CEMI

Centre for
Entrepreneurial Management
and Innovation

Creating the Innovative Organisation

CEMI Discussion Paper 0401

Tim Mazzarol

Consulting

Research

Training

Support

NOTE:

CREATING THE INNOVATIVE ORGANISATION

Tim Mazzarol, University of Western Australia (tim.mazzarol@uwa.edu.au)

ABSTRACT

Innovation within a commercial environment is about adding value through new product development, or reducing cost via changes to process technologies and systems. While is may take the form of radical, disruptive change, the majority of innovations are incremental in nature. Contemporary innovation management requires the active participation of all employees with adequate rewards and recognition of such behaviour. Management plays a key role in this process, motivating employees to seek innovative solutions and identifying opportunities for enhanced innovation via interactions with the customer. It is important for organizations to build innovation management systems able to assist with the facilitation of knowledge sharing and commercialisation among both internal and external actors.

Key words: innovation management, commercialisation, knowledge management.

THE THREE PARADIGMS OF INNOVATION

Innovation has become a key source of international competitiveness for industry, with attention focused on the creation of highly differentiated products and services that allow firm's to secure strong profit margins and avoid price competition (AMC 1994). At a national level innovation has become widely accepted as the most important driver of economic growth (Molyneux 2000). Economic analysis indicates a nexus between enhanced labour productivity and the patenting activity of Australian firms, suggesting that any decrease in innovation levels within Australian industry may have detrimental impacts on the national economy (Crosby 2000).

Although the importance of innovation to industry is well recognised, the concept remains less clearly defined with popular emphasis on new technology and radical change (Grupp & Maital 2001:23). Within a business context innovation is associated with the creation of changes to existing products or processes that can lead to the enhancement of the organization's ability to offer superior value to its customers (Tushman & Nadler 1986). Of particular importance is the ability of the organization to undertake innovation on a systematic level, producing regular improvements in product or process through the implementation of an innovation management system (Drucker 1985 :31).

The focus for innovation in business should be on finding ways to enhance competitiveness by converting ideas, processes, technologies and alliances into commercially valuable outcomes. Most product innovations are incremental with minor changes or enhancements of existing technologies. These are usually made in response to increasing competition or in response to customer feedback. Once a new product is launched and established the process of incremental improvement throughout its life cycle is usually ongoing. In a similar manner, incremental process innovation seeks to continuously improve quality, enhance productivity or reduced cost.

However, while most innovation is incremental in nature, the commercially valuable innovations are often those that create significant changes or enhancements to existing technologies, products or services. This can

be done either through a synthesis of existing ideas and technologies in creative ways to produce new products or processes, or radical '*discontinuous*' innovations involving major shifts in technology (Tushman & Nadler 1986). Such radical innovations require two necessary conditions: first, there must be a significant change to the 'core concept' of the product; second, there must be a major change to the way in which the core components of the product are configured (Henderson & Clark 1990).

Innovation may be examined through three interconnected paradigms drawing upon psychological, technological and sociological foundations (Sundbo 1998). The first focuses on the role of the individual entrepreneur, who drives innovation through his or her own personal desire for change and financial reward. The second focuses on the development of new technologies and the role of scientific R&D, usually within the framework of a large organization or publicly funded agency. Finally, the third paradigm places the focus on the professional manager and their development of market-oriented strategies designed to secure sustainable competitive advantage via innovation.

Of these paradigms the first remains common within small firms, but less common within the wider industry context. It is contingent on the emergence of a creative genius or visionary entrepreneur who is able to shape a product or process innovation to secure competitive advantage within established markets for a small firm. Although the small business sector contains many entrepreneurial innovators, it is only a minority that emerge to public prominence. Nevertheless, small firms provide a rich source of future innovations (NCOE 2000).

The second paradigm has been at the forefront of public and corporate policy for much of the past century (Sundbo, 1998). It adopts a technology-push orientation in which the key emphasis is upon fundamental scientific and technological research leading to breakthrough technologies. It remains the focus of most of the "innovation" programs provided by federal and state governments in Australia (ISR 2001). However, the success of such technology-push strategies remains problematic, with difficulties emerging in the transfer of scientific knowledge into the market place via a process of commercialisation (Laredo & Mustar 1996). In recent years greater attention has been given to the third paradigm, in which the professional manager, via interaction with the customer or market, adopts a demand-pull orientation to innovation. While this third paradigm appears particularly relevant within service industries (Sundbo 2001), there is little evidence to support the dominance of either paradigm (Dosi 1982).

Despite the ongoing debate over the merits of the creative genius, technology-push versus market-pull in the innovation process, a more pragmatic perspective acknowledges that successful innovation requires a balancing of all three paradigms. There is a need for organizations to encourage entrepreneurial behaviour among their staff and to lead their industry in new product and process development through investment in research and development. However, they must also maintain a strong orientation toward the market. Such firms not only partner with demanding leading edge customers, but place significant value on their employees skills and knowledge while fostering a climate of creativity and innovation (AMC 1995).

A PROPOSED FRAMEWORK FOR THE INNOVATIVE ORGANIZATION

Organizations that wish to adopt enhanced levels of innovation must possess five key elements: 1) a strong market orientation; 2) strong innovation focused leadership; 3) an innovation-ready organizational culture; 4) ambidextrous structures; and 5) a non-linear strategic planning process. Figure 1 illustrates these five elements, which are discussed in greater detail in the following sections of this paper.
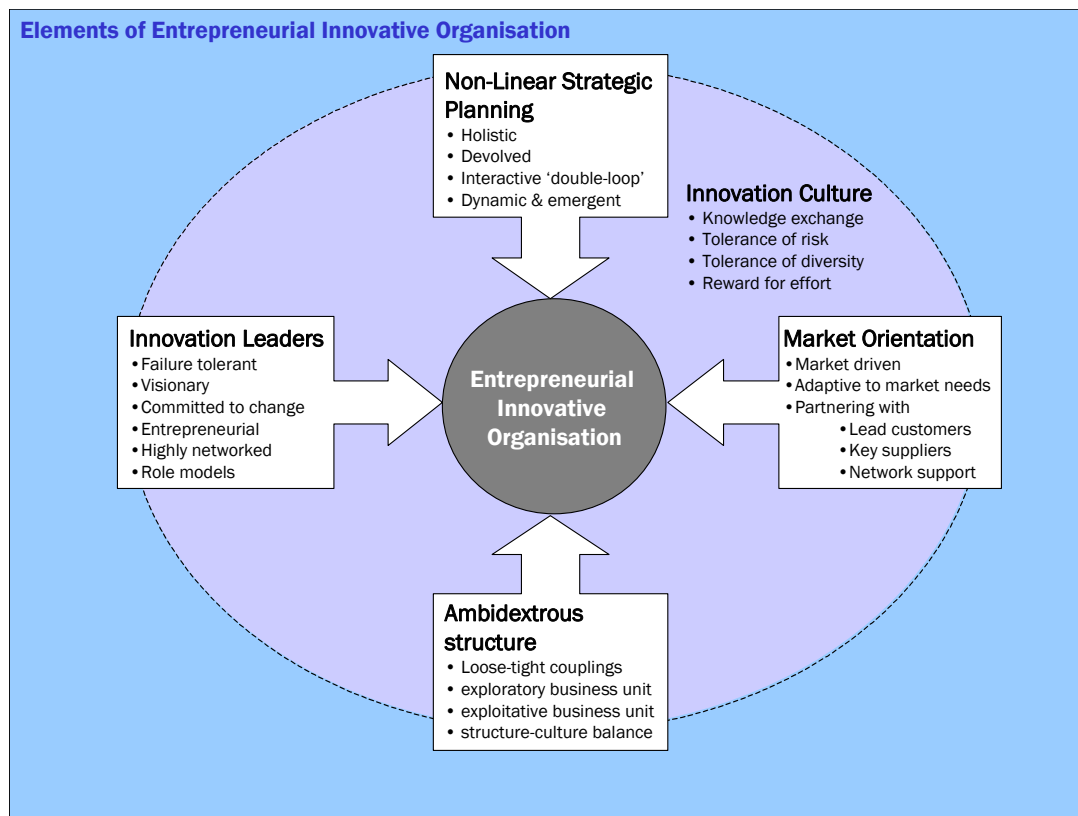
Elements of Entrepreneurial Innovative Organisation

Non-Linear Strategic Planning
- Holistic
- Devolved
- Interactive 'double-loop'
- Dynamic & emergent

Innovation Culture
- Knowledge exchange
- Tolerance of risk
- Tolerance of diversity
- Reward for effort

Innovation Leaders
- Failure tolerant
- Visionary
- Committed to change
- Entrepreneurial
- Highly networked
- Role models

Entrepreneurial Innovative Organisation

Market Orientation
- Market driven
- Adaptive to market needs
- Partnering with
  - Lead customers
  - Key suppliers
  - Network support

Ambidextrous structure
- Loose-tight couplings
- exploratory business unit
- exploitative business unit
- structure-culture balance

FIGURE 1: THE ELEMENTS OF THE INNOVATIVE ORGANIZATION

MARKET ORIENTATION

The possession of a strong market orientation that enables a firm to closely monitor and respond to the needs of customers has been recognised as a key element in the successful development of innovation (Quinn 1985). Successful innovators establish strategic partnerships within their industry supply chain, developing close relationships with lead customers and key suppliers, as well as third-party "*resource network*" partners such as banks, venture capital suppliers, and providers of new technology (Holmlund & Tornroos 1997).

While all customers are important the "*lead customer*" is the most significant. Lead customers are defined as those that are dominant in their industry and generally have above average levels of competitiveness. Such customers are frequently demanding and push their suppliers to enhanced levels of performance. Lead customers assist the innovation process by demanding high standards and continuous improvements in both product differentiation and cost reduction via process enhancements. They also keep the innovator firm informed of new market trends and frequently serve as development partners, generating ideas for innovations and assisting in their eventual implementation (AMC 1994). A similar relationship can be developed with *"key suppliers"*, or those suppliers that provide a critical level of components to the firm.

Miller (2001) argues in favour of closely engaging with customers and suppliers to examine needs and possibilities in what has been described as a Fourth Generation (4G) spiral process for innovation (Miller & Morris 1999). Within business networks the interaction between the supplier firm and its lead customers can lead to this type of innovation and diffusion process. Collaboration over identifying new products or processes can be achieved if such customer-supplier relationships are carefully leveraged.

Japanese *Keiretsu* organizations have traditionally developed strong network partners between their lead customers, key suppliers and third-party resource networks. Compared with their American and other "Anglo" business counterparts, the Japanese tend to maintain very close relationships between suppliers and manufacturers with engineers from supplier firms engaging from an early stage in the development of new products. A common approach sees engineers from the supplier firms working within the R&D departments of the prime manufacturer (focal firm) as 'guests' or even on a permanent basis. Relationships among the Japanese *Keiretsu* member firms are traditionally long-term and based more on trust and reputation than price (Echeverri-Carroll 1999).

The importance of this level of partnering for organizational innovation is the role it plays in enhancing knowledge flow between the network partners. Lead customers, particularly those located within international markets, are an important source of information and ideas for new product or market opportunities. Research undertaken with Western Australian firms supports this view. Three studies were conducted by the Centre for Entrepreneurial Management and Innovation (CEMI) of the University of Western Australia's Graduate School of Management (GSM), with firms engaged in a range of industries focusing on information and communications technologies, ship and boat building and general marine engineering and fabrication, defence technologies and the mining and offshore oil and gas sectors (Mazzarol 2003a; 2003b; 2004; Mazzarol, Reboud & Adam 2004).

In all three studies 171 firms were surveyed with a further 44 firms participating the development of in-depth case studies. These firms, while generally small in size, were notable for their high levels of innovation. An example of this was the finding that around 18 to 24 per cent of their annual turnover was invested in R&D, with a strong emphasis on new product development and innovations in process technologies. The average number of new product innovations generated by this group over the previous three years was four. Around 45 per cent of these firms reported having a formal or well-defined process to carry ideas through to commercial implementation.

Within the first two studies 60 per cent of a sample of 114 firms indicated that their lead customers were an important source of new ideas for future innovations (Mazzarol 2003a; 2004). Customers were rated as the second most important source of new ideas after the firm's senior managers. Working closely with lead customers was considered to be the most financially beneficial activity the firm could undertake, followed in-turn by working closely with key suppliers. Lead customers served to drive performance improvements within these firms by demanding high levels of product quality and service delivery. Lead customers were also important market opinion leaders who assisted the innovator firms in establishing their product's credibility within targeted markets.

Seventy-nine per cent of these firms had worked closely with their lead customers to develop or improve products and services, and their relationship with these customers had significantly strengthened over the past three years, becoming more *"partnership-like"* and less *"arms-length"*. Face-to-face contact between lead customers and senior managers from these firms was rated as the most important means of communication that the firm could undertake. Direct contact between lead customers and senior managers from these firms took place frequently with at least 60 per cent meeting monthly. It should be noted that most of these firms were engaged in exporting and the majority of lead customers were located overseas or interstate, requiring senior managers to travel regularly to hold such meetings.

In the third study (Mazzarol 2004) of 57 high innovator firms, customers, particularly lead customers, were rated as the most important influence on strategic decision making by the Chief Executive Officers (CEO) of these respondent firms. A total of 91 per cent of these CEO's indicated that their lead customers had a strong influence over strategic decision making in relation to the launching of new innovations. This placed

customers ahead of the firm's own Board of Directors, other senior managers and equity partners or shareholders.

INNOVATION LEADERSHIP

Innovation is a process rather than a destination. This process involves the full chain of actors who comprise the firm's value chain and industry supply chain, ranging from the customer throughout the firm and on to the supplier. Management, particularly senior managers play a crucial role in the innovation process. Managing innovation within an organization requires leadership to set strategic directions, motivate and empower employees and guide activity in desired directions. At least four key management problems have been identified in the innovation management process (VanDenVen 1986).

The first of these is dealing with human capital, specifically capturing people's attention and focusing their efforts on innovation. By nature people tend to focus on maintaining the status quo and harvesting established strategies or technologies rather than seeking new solutions. Further, the more successful an organization is, the more complacent its people can become. The second problem is related to process, specifically how to get innovative ideas from people's heads and into action. Some large service firms in Europe have now established innovation departments that focus purely on capturing good ideas and examining their feasibility. A third problem is associated with organizational structure. Here the manager must find a way to integrate a variety of functional responsibilities and intellectual or professional disciplines together to achieve optimal outcomes. This places pressure on the structure and culture within the firm. Finally there is the problem of strategy. Innovations lead to dynamic change within the firm and within industries. Because change is frequently risky and difficult for organizations there must be strong institutional leadership to guide change and find ways to transform the structure and culture of the firm (Stringer 2000).

Research into the factors likely to influence innovative behaviour among employees highlights the importance of leadership and role modelling by senior managers. The expectations that managers were seen to have toward innovative behaviour was of significant importance. When employees understood that managers expected them to behave in an innovative way they were more likely to respond. Supporting this was the overall quality of the relationship between the manager and the employee and how that exchange served to reinforce the manager's commitment to innovation within the organization. What this study highlights is the critical importance of leadership within organizations that are seeking to become more innovative. Only where managers serve as role models and communicate their desire for innovation and how such innovation may be achieved, will employees respond with strong innovative behaviour (Scott & Bruce 1994).

Within the research studies undertaken by CEMI of high innovator firms in Western Australia the role of senior management in driving innovation was highlighted. The most important source of new ideas for innovation among these firms was the senior management, usually the CEO who in many cases was the entrepreneur behind the business venture. Out of 114 firms surveyed, 75 per cent indicated that top management was the most frequent source of new ideas for innovation. Of the 57 high innovator firms examined in the third study, the CEO remained the most influential person in relation to the launch of new innovations with the power to decide whether or not the firm proceeded with the initiative or abandoned it.

INNOVATION-READY ORGANIZATIONAL CULTURE

Entrepreneurial orientation within small firms is usually the responsibility of the owner-manager(s) who set the strategic direction of the company and typically lead its innovation. In larger organizations the challenge has been to foster entrepreneurial spirit among employees via a process of internal corporate venturing that may promote innovation (Burgelman 1984). This has been seen as achievable via the empowerment of middle

management (Kanter 1982), or via the formation of "innovation management task forces" that can motivate employees and implement strategies (Foster & Pryor, 1986).

Innovative behaviour among employees has been found to be positively associated with the level of support for innovation engendered within the organization's culture. This is more important than the availability of resources for undertaking innovative activities (Scott & Bruce 1994). Organizational cultures that foster creativity are likely to be more conducive to innovation (Sonnenberg 1991). Senior management within such enterprises will also need to be more tolerant of failure (Farson & Keyes, 2002), and encourage subordinate staff to be more autonomous and willing to take calculated risks (Pearson 1988). Such initiatives may be increasingly more important within industries where product and process technologies have reached the limits of further development. Under such conditions investment in human resources via training and skill development can become a source of competitive advantage (Pfeffer 1994).

In seeking to generate a suitable climate for innovation organizations must look to their strategic human resources management policies. First they need to examine their *reward structure* to ensure that employees are suitably recognised and rewarded for innovation and risk taking. This needs to consider – goal setting feedback, individual responsibility and reward for effort. Adequate reward systems need to reinforce and enhance innovative, creative behaviour. Firms must be characterised by providing rewards contingent on performance providing challenge, increasing responsibility and making the ideas of innovative people known to others in the organizational hierarchy. Middle managers and employees must be encouraged to believe that innovation is part of their role within the firm. *Resource* allocation within the firm must also be examined. Allocation of scare resources to competing projects with different levels of risk and return is a major task of an organization seeking to encourage innovation. Time and workloads must be reviewed to ensure that teams have the capacity to pursue new ideas. There must also be a tolerance of *risk taking* within the organization and a flexibility of structure to adapt and change as required (Savery & Mazzarol 2000).

The role of employees within the Western Australian firms examined by CEMI found that close to half (48%) of these firms indicated that employees were an important source of new ideas. In addition to the regular face-to-face contact between senior managers and lead customers, similar contact took place between customers and employees from within these firms. While this was the case for sales and marketing staff, it was also equally the case for technical staff. Direct face-to-face contact between technical staff and lead customers took place on at least a monthly basis for around 74 per cent of firms. Contact between customers and technical staff was slightly more frequent than between customers and sales staff in these firms. Within small high innovator firms, the opinion of senior managers in the strategic innovation management process was rated as of greater importance by the CEO than those of the firm's equity partners or shareholders.

This close contact between customers and employees, and the engagement of employees in the innovation process is important for the opportunity it creates for the flow of information and the sharing of knowledge. Innovation is dependent on the diffusion of knowledge between individuals via a two-way process requiring 'learning by sharing' (Arias 1995). Individuals need a knowledge network that offers them timely access to information allowing them to complete work tasks, and that keeps them up to date on the latest trends. When faced with a problem, the network system should also include key contacts to which the individual can go to seek assistance or advice. The information that is passed via this network should include examples of best practice in the industry and details of how to solve routine or commonly encountered problems (Hogberg & Edvinsson 1998). Within some large organizations corporate websites and intranets have been created in order to provide a medium for information sharing and knowledge exchange.

One example of this is *"AlphaWorks"* created by IBM. This is a dedicated company website upon which beta version software products are posted with limited license download offers to the public. Product ideas that

needed 'market testing' were placed there and if demand for them proved strong, full-scale production was then considered. Around 40 per cent of the technologies posted on the site found their way to market and many of IBM's staff rely on "AlphaWorks" to do their jobs (Wolpert 2002).

A further example is that of Proctor & Gamble, who created a corporate intranet system designed to replicate a *"global lunch table"* that would facilitate interaction between individuals across their entire worldwide organization that might take otherwise take place at the lunch room level in a smaller firm. Internally, P&G created a *"global technology council"* comprising business unit heads designed to bring together the competencies of the firm. A *"corporate innovation fund"* to provide seed capital and an *"innovation net"* the communication tools to link researchers together across different communities of practice that regularly report via smart learning reports that can be accessed via the intranet. Communities of practice are essentially discipline groups that span business units and each supported by senior managers with budgets to facilitate cross-fertilization of ideas and diffusion of expertise. P&G engages with universities in funding research fellows and has a strong program of patents and IP licensing to assist with technology transfer across its network (Sakkab 2002).

Knowledge is of two kinds: 1) *explicit knowledge* – comprising information and data that can be easily stored, retrieved, revealed and transferred; and 2) *tacit knowledge* – involving ideas, skills, and understandings held within the minds of individuals (Polanyi 1957). Learning within organizations requires a transfer between these two types of knowledge of which the most powerful is usually face-to-face interactions in which tacit knowledge is exchanged directly (Nonaka & Takeuchi 1995). Organizations seeking to foster innovation must create environments conducive to the free flow of knowledge and ideas.

Three interrelated elements must be considered by managers seeking to develop effective knowledge network structures within organizations. The first of these are the *"facilitating conditions"* comprising the broad structural and cultural dimensions that define the network. Actors within the network are influenced by the management systems, corporate culture and organizational structure that define their own work environments. The close geographic proximity of actors, the nature of the content being exchanged (e.g. products or information), the power relationships within the network (e.g. dominant firm versus small suppliers) are all likely to influence how the social relationship within the network emerges. The second is that of the *knowledge work processes*. Here the social interaction and communication flows between the actors are considered. Actors may be individuals, groups, organizations or larger formations. The relationship structure is determined by the form (how long how close), content (what is exchanged) and intensity (frequency of contact). An important aspect of the role this network plays in learning is how well the spiral of knowledge (Nonaka & Takeuchi 1995) a process through which there is a flow of information and ideas resulting in enhance understanding and learning among individuals and groups. Finally, there is the *knowledge network architecture*, which involves the 'tools' that can be used to manage the relationship. ICT technologies can provide a platform for such tools, but must be supplemented by organizational structures (Seufert, von Krogh & Bach 1999).

The development of knowledge networks is something that should be viewed by managers as a long-term process undertaken in conjunction with organizational development. For example, use of the Internet and email software offers managers within a given network the 'tools' to undertake enhanced communication and knowledge sharing. However, such technologies may also serve to reduce the level of face-to-face interaction that might reduce the level of tacit to tacit knowledge transfer. The relationship between the institutional properties (e.g. management systems, corporate culture or organizational structure) and the actors can be important within network development both internally and externally within the firm.

AMBIDEXTROUS STRUCTURE

For large organizations seeking to encourage high levels of innovation a common impediment is their own organizational structure. By its nature innovation involved new combinations of skills, resources and technologies. In its most radical form it carries higher than average risks and is frequently enhanced by placing the responsibility for the new product or process into the hands of a cross-functional team with the ability to see the project through from start to finish (Pinchot 1987). Such requirements can place pressure on existing organizational structures in which people and resources are already committed to the status quo and may either resist new change, or lose sight of the whole innovation effort (VanDenVen 1986).

Gresov (1984) suggests that the dilemma facing many managers seeking to enhance the innovation within their firms is the tension between structure and culture, implementation and innovation issues. An organization that has a highly centralized structure will be strong in terms of its capacity for implementation but weak in terms of innovation. By contrast the more 'complex' (organic) a firm is the more likely it will be good at innovation but weak at implementation. In terms of culture, the firm with a homogeneous culture is likely to be good at implementation but weak at innovation. Firms with highly heterogeneous cultures will be likely to have good capacity for innovation but less for implementation. This 'dilemma' is what faces many managers seeking to encourage innovation with their firms. Firms that centralise authority structures too rigidly and tolerate little homogeneity in their culture are unlikely to be effective innovators, even if they are competent implementers. The same is true of firms that have high levels of heterogeneity in culture and complexity in structure. While innovation may be high they are frequently unable to capitalise on such ideas and effectively bring them to market. Restructuring the firm to encourage innovation (e.g. shifting from a centralized to complex structure) may not be sufficient if culture remains unchanged. Because culture is frequently highly resistant to change, structures may move well before the culture does (if at all). In a similar manner, attempting to generate innovation by absorbing other entities, hiring new employees or creating new spin offs may create shifts in culture (e.g. from homogeneous to heterogeneous), but will not truly supply innovation if the structure of the firm remains too centralized.

According to Gresov (1984) a possible solution to this dilemma is for firms to develop a 'hybrid' organization-culture format. This seeks a structure that is either both homogenous in culture and complex in structure, or centralized in structure and heterogeneous in culture. The four combinations of culture and structure are:

1) *Centralized Structure – Homogenous Culture*: this is likely to be weak in innovation but strong in implementation. It is suitable for firms that have relatively low levels of technology within their industries and are more concerned with the effective implementation of established technologies via efficient production and distribution.

2) *Centralized Structure – Heterogeneous Culture*: this combination has the potential to be strong in both innovation and implementation. Such firms may be difficult to control given the likely tensions between the culture and structure.

3) *Complex Structure – Homogeneous Culture*: this combination is likely to be strong in both innovation and implementation. However, it will need to be careful not to allow the homogeneity of its culture to overwhelm the need for innovation and diversity.

4) *Complex Structure – Heterogeneous Culture*: this combination is likely to be strong in innovation but weak in implementation as noted earlier.

Managers seeking to enhance innovation or implementation levels within their firms must consider the dual impacts of both culture and structure. They can adjust either one or both depending on the current nature of

their existing organization. For example, a manager with a complex-heterogeneous firm might seek to enhance the implementation capacity by leaving the structure (complex) alone and working on the culture via training or cross-functional education-awareness campaigns.

O'Reilly and Tushman (2004) have suggested that organizations must become ambidextrous in structure, able to successfully develop radical innovations, while simultaneously protecting their traditional business operations. They encourage the creation of lose-tight structures in which project teams responsible for new innovations are structurally independent of each other, with their own distinct cultures and systems, but are integrated into the existing management hierarchy. Within this model, the organization creates two types of business unit. The first is an *"exploitative business"* that is focused on cost and profit, with established systems and a more traditional culture based on authority and a structure that is formal and mechanistic in nature (Burns 1961). By contrast the *"exploratory business"* is focused on innovation and growth, with a loose, adaptive organizational structure, and a culture in which risk taking, experimentation, flexibility and speed are hallmarks.

An example of how an organization might develop such an ambidextrous structure is that of Japanese telecommunications giant NTT DoCoMo Inc. (Kodama 2002). Faced with the need to create a new opportunity in the form of the 3rd Generation mobile telecommunications system i-mode, with its capability to deliver digital images, text and voice, NTT DoCoMo created a new business structure. As a large, traditional 'exploitative' organization, NTT DoCoMo had a staff of 10,625 employees, and a culture that was best defined as closely coupled, conservative and regimented. Its strategic orientation was incremental and deliberate, with attention focused on the efficient exploitation of existing core competencies. To address the new generation mobile communications market, NTT DoCoMo created an entirely new business unit GBD. Lead by a strong and entrepreneurial CEO, and with a staff of only 70 employees, GBD quickly developed a dynamic, flexible and entrepreneurial culture, with strategic orientation toward innovation and strategic networking with a wide range of partners both inside and outside the parent firm. GBD was creating the future and building new core competencies for NTT DoCoMo to exploit. However, to achieve its goals, GBD had to create a series of strategic alliances with various communities of interest. These included an 'in-house community' within the parent firm, a 'portal community' within the ISP providers, and 'platform' and 'technical' communities comprising other firms that provided hardware, software and content. While the parent firm NTT DoCoMo was engaged in incremental change, GBD was engaged in continuous or double-loop change, following a 4th Generation R&D model (Miller & Morris, 1999).

While small firms possess highly flexible, adaptive structures in which the lead entrepreneur or CEO and their key group of senior managers is the major driver of innovation, larger firms must consider restructuring to create the most appropriate organizational form to take advantage of innovation opportunities. Managers seeking to achieve such organizational change must consider both structure and culture, with heterogeneity in culture if structure is centralized, or homogeneity in culture if structure is complex.

DEVELOPING A "NON-LINEAR" PLANNING PROCESS

Finally, organizations seeking to enhance their innovation need to possess a strategic planning process that is *'non-linear'* in nature, which implies flexibility and a capacity for entrepreneurial flair (Quinn, 1980; 1985). This latter point refers to the ability of the planning process to remain flexible and permit all functional areas of an enterprise to contribute to the process (Takeuchi & Nonaka, 1986).

Innovation management should be viewed as a strategic process with a formal *strategic innovation plan* developed by senior management to spell out the organization's goals in relation to new product or venture creation. Managers should commence by setting clear goals for innovation within the firm. They should

consider what specific areas are to be targeted by innovation and what is the current capacity within the firm for innovation (e.g. core competencies). Once these issues are addressed the manager can determine the future actions required to implement changes (Foster & Prior 1986).

Attention should be given to using innovation as a means of enhancing return on investment, expanding new product development opportunities or lowering cost. Managers seeking to achieve this can speed up the adoption of new technologies to assist in the improvement of products and processes. The shortening of development and implementation cycles for new products or ventures and the creation within the firm of a culture of innovation are also part of the innovation management process. Managers also need to learn how to identify barriers to innovation within the firm. Such barriers may include a culture adverse to risk taking, or a lack of reward or incentive for new ideas (Foster & Prior, 1986).

Innovation objectives should be set to assist in enhancing internal processes throughout the value chain. Methods for enhancing or encouraging innovation within and without the firm (e.g. contract R&D, joint ventures and technology transfer via licensing) should be considered. Specific plans for the effective management of innovation should be drafted to guide the behaviour of senior managers. This can encompass application of the 'balanced scorecard' (Kaplan & Norton 1996; 2001). The "innovation and learning perspective" within this framework can encompass specific goals and measures linked to the budget and employee remuneration. This will assist in permeating throughout the firm a culture of innovation (Kaplan & Norton 2001).

However, such planning needs to be tempered with the realities of a highly dynamic and changing market or technological environment. A criticism of formal strategic planning processes is that they tend to be linear in nature, meaning that they are designed to follow a chronological and event-based strategy usually with lengthy time horizons (Mintzberg 1987). Critics suggest that the reality of competitive markets requires organizations to be able to adapt their planning to accommodate unforeseen events and to exploit emergent strategic opportunities if they present themselves (Mintzberg & Waters 1984). Strategic planning is frequently logical, systematic and prescriptive in nature while strategic thinking is more intuitive, fluid, creative and divergent (Graetz 2002). Strategy has been likened to a 'double-loop' process (iterative and continuous), while planning has been viewed as a 'single-loop' process (Heracleous 1998).

Formal, linear planning is inconsistent with the dynamic strategic approach adopted by entrepreneurs, which involves a process of continuous screening of opportunities, the weeding out of less promising options, selection and prompt exploitation usually with only limited analysis (Bhide 1994). Whereas large firms consider options carefully and invest against clearly defined financial benchmarks, entrepreneurs act more intuitively, taking calculated risks and using creative vision and market opportunity as their guide. Sequential or linear strategic planning involves the identification of an opportunity, an evaluation of its strategic value, the formulation of strategy, commitment of resources, transfer of responsibility to an implementation team, and the implementation of the strategy. This process is generally risky in nature and involves a fairly lengthy time from conception to market acceptance. By contrast the non-linear or simultaneous process of strategic planning, sees opportunity identification, opportunity screening, resource allocation and implementation taking place concurrently and with shorter cycle times (Feurer, Chaharbaghi, & Distel 1995).

To create such non-linear strategic planning processes requires the combination of the other four key elements described so far. Close partnering with lead customers offers organizations the opportunity to develop new products and services and bring them to market quickly and with confidence of ready acceptance and eventual diffusion. Innovative leadership by senior managers of employees who are supported by an innovative culture and ambidextrous structure are more likely to embrace the dynamic and challenging requirements of non-linear strategic planning. Effective strategies must be market or customer focused with

the ability to be continuously fine-tuned in the face of external change, while also maintaining a clear focus on the core competencies that underwrite the firm's competitive advantage. Such strategies should also be clearly communicated to all key stakeholders including customers, suppliers, employees and the resource network (Nohria, Joyce & Robertson 2003).

Hewlett-Packard (HP), despite its recent challenges and restructuring has developed an enviable reputation for innovation in products. HP has made use of non-linear dynamic strategy formulation following a *"Hoshin-Kanri"* model in which strategic management responsibility is pushed down to unit level within the firm with activities guided less by centralised policy and planning, and more by a system of strategic development tools that cascade from the corporate headquarters to the divisional and unit level. Strategic management seeks to share common vision and purpose, with flexible implementation following established 'plan-do-check-act' cycles used within the Total Quality Management (TQM) system. Market or customer orientation is high and there is a strong emphasis on cross-functional teams in the business process. While HP allows a devolved level of decision-making, its strategic planning process is highly structured, formalised and systematic involving screening and evaluation of new ideas. It seeks to make each employee an innovator and a participant in the innovation cycle, while also ensuring that such activities are supported and systematically undertaken using a variety of planning and evaluation tools (Feurer, Chaharbaghi, & Wargin 1995).

An examination of the strategic decision making process of the 57 small to medium high innovator firms in Western Australia, undertaken by CEMI identified several key features of how strategy is developed by such organizations (Mazzarol, Reboud & Adam 2004). Successful returns to future investments in innovation were perceived as dependent on the value that these innovations offered to customers, and the innovator firm's expectation that their customers would view the innovation as a lucrative. Strategic innovation among such firms was driven by entrepreneurial senior managers who were closely in touch with lead customers and able to adapt innovations to suit customer needs and deliver value in terms of new sales growth, but without having to make significant changes to their existing technology base.

The decision by these small innovator firms to seek strategic partnerships with other firms likely to assist it to bring its innovation to market was found to be determined by how easily the customer could understand the new innovation and the customer's assessment of the risk and potential opportunities offered by the innovation, as well as how easily it could be integrated into their existing technologies. Further, the small innovator firm's own ability to influence the level of quality in the industry was found to play an important role. This last point is important, because this is likely to provide the small innovator firm with a degree of control over the end result. Should they feel that they couldn't control the quality, they were likely to be vulnerable when engaging complimentary actors who might adversely influence the final outcome.

In seeking to bring the innovation to market the findings suggest that the small innovator firm is likely to seek collaboration with complimentary actors where the innovation offers opportunities to the customer and can integrate with the customer's existing technologies, but where customer considers the risk associated with the innovation to be high and the customer has some difficulty understanding the innovation. Under these conditions, but where the small innovator firm feels that it can control the quality of the outcome, collaboration more likely.

Finally, the small innovator firm's decision to proceed with the innovation is likely to be determined by the level of power of the entrepreneurial manager leading the firm. Their decision will be mediated to a degree by the views of persons external and internal to the firm including the customer, other business owners and the firm's Board of Directors or senior managers. These findings support those of de Jong & Brouwer (1999) who suggest that the determinants of innovation in small firms are the characteristics of the entrepreneur, the innovation infrastructure that exists within the firm (e.g. culture, systems, resource), and the market's

acceptance or demand for innovation. Within these findings the importance of the top entrepreneurial manager is highlighted, as is their focus on the needs of the leading customer and the ease with which they can get such a customer to adopt the innovation.

CONCLUSIONS

This paper has sought to present a model of for the creation of innovative organizations. It suggests that there are five key determinants for such organizational outcomes, specifically a strong market or customer orientation, strong innovation focused leadership, an innovation supportive culture, a flexible ambidextrous structure, and a non-linear strategic planning process that allows for dynamic change and adaptive responses to market forces. Through the examples provided from the literature, and the evidence from studies of highly innovative firms in Western Australia, there is evidence to support this framework.

Managers of organizations, both large and small, who seek to achieve enhanced levels of innovation, should consider these five elements and their ability to shape their own firm to accommodate their requirements. While most business organizations are likely to consider they possess a strong market or customer orientation, it is more problematic that they will possess the other four elements. Discussions over several years with the managers of many large and small organizations comprising the government, private and non-profit sector, suggest that few have a well-balanced framework comprising all five elements.

Creating the innovative organization is a strategic process that will be measured in years rather than months. It will require attention to be paid to both the hard and soft systems at work within the firm, and its success will require courage, vision and the capacity to lead change and reshape the attitudes of customers, suppliers, employees and other key stakeholders.

REFERENCES

AMC (1994). Leading the Way: A Study of Best Manufacturing Practice in Australia and New Zealand. Melbourne, Australian Manufacturing Council.

AMC (1994). The Wealth of Ideas: How Linkages Help Sustain Innovation and Growth. Melbourne, Australian Manufacturing Council.

AMC (1995). The Innovation Cycle: Practical Tips from Innovative Firms. Melbourne, Australian Manufacturing Council.

Arias, J. T. G. (1995). "Do Networks Really Foster Innovation?" Management Decision **33**(9): 52-56.

Bhide, A. (1994). "How Entrepreneurs Craft Strategies that Work." Harvard Business Review **March-April**: 150-161.

Burgelman, R. A. (1984). "Managing the Internal Corporate Venturing Process." Sloan Management Review(Winter): 33-48.

Burns, T., & Stalker, G.M. (1961). The Management of Innovation. London, Tavistock Publications.

Crosby, M. (2000). "Patents, Innovation and Growth." Economic Record **76**(234): 255-262.

de Jong, J. P. J., & Brouwer, E. (1999). Determinants of the Innovative Ability of SMEs: Literature Review. Zoetermeer, EIM Small Business Research and Consultancy.

Dosi, G. (1982). "Technological Paradigms and Technological Trajectories." Research Policy **11**(3): 147-162.

Drucker, P. (1985). Innovation and Entrepreneurship. Oxford, Butterworth-Heinemann.

Echeverri-Carroll, E. L. (1999). "Knowledge Flows In Innovation Networks: A Comparative Analysis of Japanese and US High-Technology Firms." Journal of Knowledge Management **3**(4): 296-303.

Farson, R., & Keyes, R. (2002). "The Failure Tolerant Leader." Harvard Business Review **80**(8): 64-72.

Feurer, R., Chaharbaghi, K., & Distel, M. (1995). "Dynamic Strategic Ownership." Management Decision **33**(4): 12-21.

Feurer, R., Chaharbaghi, K., & Wargin, J. (1995). "Analysis of Strategy Formulation and Implementation at Hewlitt-Packard." Management Decision **33**(10): 4-16.

Foster, W. K., & Pryor, A.K. (1986). "The Strategic Management of Innovation." The Journal of Business Strategy **7**(1): 38-42.

Graetz, F. (2002). "Strategic Thinking Versus Strategic Planning: Towards Understanding the Complimentarities." Management Decision **40**(5/6): 456-462.

Gresov, C. (1984). "Designing Organizations to Innovate and Implement: Using Two Dilemmas to Create a Solution." Columbia Journal of World Business **3**(Spring): 63-67.

Grupp, H., & Maital, S. (2001). Managing New Product Development and Innovation: A Microeconomic Toolbox. Cheltenham UK; Northampton USA, Edward Elgar.

Henderson, R., & Clark, K. (1990). "Architectural Innovation: the reconfiguration of existing product technologies and the failure of established firms." Administrative Science Quarterly **35**(1): 9-30.

Heracleous, L. (1998). "Strategic thinking or strategic planning?" Long Range Planning **31**(3): 481-487.

Hogberg, C., & Edvinsson, L. (1998). "A Design for Futurizing Knowledge Networking." Journal of Knowledge Management **2**(2): 81-92.

Holmlund, M., & Tornroos, J-A. (1997). "What Are Relationships in Business Networks?" Management Decision **35**(4): 304-309.

ISR (2001). Commonwealth and State Government Programs Supporting Innovation in Firms. Canberra, Department of Industry, Science and Resources, Commonwealth of Australia, AGPS.

Kanter, R. M. (1982). "The Middle Manager as Innovators." Harvard Business Review **60**(4): 374-386.

Kaplan, R., & Norton, D. (1996). "Using the Balanced Scorecard as a Strategic Management System." Harvard Business Review **74**(1): 75-85.

Kaplan, R., & Norton, D. (2001). "Transforming the Balanced Scorecard from Performance Measurement to Strategic Management: Part 1." Accounting Horizons **15**(1): 87-104.

Kaplan, R., & Norton, D. (2001). "Transforming the Balanced Scorecard from Performance Measurement to Strategic Management: Part II." Accounting Horizons **15**(2): 147-160.

Kodama, M. (2002). "Transforming an Old Economy Company into a New Economy Success: The Case of NTT DoCoMo." Leadership & Organization Development Journal **23**(1): 26-39.

Laredo, P., & Mustar, P. (1996). The Technoeconomic Network: A socioeconomic approach to state intervention in innovation. Technological Collaboration: The Dynamics of Cooperation in Industrial Innovation. R. Coombs, Richards, A., Saviotti, P. and Walsh, V. Chelteham, Edward Elgar**:** 143-164.

Mazzarol, T., Reboud, S., & Adam, D. (2004). Innovation Strategy in Small Firms: Innovation and Strategic Decision Making within Small to Medium Enterprises. Centre for Entrepreneurial Management and Innovation-Centre for Business Research, Graduate School of Management, University of Western Australia, Perth.

Mazzarol, T. W. (2003a). Innovation Linkages: Strategic Networks and Alliances within the Western Australian ICT Sector. Perth, Centre for Entrepreneurial Management and Innovation, Graduate School of Management, University of Western Australia**:** 101.

Mazzarol, T. W. (2003b). "Strategic Networking Among High Technology Firms: Evidence from the Western Australian ICT Sector." ANZAM 2003 Conference, 2-5 December, Fremantle, Western Australia.

Mazzarol, T. W. (2004). Industry Networks in the Australian Marine Complex: Strategic Networking within the Western Australian Maritime Engineering Sector. Centre for Entrepreneurial Management and Innovation, Graduate School of Management, University of Western Australia, Perth.

Miller, W. (2001). "Innovation for Business Growth." Research Technology Management **66**(September-October): 26-41.

Miller, W. L., & Morris, L. (1999). 4th Generation R&D: Managing Knowledge, Technology, and Innovation. New York, John Wiley & Sons Inc.

Mintzberg, H. (1987). "Crafting Strategy." Harvard Business Review **65**(4): 66-75.

Mintzberg, H., & Waters, J. (1984). Of Strategies, Deliberate and Emergent. Readings in Strategic Management. Milton Keynes, Open University Press.

Molyneux, A. (2000). "Innovation: The view from the Summit." Australian CPA **70**(3): 24-25.

NCOE (2000). Embracing Innovation: Entrepreneurship and American Economic Growth. Washington D.C., National Commission on Entrepreneurship White Paper.

Nohria, N., Joyce, W., & Robertson, B. (2003). "What Really Works." Harvard Business Review **81**(7): 43-52.

Nonaka, I. (1991). "The Knowledge Creating Company." Harvard Business Review **6**: 96-104.

Nonaka, I., & Takeuchi, I. (1995). The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation. New York/Oxford, Oxford University Press.

O'Reilly, C. A., & Tushman, M.L. (2004). "The Ambidextrous Organization." Harvard Business Review **82**(4): 74-81.

Pearson, A. E. (1988). "Tough-Minded Ways to Get Innovative." Harvard Business Review(May-June): 99-106.

Pfeffer, J. (1994). "Competitive Advantage Through People." California Management Review(Winter): 9-28.

Pinchot, G. (1987). "Innovation Through Intrapreneuring." Research Management **30**(2): 14-19.

Polanyi, K. (1957). The Great Transformation. Boston, Beacon Press.

Quinn, J. B. (1980). "Managing Strategic Change." Sloan Management Review (Summer): 3-2.

Quinn, J. B. (1985). "Managing Innovation: Controlled Chaos." Harvard Business Review (May-June): 73-84.

Sakkab, N. Y. (2002). "Connect & Develop Compliments Research & Develop at P&G." Research Technology Management **March-April**: 38-45.

Savery, L., & Mazzarol, T. (2000). Intrapreneuring - An HRM Success Strategy for the next Millennium. Human Resource Strategies: An Applied Approach. T. Travaglione, and Marshall, V. (Eds). Sydney, McGraw-Hill**:** 159-180.

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.

Seufert, A., von Krogh, G., & Bach, A. (1999). "Towards Knowledge Networking." Journal of Knowledge Management **3**(3): 180-190.

Sonnenberg, F. K. (1991). "Strategies for Creativity." The Journal of Business Strategy (January-February): 50-53.

Stringer, R. (2000). "How to Manage Radical Innovation." California Management Review **42**(4): 70-88.

Sundbo, J. (1998). The Theory of Innovation: Entrepreneurs, Technology and Strategy. Cheltenham, UK, Edward Elgar.

Sundbo, J. (2001). The Strategic Management of Innovation: A Sociological and Economic Theory. Cheltenham UK. Northampton, MA, United States, Edward Elgar.

Takeuchi, H., and Nonaka, I. (1986). "The New Product Development Game." Harvard Business Review (January-February): 137-146.

Tushman, M., and Nadler, D. (1986). "Organizing for Innovation." California Management Review **28**(3): 74-92.

VanDenVen, A. (1986). "Central Problems in the Management of Innovation." Management Science **32**(5): 590-607.

Wolpert, J. D. (2002). "Breaking Out of the Innovation Box." Harvard Business Review **August**: 3-8.