall, 2003). Drawing on this concept, Read (2000) carried out a comprehensive and systematic review to verify the main determinants of successful innovation. Based on his study, the most important determinant was the management support for innovation (i.e. top management plays crucial role in providing support for innovation culture).

Culture and innovation

Innovation activities occur in the specific social and economic context and the cultural and political traditions of the respective national. Given the complexity of the innovation phenomenon and the inconsistency of innovation research results, it is increasingly evident that the cultural perspective might be useful for understanding innovation (Jaskyte, 2004). Kanter (1983) suggested that innovative organizations need to adopt a "culture of pride and climate of success". Tushman and O'Reilly (1997) viewed culture as one of the most important factors in the management of innovation. Therefore, a more participative management style within a supportive culture is favored, where communication and teamwork are optimal, and where the structural flexibility, empowered employees, risk taking, and occasional failures are tolerated. With the right mix of these factors in place, innovation has the potential to flourish.

Culture, on the other hand, is complex and multi-faceted. To reach even a basic understanding of them requires openness to looking in many different ways (Massey, 1998). Historically, the word culture comes from the Latin root colere (to inhibit, to cultivate, or to honor). In current literature, “The way we do things around here,” for instance, is a common definition of culture (Got and Sanz, 2002). To attribute the cultural concept to the organizational setting, Schein

(1983) sees it as the pattern of basic assumptions which a group has invented, discovered or developed in learning to cope with its problems of external adaptation and internal integration in which he then termed as "organizational culture". The concepts related to organizational change, growth and innovation are common in almost all organizational culture frameworks. In order to operate successfully within any business environment, it is essential to understand the values that drive and support the culture of that environment. It has been argued that the capability to produce new ideas, and transform them into successful propositions is fostered by the culture of the organization. Organizational culture becomes a powerful determinant of the innovative potential (Gregory and Carmazzi, 2005; Anthony**,** 1999) and an organizational ability to sustain an innovative-supportive culture. To nurture and sustain a culture of innovation, organizations first need to develop a conductive environment where members feel free to contribute (Beck, 2004). Organizations need openness, mutual trust, encouragement management behavior, strategic orientation, supportive structure, and learning and knowledge acquisition approaches. Thus, nurturing of the innovation culture is fundamentally a managerial, cultural, strategic and structural factor.

Several models have been built to illustrate the role of organizational culture in fostering innovative potential. Hauser (1998) developed a conceptual model which suggested that organizational culture plays a vital role in the innovation process. Schein (1992), on the other hand, developed a model that looks at culture as a pattern of basic assumptions, which exists at three levels: artifacts, values, and basic assumptions (Figure 1).

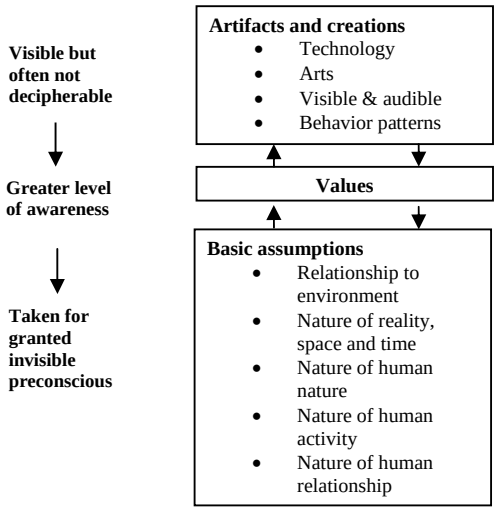

Figure 1: A model of organizational culture (Schein, 1992)

Prescriptive approaches to innovation culture

In seeking a better understanding of the factors contributing to innovation culture, researchers have examined the involvement of many concepts. Those include organizational theory, management role, and educational administration, sociology, and psychology. This review presents a summary of these studies in order to best assess the state of the findings and to provide the basis for our framework development.

Chavda (2004) examined the determinants of an innovation supportive organizational culture. The analysis reveals that organizational support for innovation is significantly and positively influenced by management support, trust, rewards, goal clarity, and organizing work around teams. Watson (2003) explored the effect of organizational culture on the adoption of innovations in higher education institution. The findings of this study provide more realization of cultural factors and their effects on the innovation process. Jaskyte (2002) has also provided support for the inclusion of organizational culture in the innovation models in order to improve the organizations innovativeness. Giving the many type of organization culture, Obenchain (2002) examine the relationships of organizational culture type to organizational innovation in institutions of higher education. The results prove that the prospects of innovation implementation are associated with culture type, in particular, the characteristics of the adhocracy culture type.

At the level of managerial behavior, Brendle (2001) studied the impact of personality traits of the owner-managers in support of innovation culture. The study found that the personality traits of proactiveness, openness to ideas, openness to actions, and risk-taking propensity are key requirements to create a culture supportive of innovation. At the level of collective cultural behavior, Fatima (2000) studied on the relationship between organizational members' perception of learning culture and their concerns about the innovation culture in Malaysian public sector. The study stresses the role of leadership in organizational learning and innovation culture. Parker (1989) examined the relative use of five categories of basic organizational cultural assumptions. He found that the practitioners who were interested in creating the perception of organizational support for innovation on the part of employees could do so through statements at the level of basic assumptions. Additionally, Krauss (2000) has found strong relationship between innovative initiatives and organization risk taking culture. In his study, government agencies that promote a risk taking culture were more engaged in innovation initiatives. In another study, Giberson (2001) found that leaders have a significant role in the creation of their organization's culture, via the demonstrated relationships between the founders' and leaders' values and personality.

Towards a holistic model of innovation culture

Modeling in innovation culture has consistently been cited as a means for an effective conceptual approach. Rarely, however, do current models address the entire framework of concept. Drawing on a variety of approaches and theories used in the previous studies, the model presented here is designed to facilitate a more effective and structured means of innovative culture. The model is based upon five observed elements of intersection: leadership, structure, strategy, organizational culture, and the innovation culture as the outcome. By integrating the above factors, it is possible to create a more holistic model of innovation culture, which is believed to be more consistent with reality as compared to the fractional models.

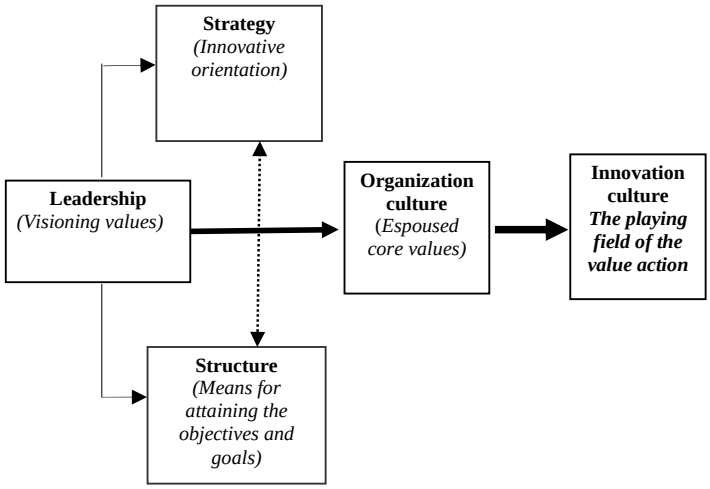

Figure 2: The holistic model of innovation culture

Figure 2 illustrates a simplified, yet a more comprehensive structure of the innovation culture model. The model consists of five blocks, the first four (leadership, structure, strategy and organizational culture) are considered the independent variables while the fifth (innovation culture) represents the dependent variable. Each of these elements is elaborated in the following discussion.

Culture is a stable, conservative, and resistant force that is likely to change only through management intervention (Hatch, 2004). In this model, the role of leadership has been built on the premise that culture is stable until leaders act to change it (Schein, 1990). This act however, is considered as the "primary task" to formulate strategy and structure in order to facilitate the innovative potential. The result of this act in turn, will produce a set of innovative core values across the organization which is embedded in the organizational culture. Therefore, the importance of leadership is central in creating a culture-supportive of innovation and without which they are unlikely to create an innovation culture.

The determination of strategy is usually a task that belongs to the top management. In other words, top management prescribes a set of strategic goals. It appears that reflecting the value of purposefulness in the goals and objectives of organizations has an influence on innovation. In our model, strategy is a task induced by the leaders, since leaders may envision a bright future and identify opportunities and provide support for creating innovation culture. The established vision and mission thereafter will become values that can be transformed into individual goals and their oriented innovative objectives. To become an enact form of innovation related norm; strategy becomes a basic implicit assumptions and is also embedded within the organization culture. Any strategy for improving efficiency should not be developed and implemented in isolation but must be considered in the right context, taking into account non-tangible factors such as the culture of organizations (Dorabjee *et al.*, 1998). Organizational structure provides another dimension for contrasting our model. Structural characteristics such as flat structure, autonomy and work teams may promote innovation, whereas specialization, formalization, standardization, and centralization may inhibit innovation. In our model, the organization structure has the role in generating the structural

values supportive of the innovation practices. The structure is aligned to provide the structural elements of the organization. These elements include communications, flexibility, teamwork, and decision-making. In shaping the culture to be supportive of innovative potential, structural elements must be aligned to the organizational culture. This, in turn, will produce a type of cultural norms which can influence individual's interaction towards the required innovation behavior. The leaders' role in shaping of the organization's structure is directed by its values and vision. It is, therefore, the responsibilities of the organizational leaders to inspire others to lead as well as to structure the organization in accordance with the desired innovative practices.

The organization culture propels the organization towards establishment of innovative culture. According to Martins and Terblanche (2003), organizational culture has an influence on the degree to which creativity and innovation are stimulated in an organization. In the proposed model, organizational culture forms another integral part of the functioning dimensions. It is the backbone of the organizational innovation that defines and contains the organization basic values. It will be shaped according to the values of the structure and strategy which were initially established by the organizational leader. The established organization culture will hold the espoused core values as the principles that help the organization hold its direction towards creating a culture of innovation.

In summary, innovation culture in this model is the outcome of the whole previous interactions. It has arises from the multifaceted interactions between the key dimensions and the values embedded within the organizational culture. These values included the flexibility, oriented visioning, empowering, appreciation of ideas, risk tolerance, communication, encouragement, and shared decision-making. Therefore, innovation process will not be divisible activities, instead, it must occur in a cultural comprises of a coherent set of espoused values to facilitate the ongoing innovation practices.

Conclusion

Understanding and creating a culture of innovation are among the most difficult challenges faced by many researchers and managers. It requires moving away from an analysis dealing with details of a single component, to one that is based on a comprehensive view. Therefore, the need to provide a useful model with a holistic view of the innovation culture concept is inevitable. The proposed model is built on (a) the central role of top leaders in advocating the organizational changes vital to sustain innovation potential; (b) structure which represents the methods of assigning responsibilities, the way the organization interacts, and the way members communicate; (c) strategy which represents the opportunities that can pave the path to create and sustain innovation culture; and (d) organizational culture as the source of the principal feature in nurturing culture i.e. the shared values, beliefs and behaviors. The organizational culture works as a mediator and is influenced by the leaders in order to produce a culture of innovation. The emerging culture therefore will determine how creativities are encouraged, how much risks are taken, and to what extend sharing of knowledge and ideas is the norm.

To sum up, the growth of an innovative culture can be nurtured through a variety of dynamic factors. Creating a holistic model of innovation culture therefore is a long-term and dynamic process. It requires the initial role of management to drive the organizational factors towards the desired change. The change will ultimately produce an environment of innovation in which the generation and implementation of ideas in every sections of the organization becomes the norm. It will make all employees motivated and confident enough to continually

try new things. Supportive management thus, will underpin all the said practices, and without which they are unlikely to create an innovation culture. This model has theoretically aligned and framed the organizational key factors in a systematic way of interaction. Accordingly, it is recommended for use by researchers in finding empirical evidence to future strengthens the framing of the innovative culture.

References:

Abrunhosa, A. (2003). The National Innovation Systems Approach and the Innovation Matrix. paper presented at the DRUID Summer Conference.

Adams, R. (2003). Perception of Innovations: Exploring and Developing Innovation Classification. PhD thesis, University of Cranfield.

Ahmed, P.K. (1998). Culture and Climate for Innovation. *European Journal of Innovation Management,* 1 (1): 30-43.

Anthony, R. (1999). Organizational Culture and Innovation. Innovative Leader, 8 (1): Article #379, http://www.winstonbrill.com/bril001/html/article_index/articles/351-400/article379_body.html

Beck, C. (2004). Developing a Culture of Innovation: A Workshop in Creativity through Communication Climate. *International Journal of Knowledge and Change Management.* 4: 78-94.

Bovermann, T. and Russell. (2004). The Culture of Innovation and the Building of Knowledge Societies. UNESCO, Bureau of Strategic Planning 2003.

Brendle, M. (2001). Personality and Company Culture: Important Contributions to Innovation and a Source of Competitive Advantage for Small Businesses. PhD thesis, Clemson University.

Chavda, A. (2004). Determinants of an Innovation Supportive Organizational Culture in Local Governments. PhD thesis, University of New Jersey.

Chen, te-fu zooh. (2004). Knowledge-Based of Innovation in High Technology Industry. *Evergreen University Journal*. 93(12): 33-58.

Dorabjee, S. Lumley C.E and, Cartwright, S. (1998). Culture, Innovation and Successful Development of New Medicines: An Exploratory Study of the Pharmaceutical Industry. *Leadership and Organization Development Journal*. 19(4): 199-210.

Dosi, G. (1982). Technological Paradigms and Technological Trajectories: A Suggested Interpretation of the Determinants and Directions of Technical Change. *Research Policy.* 2(3): 147-162.

Drucker, P.F. (1974). *Management: Tasks, Responsibility, Practices*. New York: Harper & Row.

Duncan, P. (1997). The Impact of Information Technology on Small Legal Practices in Scotland. *The Journal of Information, Law and Technology (JILT)*. (1) 1997.

Fatima, R. (2000). Perception of Learning Culture, Concerns about the Innovation, and their Influence on Use of an on-going Innovation in the Malaysian Public Sector. PhD thesis, Georgia University.

Fernandez, A. M. (2001). Innovation Processes in an Accident and Emergency Department. *Granada: European Journal of Innovation Management.* 4:168-178.

Gellatly, G. and Peters, V. (1999). Understanding the Innovation Process: Innovation in Dynamic Service Industries. Analytical Studies Branch – Research Paper Series. Canada.

Giberson, T. (2001). Transferring Leader Values: The Creation of Organizational Culture. PhD thesis, Wayne State University.

Glor, E. D. (2004). Review Essay: Canada's Systems of Innovation. *The Public Sector Innovation Journal*, 10(2) article 25.

Got, E and Sanz, F. (2002). Mergers & Acquisitions Avoiding the Path of Decay. Master thesis. .linköping University.

Gregory A, Aarons, G. and Carmazzi, A. (2005). Organizational Culture and Climate and Attitude toward Innovation Adoption. 20th Annual SIOP Conference California, 2005.

Hatch, M. (2004 a). *New Direction in the Study of Organizational Change and Innovation Processes*. New York: Oxford University Press.

Hatch, M. (2004 b). Dynamics in Organizational Culture, in M.S. Poole and A. Van de Ven, eds. Handbook of Organizational Change and Innovation. New York: Oxford University Press.

Hauser, M. (1998). Organizational Culture and Innovativeness of Firms: An Integrated View. *International Journal of Technology Management*. 16(1): 239-255.

Jaskyte, K (2002). Organizational Culture and Innovation in Nonprofit Human Service Organization. PhD thesis, University of Alabama.

Jaskyte, K. (2004). Transformational Leadership, Organizational Culture and Innovativeness in Nonprofit Organizations. *Nonprofit Management and Leadership*, 15(2): 153-168.

Johnson, B and Lundvall, B (2003). Economic Development and the National System of Innovation Approach First Globelics Conference, Rio de Janeiro.

Kanter, R.M (1983). The Change Masters. New York: Simon & Schuster.

Kemp, R.G.M., Folkeringa, M., de Jong, J.P.J. and Wubben, E.F.M. (2003) 'Innovation and firm performance', Research Report 200207, Zoetermeer, Netherlands: EIM.

Kent, C.A., D.L- Sexton and K.H. Vesper (1982). Encyclopedia of Entrepreneurship, Englewood Cliffs.

Kotler, P., (1983). *Principles of Marketing.* Englewood Cliffs: Prentice Hall.

Krauss, E. (2000). Shifting Government: an Examination of Organizational Risk Taking Culture and Government Innovative Initiatives. PhD thesis University Dominguez Hills.

Martins, E .C and Terblanche, F. (2003). Building Organizational Culture that Stimulates Creativity and Innovation. *European Journal of Innovation Management*. 6(1): 64-74.

Massey A. (1998). The Way We Do Things Around Here: The Culture of Ethnography. Ethnography and Education Conference, (OUDES).

Molina-Fernandez, L M and Daniel A.A (2002). Determinants of Innovation Through a Knowledge-Based Theory Lens. *Industrial Management & Data Systems* 102(5): 289-296.

Obenchain, M (2002). Organizational Culture and Organizational Innovation in Not-for-Profit, Private and Public Institutions Higher Education. PhD thesis, Nova Southeastern University.

Parker, D. (1989). Organizational Culture and Support for Innovation: A Policy-capturing Approach. PhD thesis, Tulane University

Pavitt, K. (2003). The Process of Innovation. Brighton: Working Paper No. 89 *SPRU Science and Technology Policy Research*, UK.

Read, A (2002). Determinants of Successful Organizational Innovation: A Review of Current Research. *Journal of Management Practice.* 3(1): 95-119.

Roffe, I. (1999). Innovation and Creativity in Organizations: A Review of the Implications for Training and Development. *Journal of European Industrial Training.* 23(4/5): 224-241.

Rogers, E. M., and J. I. Kim. (1985). Diffusion of Innovations in Public Organizations. in *Innovation in the Public Sector*, ed. Richard L. Merritt and Anna J. Merritt, 85-108. Beverley Hills: Sage

Rothwell, R. (1994). Toward the Fifth- Generation Innovation Process. *International Marketing Review*, MCB University. 11(1): 7-31.

Schein, E. H. (1983). Organizational Culture and Leadership. Oxford: Jossey-Bass Publishers,

Schein E. H. (1990). Organizational Culture. *American Psychologist.* 45(2): 109-119.

Schein, E.H. (1992). *Organizational Culture and Leadership,* Second Edition. San Francisco: Jossey-Bass.

Schumpeter, J. (1934). *The Theory of Economic Development.* Massachusetts: Harvard University Press.

Streets, R and Boundary, C. (2004). Managing Innovation. *Australian Institute of Management - Version 1.0.*

Szmytkowski, D (2005). Innovation Definition Comparative Assessment. GNU Free Documentation License. Brussels.

Tanayama, T. (2002). Empirical Analysis Underlying Various Technological Innovations. VTT Technical Research Centre of Finland. 115- 118.

Tushman, M.L., and O'Reilly, C.A. (1997). *Winning Through Innovation*. Boston. MA: Harvard Business School Press.

Viljamaa, K. (2003). Regional Competence Building as Co-Development of Industry and Research. Industrial Performance Center USA.

Watson, K. (2003). Effects of Organizational Culture on Innovation Decisions, Does University Culture Affect the Adoption of Classroom Technology? PhD thesis, Vanderbilt University

WIPO (1999). Promotion of Innovation and Creativity. The International Bureau, Geneva. May 31 - June 4.

Ziegler, J (1997). Governing Ideas: Strategies for Innovation in France and Germany. *International Journal of policy, Administration and Institutions.* 13(3): 409-438.