Organisational Innovation

A review of the literature

Catherine Maughan

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For additional information please contact

Ninti One Limited
Communications Manager
PO Box 154, Kent Town
SA 5071
Australia

Telephone +61 8 8959 6000 Fax +61 8 8959 6048

www.nintione.com.au

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Catherine Maughan

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Executive summary

Australia is committed to 'closing the gap' in disadvantage in remote Australia. The question for agencies, organisations and businesses is how to close the gaps that have grown over the past 200 years. What is required is 'something *truly different* in the market that makes your customers' lives better' (Baum 2004). While not all innovations will result in something truly different, probability informs us that the greater the number of innovations the greater the chance of solving the complex problems of remote Australia.

The single most important factor in a company's level of innovation competence is building an *innovative culture* that has *total leadership commitment*. In providing the right climate for innovation, leaders need to challenge and involve employees by committing to a *big problem*. Leaders also need to motivate, inspire and direct followers, overcome intra-organisational obstacles, and promote organisational innovation.

Management innovation, more than any other kind of innovation, has allowed companies to cross new performance thresholds. The dramatic shifts in competitive advantage have come, not as a result of technology and product innovation, but as a result of innovation in *management principles and processes* that create long-lasting advantage.

Innovative companies have *institutionalised innovation* as a core value. These companies believe that ideas can come from anywhere within the company, not just R&D personnel, so innovative companies have found ways to free their innovators.

Organisations that have achieved innovation have had to alter their *organisational design* depending on the nature of the industry and their own goals. Companies have moved to designs that have multi-disciplinary approaches and greater flexibility and autonomy.

Innovation is characterised by greater uncertainty and variability. Consequently, innovative companies put in place *human resource management* policies and practices that recruit, train and keep employees who are flexible, risk-takers, tolerate uncertainty and ambiguity and who are driven by intrinsic motivation.

Research into *partnerships between research organisations and business* identified a number of critical success factors, including strong leadership and a project champion, two-way licensing of technologies, improving organisational asymmetry, developing contracts that ensure intellectual property is fairly shared and developing metrics to measure success.

Innovative companies have accessed and exploited knowledge from outside their organisations through an approach known as *open innovation*. By broadcasting research problems to outsiders, R&D productivity can increase by as much as 60%.

Internationally, *Indigenous approaches to innovation* and wealth creation differ in challenging ways from Western stereotypes of the entrepreneurial process. Consequently, Indigenous knowledge usually exists alongside western knowledge and there is a lack of linkages between the two. However, there is a view that an emerging sub-field of Indigenous entrepreneurship research will offer new insights and expand the definition of what it means to be innovative.

Introduction

What is the difference between innovation and research and development (R&D)? According to Baum (2004), CEO of Dial, 'R&D means *improvements* to existing products, quality assurance, line extensions. Innovation is something *truly different* in the market that makes your customers' lives better.' Prather (2010) adds that 'innovation is a *social process* requiring an effective team to bring a good idea to fruition in the marketplace.'

Prather's (2010) experience leading the DuPont Center for Creativity and Innovation led him to develop the Innovative Competence Model consisting of the three arenas of education, application and leadership. Developing an internal competence for innovation requires a systemic approach in all three arenas. DuPont initially concentrated on the education and application arenas and naively assumed that the leaders would know how to lead it. 'We know now that *total leadership commitment* from the top is the *single most important factor* in a company's level of innovation competence and its innovation success' (Prather 2010).

Hamel (2006) agrees that leadership is vitally important because he believes it is innovation in *management principles and processes* that create long-lasting advantage and produce dramatic shifts in competitive position. By comparison, technology and product innovation tend to deliver small-calibre advantages. Hamel's elements of management innovation are:

- Commitment to a big management problem
- Novel principles that illuminate new approaches
- A deconstruction of management orthodoxies
- Analogies from atypical organisations that redefine what's possible (Hamel 2006).

The role of the leadership team is to provide the right environment for employees to be innovative because it is people, not organisations, who come up with the innovative ideas. This report is a review of the literature on organisational and management innovation. The discussions begin with a systems model of the innovation value chain, which is followed by discussion of internal factors such as management innovation, leadership, organisational culture, organisational design and human resource management. The discussion then moves to innovation involving interaction between the organisation and the external environment. External interactions include partnerships between R&D organisations and businesses, interactions between consumer/customer and researcher, open innovation strategies and the recent international development of an Indigenous entrepreneurship research paradigm. The paper concludes with a model for implementing an innovation framework within a public-good research organisation.

Innovation value chain

Hansen & Birkinshaw (2007) maintain that there is no universal solution for improving innovation in organisations. They believe that management needs to take an end-to-end view of their innovation efforts, pinpoint their particular weaknesses, and tailor innovation best practices as appropriate to address the deficiencies.

The innovation value chain offers a framework that breaks innovation down into three phases (idea generation, conversion, and diffusion) and six critical activities (internal, cross-unit, and external sourcing; idea selection and development; and spread of the idea) performed across those phases.

	IDEA GENERATION			CONVERSION		DIFFUSION
	IN-HOUSE Creation within a unit	CROSS-POLLINATION Collaboration across units	EXTERNAL Collaboration with parties outside the firm	SELECTION Screening and initial funding	DEVELOPMENT Movement from idea to first result	SPREAD Dissemination across the organization
KEY QUESTIONS	Do people in our unit create good ideas on their own?	Do we create good ideas by working across the company?	Do we source enough good ideas from outside the firm?	Are we good at screening and funding new ideas?	Are we good at turning ideas into viable products, businesses, and best practices?	Are we good at diffusing developed ideas across the company?
KEY PERFORMANCE INDICATORS	Number of high-quality ideas generated within a unit.	Number of high-quality ideas generated across units.	Number of high-quality ideas generated from outside the firm.	Percentage of all ideas generated that end up being selected and funded.	Percentage of funded ideas that lead to revenues; number of months to first sale.	Percentage of penetration in desired markets, channels, customer groups; number of months to full diffusion.

Figure 1: The Innovation Value Chain: An Integrated Flow

Source: Hansen & Birkinshaw 2007

Using the innovation value chain, management can identify the organisation's weaknesses and, as a result, be more selective about which innovation tools and approaches to implement. For example, an IT company with good ideas for new products and businesses did not have a process for selecting and developing the best ideas and killing the others. The engineers became increasingly frustrated seeing their creative talents not materialising and the brainstorming sessions that management implemented to help mend the relationship with the engineers only made things worse. Failure to identify the weak link (idea selection) and focusing more time and resources on the strong link (idea generation) ultimately undermined the company's innovation efforts (Hansen & Birkinshaw 2007).

Hansen & Birkinshaw (2007) believe that managers need to focus on strengthening their weak links because a company's capacity to innovate is only as good as the weakest link in its innovation value chain. They found that:

- Idea-poor companies fail to forge quality links and networks with people outside their organisation and outside their own departments or divisions. Companies need to build external networks as well as internal cross-unit networks. Several of the companies discussed in the article used different methods of 'posting' problems (both internally and externally) that need solutions.
- Conversion-poor company systems for managing ideas are often so bureaucratic and risk-adverse that execution grinds to a halt. Multi-channel funding and safe havens are seen as two solutions. Shell Oil's GameChanger unit funds the development of radical ideas that otherwise may not have been funded.
- Diffusion-poor companies tend to have managers who delay or sabotage products that they don't believe in. Executive need to create 'buzz' for new concepts and the 'idea evangelist' is someone who uses their personal networks to increase awareness among employees and convince them to support a new product or business concept (Hansen & Birkinshaw 2007).

Proctor & Gamble have an 'ask me' section on their intranet where employees can describe a business problem or need which then gets posted out to its 10,000 employees worldwide.

Using the innovation value chain framework requires constant monitoring of each link in the chain in order to continually improve the whole. New key performance indicators that focus on the specific deliverables from each link will need to be developed and implemented. This framework also requires the cultivation of new roles for employees such as external scouts (Siemens), internal idea brokers (P&G), internal venture capitalists (Shell), project champions (Tenco) and internal evangelists (Sara Lee) (Hansen & Birkinshaw 2007).

Management innovation

Hamel (2006) believes that over the past 100 years it is management innovation, more than any other kind of innovation, that has allowed companies to cross new performance thresholds. He defines management innovation as 'a marked departure from traditional management principles, processes, and practices or a departure from customary organisational forms that significantly alters the way the work of management is performed'.

Management MUST Be Reinvented
In this You Tube clip, Gary Hamel shares his view that 'management' itself needs to be reinvented in order to accommodate the new needs of business. Although technology has evolved and productivity has increased at a dramatic rate, management has remained almost unchanged.

Using Whirlpool as an example, Hamel (2006) describes the key changes that the company employed that reinvented the company's management processes:

- making innovation a central topic in leadership development programs
- allocating a substantial share of annual capital spending for innovative projects
- training more than 600 people to be innovation mentors for employees
- enrolling all employees in an online business innovation course
- establishing innovation as a large part of top management's long-term bonus plan
- allocating time in business review meetings for an in-depth discussion of each unit's innovation performance
- building an innovation portal for employees to access a compendium of innovation tools and data
- developing a set of metrics to track innovation inputs, throughputs and outputs.

While not every management innovation will result in competitive advantage, Hamel (2006) states that is not an excuse not to innovate because the more you are innovative the greater the chance of reaping a huge return. To boost innovation efficiency, successful innovators raise the ratio of:

- innovators to the total number of employees
- radical innovation to incremental innovation
- externally resourced innovation to internally resourced innovation
- learning over investment in innovation projects
- commitment over the number of key innovation priorities (Hamel & Getz 2004).

Whirlpool did not make all these changes at once. The process started in 1999 when the Chairman and CEO issued a challenge to his leadership team to 'turn Whirlpool into a font of rule-breaking, customer pleasing innovation' (Hamel 2006).

Leadership

Leadership is defined not by power but by the capacity to increase the *sense of power* among those who are led. Therefore, the most important work of the leader is to create more leaders (Hamel 2006). In building an innovative culture, *total commitment* to, and leadership in, innovation needs to come from the very top of the organisation.

Innovation at Procter & Gamble

This You Tube clip shows a Harvard Business interview with AG Lafley, Chairman and CEO of Procter & Gamble. Innovation is at the core of P&G's business strategy. See how P&G makes innovation an everyday practice in their organisation.

According to Prather (2010) the working climate that the leaders create is the single biggest factor governing the success of the organisation's total innovation effort. In providing the right climate for innovation, leaders need to ensure that employees are *challenged and involved*. Hamel (2006) believes the organisation needs to commit to a '*big problem*'. He says that while big problems do not always provide big breakthroughs, little problems never do. Solving big problems requires fortitude, perseverance and imagination, and these qualities are most abundant when a problem is both important *and* inspiring. If

employees' jobs are challenging and employees are highly involved in problem solving this will facilitate *intrinsic motivation*, which leads people to create and innovate because they are inspired. Therefore, the leaders need to communicate a clear and *compelling challenge* that team members want to adopt as their own, as this creates the need for innovative thinking and action (Prather 2010).

As innovation requires a high level of input from employees, the organisation should consider the ways in which employees can have greater input into *decision making*, especially that which affects their work. A high level of participation creates an environment that encourages employees to bring new ideas and to *exchange knowledge* in the ongoing innovation process that enhances innovative outcomes (Chen & Huang, 2009).

Hamel & Getz (2004) also suggest that a company should commit itself to a relatively small number of medium-term innovation goals and to measure how persistently the company pursues success. The key to goal setting is to have goals that are big enough to be compelling, yet practical enough to be credible; goals should be broad enough to invite contributions from across the firm and beyond, yet specific enough to provide focus. Such goals have the power to multiply individual efforts (Hamel & Getz 2004).

A study by Elenkov & Manev (2005) highlighted the importance of integrating the concepts of top-level *leadership*, strategic *innovation* and executive *cultural intelligence*. Cultural intelligence focuses on a person's ability to be adaptive and responsive to cultural diversity and culture-specific situations. This ability essentially incorporates knowledge and skills in processing and embracing cultural differences through heightened sensitivity of diversity in background, heritage, language, and symbolic meanings.

Top-level managers influence product/market innovation and organisational innovation in different ways. While product/market innovation is essentially discrete, organisational innovation is most often associated with a continuous process that spreads through the entire organisation. Elenkov & Manev (2005) found that a *heightened cultural intelligence* appears to magnify the positive effect of top-level leadership on *executives' influence on organisational innovation*. Culturally diverse contexts require corporate leaders to interact and empathise with followers with different backgrounds and identities. Executives with higher CQ (measure of cultural intelligence) are likely to motivate, inspire, and direct followers more effectively, overcome intra-organisational obstacles, and promote organisational innovation.

In addition, leadership has a large impact on the culture of the organisation. Innovative organisations are not led by people who maintain the status quo.

Organisational culture

Hamel & Getz (2004) believe that companies need to *institutionalise innovation* as a core value. They also believe that ideas can come from anywhere within the company, not just R&D personnel. Consequently it is necessary to 'free your innovators'. Companies, such as Gore, that have totally embraced an innovation policy have moved into very diverse areas, as well as being one of America's most highly rated employers (Hamel & Getz 2004).

Another American company, Dial, has embarked on an innovation campaign that extends from scientist to secretaries. Innovation is now a core value and the company encourages and *rewards* innovative employees. Firstly, they changed the name of the R&D Center to the Center for Innovation and created a Vice President of Innovation who reports directly to the CEO. To encourage internal innovation, the company holds an annual innovation day where all employees can learn about creativity and generate ideas. Employees are given awards for innovation and scientists are required to develop two new patentable ideas per year. Dial also solicits outside ideas through a competition that is published through inventors' organisations and publications (Baum 2004).

However, developing an innovative culture is much more than offering a few rewards for innovative behaviour. For example, Thompson & Heron's (2006) research looked at links between three dimensions of the employment relationship – the psychological contract, affective commitment and knowledge-sharing behaviours – and their consequences for innovative performance. The results suggest that organisations that invest heavily in *socialisation* of employees, and enact policies and practices to forge strong *personal identification* with the organisation and its values and purpose may be better placed to appropriate value from knowledge worker behaviour.

Prather (2010) agrees that human factors are critically important in the innovation process but adds that they need the right work environment.

Together with innovation, core values need to include trust, openness, freedom and risk taking. Risk taking is rarely encouraged as it is often perceived to increase the risk of mistakes being made. In the 'trust and openness loop' (Figure 2) the 'mistake' is acknowledged and the focus is on learning, so that the next attempt will have a better chance of success. Trust and openness are both variables and each is the cause and effect of the other. Openness always comes first and comes from the leader. It means being transparent, sharing as much information as possible and admitting mistakes (Prather 2010).

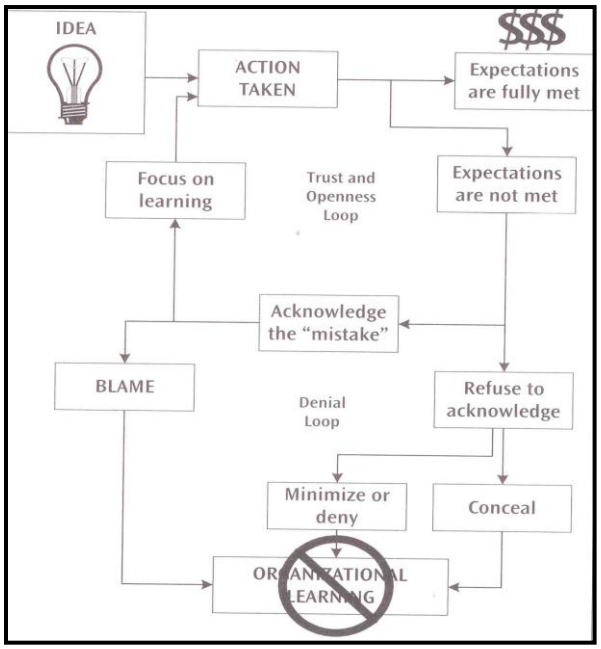

Figure 2: Two ways organisations handle mistakes

Source: Prather 2010

Prather (2010) suggests that when learning is the focus, the whole organisation becomes smarter and the next attempts are more likely to work. Leaders should lead by example and be the first to admit past managerial mistakes to the team and engage them in discussion of what went wrong, so that everyone learns.

Newman (2009) developed the acronym CREATIVE to describe the elements needed to develop an innovative R&D culture. CREATIVE stands for **C**ustomer-focused, **R**isk-tolerant, **E**ntrepreneurial, **A**lignment with strategy, **T**echnology and scientific excellence, **I**nnovative, **V**irtual organisation (Collaboration) and **E**xecution. Establishing innovative culture is a challenging, long-term task and is not achieved through a single seminar, tool or program. There are no simple techniques that can create this culture and make changes in intrinsic values. Figure 3 shows a possible outline of a plan for R&D culture development.

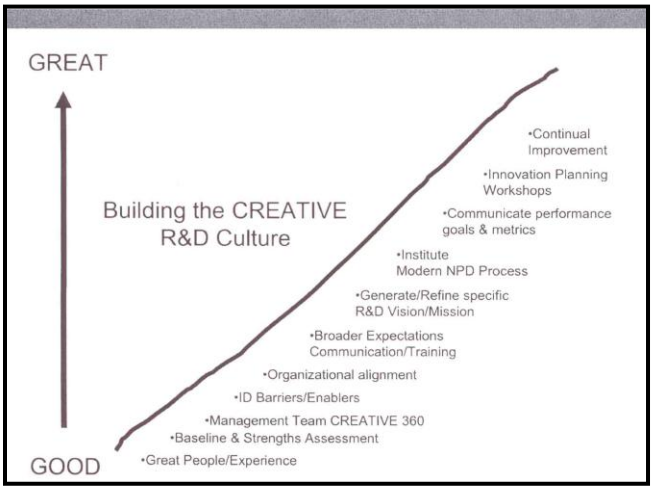

Figure 3: Building the CREATIVE R&D Culture

Source: Newman 2009

The culture of an organisation is also shaped by its design. For example, bureaucracies and hierarchies often work to suppress creativity and innovation and therefore may not be conducive to fostering an innovative culture within the organisation.

Organisational design

Organisational structures that may have worked well in the past are not suitable when an organisation's goal is to be innovative and creative. Bureaucracy generally sets an upper limit to what employees are allowed to do in their work, which inhibits creativity and innovation. Organisations that have achieved innovation have changed their organisational design depending on the nature of the industry and their own goals.

Garnier (2008) believes that it is necessary to return power to the researchers by reorganising R&D into small, highly focused groups headed by people who are leaders in their scientific fields and can guide and inspire their teams to achieve greatness. For example, at GSK the organisational pyramid was broken into a constellation of highly focused centres of excellence designed to improve transparency, increase the speed of decision making, and restore freedom of action to the scientists actually conducting the research.

American company Gore has virtually no hierarchy and associates (employees) can spend up to 10% of their time dreaming up new applications for the company's unique products. When an idea emerges the innovator has to recruit colleagues to support its development. Gore's democratic innovation policy has seen the company move into very diverse areas, as well as being one of America's most highly rated employers (Hamel & Getz 2004).

Some organisations have successfully achieved innovation through creating new teams or expertise departments. For example, Bank of America developed a corporate unit called the Innovation &

Development (I&D) team whose immediate goal was to pioneer new service delivery techniques that would increase customer satisfaction while achieving a high degree of efficiency in transactions (Thomke 2003). Some pharmaceutical companies have restructured their R&D departments by grouping experts into expertise departments responsible for developing cross-project capitalisation and cross-fertilisation. For example, Roche used an *iterative communication process* between researchers from different disciplines who could make sense of the immense amount of data being generated by the biotechnological revolution and turn it into a shortlist of best prospects for further research. This level of multidisciplinary approach to hard-to-understand science demands flexible teams. Roche formed *eclectic discovery teams* – ad hoc combinations of research experts in complementary fields, ranging from genetics to bio-informatics (Charue-Duboc, 2006).

Organisations need strategies for managing the control/creative R&D trade-off such as:

1. Allowing staff to have time out from dedicated, supervised work e.g. 5–10%
2. Placing staff within the R&D unit who remove the administrative burdens
3. Zoning of R&D within the firm, which allows some research groups, units and locations to have much looser supervisory control than others (Howells 2008).

R&D is constantly evolving in terms of the way R&D is organised. Firms have to operate much more flexible and permeable R&D structures. The increasing complexity of R&D organisation is, however, not just in terms of organisational forms, it is also in terms of how firms organise their human resources within the context of R&D (Howells 2008).

Human resource management

Using the Kai Creativity Scale - Dr. Charles Prather

This You Tube clip shows that everyone is creative, but people's creative style is different and creativity style determines what jobs you prefer. Prather discusses the principles of partnering with someone whose style is different from your own to enhance job performance.

Establishing an innovation climate requires appropriate policies and practices with respect to people and work. Effective HR practices in terms of staffing, training, participation, performance appraisal, and compensation enhance a firm's capability in introducing new products, services, and management systems, leading to better innovation outcomes (Chen & Huang 2009). As innovative firms are characterised by greater uncertainty and variability, firms need to recruit, train and keep employees who are *flexible*, *risk takers*, tolerant of *uncertainty* and *ambiguity* (Chen & Huang 2009), driven by *intrinsic motivation* and who possess a *cognitive style* (Herrera et al. 2010).

Training

Hamel & Getz (2004) believe that companies need to 'get radical' and come up with radical ideas that 1) change customer expectations or behaviours, 2) change the basis of competitive advantage or 3) change industry economics. To generate radical ideas people have to be taught to look beyond the conventional, that is, they have to be given the skills to innovate. For example, all Whirlpool employees are required to complete a course on the basics of business innovation. They are also encouraged to call upon the 500+ specifically trained innovation mentors.

As innovation can come from all levels within the organisation, innovative training is worthwhile for all employees (Chen & Huang 2009). While providing the right training gives employees the skills and tools to be innovative, these by themselves will not motivate the employee. For innovation to flourish, people need to be *intrinsically motivated* to perform (Prather 2010).

Employee motivation and job satisfaction

Herzberg's pioneering work on employee motivation in the 1950s and 1960s identified a set of hygienic factors and a separate set of motivating factors that *work together* to create job satisfaction (Prather 2010). Providing the hygienic factors (pay and benefits, job security, status, company policy and administration, relationships with co-workers, physical environment and supervision) does not result in job satisfaction but rather *not dissatisfaction*. Once all the hygienic factors are provided, an employee's level of job satisfaction will be a direct result of the motivating factors. Herzberg identified the motivating factors as *achievement, recognition, work itself, responsibility, advancement* and *growth*.

Innovation cannot flourish in a climate of job dissatisfaction where people do the minimum to keep their jobs. To foster an innovative culture both individual and team innovation *behaviours* (such as creativity, risk-taking attitude and problem-solving ability) and *output* (implementation of new goods and services) need to be recognised and rewarded. Consequently, desired behaviours and outputs need to be identified and measured (Chen & Huang 2009).

Partnerships between public-good research organisations and business

According to Preissl (2006) one of the outcomes from public-good research organisations is the 'creation of knowledge and competences – *competence building* – that lead to sustainable innovative capabilities in the innovating company'. Preissl (2006) argues that competence building is a *two-way process* of mutual knowledge exchange which offers gains to both the research organisation and the end-users; yet traditionally, public-good research organisations have presented research findings in academic publications, a *one-way process*. The essential finding of the competence-building research is that in a service economy the modes of delivery, that is, the organisation of the *customer/supplier interface*, are of crucial importance for the efficiency and effectiveness of the development of dynamic capabilities and innovation competences (Preissl 2006).

An example of a public and private research partnership is South Carolina's Centre of Economic Excellence (CoEE). The CoEE combined State and non-state money to establish advanced research centres at three senior research universities. In six years CoEE has attracted nearly a quarter of a billion dollars in outside investment and created more than 2,000 jobs (Murray 2009). The CoEE presents a unique investment for private companies in that the State matches dollars, which effectively means an instant doubling of a company's investment. In addition, the company saves R&D costs because of the university's existing knowledge and infrastructure. Because the CoEE Program is centred on innovative research with a high potential for commercialisation, corporate investors expect the research will ultimately lead to revenue growth and increased competitiveness (Murray 2009).

Kleyn & Kitney (2007) researched the nature of R&D collaborations in universities and BioPharma companies and the extent of involvement in the partnering process. The research identified a number of critical success factors for these partnerships, which include:

1. Strong leadership – both companies and universities stressed that the leader/internal *project champion* is the most important success factor for the partnership
2. Developing two-way interactions – reciprocal relationships where groups provide specialist skills or resources needed for the project and *two-way licensing* of technologies to enhance research capability in both organisations
3. Improving organisational asymmetry – universities are generally used to working with research councils and charities, hence their *systems* are not well organised to deal with commercial organisations
4. Developing partnership contracts and agreements – that are more conducive to the exchange of information and ideas (critically important in innovation) while ensuring *intellectual property* arising from these interactions is fairly shared
5. Developing metrics to measure success – these were limited, which made it difficult to ascertain if partnering activities were making a difference.

It is clear that the researcher/customer interface is a particularly important partnership for public-good research organisations.

The researcher/supplier/consumer interface

Organisations that systematically involve 'lead-users' in their R&D process can reap a considerable competitive advantage (Howells 2008). Howells (2008) predicts that new forms of R&D organisations will include 'consumer-engaged research units' where the facility works directly with key consumers, either personal or industrial consumers.

According to Ulwick (2002), the process of innovation begins with identifying the outcomes that customers want to achieve and ends in the creation of products or services that they will buy. Rather than asking customers for *solutions* they should be asked for *outcomes*, that is, what they want a new product or

service to do for them. Ulwick (2002) believes that the traditional approach of asking customers for solutions undermines the innovation process because listening too closely to customers can lead to:

- the tendency for incremental, rather than bold, improvements
- customers ask for missing features that other products already deliver
- customers not wanting or needing the 'new and improved' features.

Cordis, a company that makes medical devices, used a five-step process to ask customers about outcomes that addressed important, unsatisfied needs in new market segments. The process Cordis used was:

- Step 1. Plan outcome-based customer interviews – these deconstruct, step-by-step, the underlying process or activity associated with the product or service
- Step 2. Capture desired outcomes – requires a moderator who can distinguish between outcomes and solutions
- Step 3. Organise the outcomes – create logical groupings
- Step 4. Rate outcomes for importance and satisfaction – quantitative assessment done by customers
- Step 5. Use the outcomes to jump-start innovation (Ulwick 2002).

Open innovation and open technology

Henry Chesbrough – Open Innovation

In this You Tube clip, Henry Chesbrough describes the basics of open innovation.

Closed innovation embraces a strategy of vertical integration and exclusive control. While this paradigm worked well for most of the twentieth century, Chesbrough (2003) argues that this isolationism stifles innovation. Open innovation allows organisations to access and exploit *outside knowledge* while liberating their own *internal knowledge* for others' use. Open innovation is an approach that uses tools such as licensing, joint ventures, and strategic alliances to bring the benefits of free trade to the flow of new ideas. By systematically opening their innovation borders to vendors, to customers, and even to competitors, businesses are increasing the import and export of novel ideas. As they do so, they improve the speed, cost, and quality of innovation.

Drawing data from Andover, a company that posts corporate R&D problems for outsiders to solve, Lakhani & Jeppesen (2007) found that in 30% of cases, problems that could not be solved by experienced corporate research staff were cracked by non-employees. They found the following key points:

1. problems should be broadcast to people in varied fields
2. prize money is an important motivator but so is the enjoyment of taking on a novel problem
3. insiders remain important for determining which problems should be broadcast and which potential solutions are best, as well as helping to implement the solutions.

Lakhani & Jeppesen (2007) also believe that it is possible, at least theoretically, to post problems internally. However, they believe it is more effective to encourage a diverse group of researchers from

outside the company or discipline to seek innovative solutions than to waste resources vainly looking for the right people to solve their trickiest problems.

Proctor & Gamble (P&G) used an open innovation approach by forming a network of scientific collaborations outside the internal R&D organisation. The company created the Connect and Develop (C&D) innovation model, focusing on the vision to identify promising ideas throughout the world and apply the internal R&D capability to develop better and less expensive medicines, faster. Through the C&D almost half of the development candidates had key elements discovered externally, the R&D productivity increased by almost 60% and the innovation success rate more than doubled. Costs of innovation fell from 4.8% in 2000 to 3.4% in 2005 (Favato & Mills 2006).

While there are dangers of sharing innovations, Rigby and Zooko (2002) believe these are manageable. Generally, the greatest danger lies not in the transfer of the innovation but in the *structure of the deal*. Dangers can be minimised when:

- a strong *central organisation* directs and controls outside research projects
- *experts* handle the *transactions* that enable open-market innovation such as law, licensing, patents, venture capital, alliances, research agreements, etc
- *decision processes* that demand outside data are *formalised*.

Indigenous knowledge and entrepreneurship

Hindle & Moroz (2009) state that many aspects of Indigenous approaches to innovation and wealth creation differ in challenging ways from established Western stereotypes of entrepreneurial process. Modern entrepreneurship is focused upon the commercialisation of innovation, while a prime motive in Indigenous nations' (both Aboriginal and Torres Strait Islander Australians' and Native Americans') desire for self-determination is the preservation of heritage. However, 'there need be no paradox, no contradiction, no values sacrifice, no false dichotomy between heritage and innovation' (Hindle & Lansdowne 2005).

Research in developing countries indicates that traditional or Indigenous knowledge usually exists alongside Western knowledge and there is a lack of linkages between the two. Forje (2006, cited in Wamae 2009) observes that 'Indigenous knowledge, innovation, and creativity were not catapulted into the formal productive sector.'

In some of the more advanced developing countries, the use of Indigenous knowledge appears to be more widespread than in other developing countries. This is perhaps owing to better articulation of Indigenous and Western knowledge in the more advanced developing countries. An illustration of this point is provided in the box, on traditional Chinese medicine. It is noteworthy that the ability of the Chinese to integrate components of Western knowledge into their traditional knowledge has promoted the commercialisation of Indigenous knowledge, including in developed countries.

> ***The successful commercialisation of traditional Chinese medicine*** *across the world may be related to the ability to integrate it into modern forms of commercialisation. Chinese traditional medicine has filled a specific niche in the market. It uses modern forms of delivery for products that draw heavily from traditional knowledge. The products appear to be fairly accessible in terms of cost (in comparison with western medicine) and are largely viewed as natural (herbal) rather than chemical and therefore respond to culturally oriented preferences (Wamae 2009).*

Hindle & Lansdowne (2005) developed an Indigenous Entrepreneurship Research Paradigm and believe that 'all Indigenous spiritual and cultural traditions ... can be positive entrepreneurial forces.' The emerging sub-field of Indigenous entrepreneurship research offers to provide better evidence, greater understanding and greater hope of addressing the distinct and chronic problems of Indigenous disadvantage which have proved insoluble for centuries. Hindle & Moroz (2009) maintain that entrepreneurship research has been 'silently dominated by the world view of the prevailing Western hegemony. The diversity of insight offered by the emergence of Indigenous entrepreneurship as a defined and focused discipline will expand the horizons and relevance of entrepreneurship scholarship.'

Conclusion of literature review

The Cooperative Research Centre for Remote Economic Participation (CRC-REP) is a public good research centre that delivers solutions to economic disadvantage in remote Australia. The Centre has three goals:

1. Develop new ways to build resilience and strengthen regional communities and economies across remote Australia
2. Build new enterprises and strengthen existing industries that provide jobs, livelihoods and incomes in remote areas
3. Improve the education and training pathways in remote areas so that people have better opportunities to participate in the range of economies that exist.

Referring to Baum's (2004) definition of innovation – 'something truly different in the market that makes your customers' lives better' – it becomes clear that CRC-REP will indeed need to be an innovative organisation to achieve its goals. However, there is no silver bullet to becoming an innovative organisation. This paper has highlighted some of the key factors that need to be considered in the internal environment (such as leadership, organisational culture, organisational designs, human resource

management and knowledge management) and the way it interacts with the external environment (such as open innovation strategies, partnerships and Indigenous knowledge).

Hamel (2006) categorically believes that it is management innovation, more than any other kind of innovation, which has allowed companies to cross new performance thresholds. Finding new solutions to overcoming 230 years of Indigenous disadvantage will require 'a marked departure from traditional management principles, processes, and practices ... that significantly alters the way the work of management is performed' (Hamel 2006). Undoubtedly, this will include finding new ways to combine Indigenous knowledge, innovation and creativity with Western paradigms of research.

In practice: implementing an innovation model in the CRC-REP

An innovation culture is most often seen in the corporate world where businesses survive because they are producing products and/or services that their customers want more than their current goods or services or those of their competitors. While R&D results in 'improvements' a new product or service is innovative when it is 'truly different ... and makes your customers' lives better' (Baum 2006).

The challenge that CRC-REP has set itself, 'to deliver solutions to economic disadvantage in remote Australia', is unlikely to be achieved from some 'improvements' or incremental steps. Everyone knows the challenge is complex and difficult, and that there are no easy solutions. As complexity increases, so does the need for a radically different approach. Consequently, the assertion by Hamel & Getz (2004) that companies need to 'get radical' and come up with radical ideas that 1) change customer expectations or behaviours, 2) change the basis of competitive advantage or 3) change industry economics certainly appears necessary to achieving CRC-REP's vision. It is the Board's responsibility to ensure that the organisation is both competitive in the research market (attracting research funds and projects) *and* that it delivers positive outcomes for people living in remote Australia.

What are the critical factors in creating an innovative public-good research organisation? Experience from the corporate sector shows that companies that produce innovative goods and/or services begin with a process of embedding or institutionalising innovation as a *core value* within the organisation (refer to Hamel & Getz' discussion, page 5). Organisational innovation is a continuous process that spreads through the entire organisation, but it clearly begins with the core language, thinking and actions of the Board and Executive Leadership. A review of the literature suggests that organisations have embedded innovation through a series of steps starting at the Board level; these steps may include:

Step 1: Strategic alignment where innovation is stated as a core value and focus in Vision, Mission, Strategic and Operational Plans (c.f. core outcomes focus of DKCRC).

Step 2: Establishing a subcommittee with overall responsibility for the implementation and reporting of innovation strategies across the business.

Step 3: Providing direction to management in terms of why the organisation needs to be innovative.

Step 4: Providing direction to management into the broad areas that require innovation.

The literature indicates that innovative organisations are those where innovation is everyone's business and it occurs throughout the organisation. For example, the literature suggests that innovation needs to occur in the following areas:

1. **Management innovation** – need to reinvent management to cross new performance thresholds (more bangs for your buck)
2. **Leadership innovation** – integrating top-level leadership, strategic innovation and executive cultural intelligence to magnify the positive effects of leadership
3. Administration innovation – finding new ways to implement policies and procedures (e.g. monitoring and evaluation) that do not inhibit creativity and innovation
4. **Human resource management** – to better attract and retain innovative staff
5. Research innovation – rethinking **Organisational design** to maximise creativity and idea creation
6. Innovation at the individual project level – to generate new ideas and increase **Employee motivation and job satisfaction**
7. **The researcher/supplier/consumer interface** – working with Aboriginal and Torres Strait Islander partners to assist them to identify required outcomes (as opposed to solutions). Collaborating with private businesses to commercialise intellectual property developed with Ninti One.
8. **Indigenous knowledge and entrepreneurship –** working in the 'third space' where Aboriginal and Torres Strait Islander and Western knowledges converge.

While the Board is responsible for setting the overall direction of the organisation, it is management that leads and provides the right work environment for all employees to implement the innovation strategy. Making innovation a core value requires management to identify and implement actions within key areas of the organisation. A review of the literature suggests that organisations have successfully implemented an innovation strategy at management level through a series of steps, including:

Step 1: Being strategically aligned so that innovation is embedded within the operations. Specific actions include, but are not limited to, determining key performance indicators (KPIs) that relate specifically to the innovation process (refer to **Innovation value chain** in the literature review). KPIs are then included into planning documents such as Business Plans, Action Plans, Project Plans, etc.

Step 2: Identifying the innovation champions within the organisation (refer to the discussion on **Leadership**). It is important that champions are found at all levels, including the Board, executive, administration, researchers, human resources, Aboriginal and Torres Strait Islander community members and business partners. The innovation champions meet regularly as a multi-disciplinary team to form strategies for embedding innovation deeply within all areas of the organisation. Provide **training** to the champions so that they can also be innovation mentors within the organisation.

Step 3: Implementing a reward and recognition system based on motivating factors such as recognition, responsibility and advancement (refer to discussion on **Employee motivation and job satisfaction**). The

people who create the idea and then convert it to the new product or service must be recognised and rewarded. People will not continue to innovate if they see other people (including managers) take the credit for their ideas and hard work. Management needs to identify recognition and reward systems that are valued and revered by employees.

Step 4: Using the **Innovation value chain** to determine implementation strategies for generating and creating solutions to the 'big problems'. Implement systems that address each of the six critical activities of the innovation value chain. For example:

1. Implement systems for posting problems to encourage *idea creation*. Use a combination of systems to suit the requirements of different people. For example, provide an area on the CRC-REP website where problems can be posted and people can submit ideas; use social networking technologies such as Facebook, blogs and Twitter; post problems on a whiteboard in the tea room or foyer where anyone (including visitors) can post ideas. The quality of ideas will improve the more this is used, and people will take it seriously when they see their ideas being considered, implemented and they are recognised for it. Equally important is the posting of real problems that are genuinely important and difficult to solve.
2. Implement systems to capture *idea generation*. For example, a tracking system that identifies all people involved in the process from the original idea to the final product or service. Feed in all ideas, even those not initially used as they may become useful at a later date.
3. Implement a multi-disciplinary team that *screens and selects ideas*. The team needs to include people from across the organisation, probably the innovation champions in the first instance. Ensure the system adequately prevents situations where a manager can sabotage an idea simply because he/she does not believe in it, as this will quickly kill creativity and idea generation within the organisation. From all the ideas, develop a list of the most promising. From this list, approach the idea creator/s and select an innovation mentor to work up the idea against set criteria (use a similar system to a weighted tender process). The team then ranks the ideas and forms a short-list of idea/s to be further developed. Ensuring this process is open and transparent and that people get feedback will help to improve the quality of ideas as people will gain experience in what the organisation is looking for.
4. Invite people to form a multidisciplinary team to *develop ideas*. The idea creator should be part of this team, regardless of their position within the organisation. The team needs to identify the team champion who will report on their behalf to senior management and/or the Board. The team champion should be someone who has heightened cultural intelligence (refer to discussion in **Leadership**) because they are 'likely to motivate, inspire and direct followers more effectively, overcome intra-organisational obstacles, and promote organisational innovation'. Having the right person in place is important to ensure dissemination across the organisation.

The above model is suited to solving the big, complex challenges of delivering 'solutions to economic disadvantage in remote Australia'. Running parallel with this is the need to have an **Organisational culture** where everyone personally identifies with the customer-focused nature of the challenge. Everyone needs to believe that the contribution they make, no matter how small it may seem, is valuable in creating a can-do culture that improves the way the organisation works and/or delivers a better service to customers. The literature suggests that creating the 'right' culture involves some key considerations :

Consideration 1: Allowing and encouraging people to change their work environment and recognising and rewarding people for these 'innovations'. This helps people to see that they are contributing to the overall vision of the organisation. The recognition may be in the form of a Wall of Honour where small changes that have made a positive impact can be recorded and people recognised, or a monthly celebration where people are invited to share the small changes they have made and the chance to win the 'trophy' that is awarded to the 'best' monthly innovation. The culture then becomes one of everyone thinking all the time about how they can improve the work they do and knowing that they have the capacity to implement the changes. It also instils a continual improvement mindset that is truly ongoing, rather than an 'innovation day' when people come together and create a lot of ideas and then don't think about them again for another 12 months.

Consideration 2: Closely related to organisational culture is **Organisational design**. This needs to be seriously considered, as bureaucracies generally result in putting an upper limit on what employees are allowed to do. Having an organisational design that allows staff greater decision-making over their own work creates an environment that encourages employees to make changes that will result in the overall achievement of the vision. Employees are usually the best placed to find ways of doing their jobs more effectively but when the organisation standardises the way things are done these ideas do not surface. The literature suggests that it is possible to balance the need for innovative changes with the need for standardisation by allowing employees a certain time allocation each week to work on finding creative solutions, as well as the opportunity to discuss their ideas with an innovation mentor (rather than their direct line manager). So that this does not become an unproductive exercise, it may be prudent to implement a system where staff apply for 'innovation leave' to work on innovations in their job area (similar system to applying for study leave where most Government agencies allow up to 5 hours/week each semester). Applications are for a set time period (say 10 weeks) in which time the progress is reviewed by the employee and the innovation mentor and line manager. This will ensure that there is a productive use of 'innovation leave' because failure to make changes will jeopardise future applications.

Consideration 3: The corporate world is solving complex problems through **Open innovation and open technology**, which allows for accessing and exploiting knowledge from outside the company. While in some ways the CRC model already utilises an open innovation model in that many organisations are involved in 'solving problems', in other ways it remains a closed system with only people from the partner organisations contributing to ideas. Research shows that solutions can come from unlikely places and hence the problem should be broadcast to people in varied fields. Lakhani & Jeppesen (2007) found that in 30% of cases, problems that could not be solved by experienced corporate research staff were cracked by non-employees. Open innovation in no way diminishes the role of internal staff, as they remain important for determining which problems should be broadcast, which potential solutions are best, as well as helping to implement the solutions.

In conclusion, fully engaging the talents of every individual will undoubtedly deliver solutions to the major challenges such as economic disadvantage in remote Australia.

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