

Review of the National Innovation System - Submission  
Secretariat to the Expert Panel,  
Review of the National Innovation System,  
Department of Innovation, Industry, Science and Research,  
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**Type of Organisation** (e.g. industry, government, not for profit, research provider)

Outlook Management is a sole practice consultant on

- strategies for development of industry competitiveness and regional economies, including cluster development;
- industry, economic and transport studies including indicators of performance and cost-benefit analysis;
- research in transaction costs and the governance of competitiveness, and
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**Declaration of Interest:** I have been an observer and participant in cluster development in South Australia and around the world since 1997. I am presently investigating on my own account the potential impacts of regional culture on the performance of regional enterprises with a view to future commercial consulting opportunities.

### **Submission.**

Innovation is the process of implementing change, new things or new processes responding to new needs of end users. Innovation adapts natural endowments or built strengths to the (rapidly changing) needs of end-users.

Innovation is vital to life and economic development because it enables life and enterprise to adapt to external threat and opportunity.

Invention is the origination and of an idea, thing or process. It is important but it is not necessary or sufficient for innovation.

While invention requires that the feasibility of the idea is demonstrated, innovation requires that the idea is adopted and implemented, bringing about change in our lives. Invention can be a solo activity but innovation is always a social process because implementation of change always involves others.

### *The Challenges facing Innovation*

A key challenge for government, business and community is to make innovation happen more often.

### Risk

However innovation is risky. Efforts to produce innovation are prone to failure. While successful innovation can produce significant benefits for the society and it can produce unanticipated disruption and social crises.

For example, the current global credit crisis is in part a result of financial innovations which have also produced benefits in capital markets. The huge productivity gains in industry which resulted from successive innovations also produced crises as activity shifted first from high cost one-off craft production to low cost, high volume standardised mass production, and then to low cost, high volume, high variety lean production.

“Lean production ...uses less of everything compared with mass production – half the human effort in the factory, half the manufacturing space, half the investment in tools, half the engineering hours to develop a new product in half the time...half the need inventory on site, ...fewer defects, and a greater and ever growing variety of products.” (Womack, Jones & Roos, *The Machine That Changed the World*, Macmillan, 1990, p.13)

All these innovations responded to the needs of end users of their time for credit, for custom made transport, for low cost transport and for transport better adapted to individual need. All created benefits, social change and potential or real crisis.

This capacity for innovation to produce crisis is a basis of community resistance to innovation which leads to regulation and consequent restriction of further innovation. The unfortunate response to crisis is the creation of short-sighted regulation and cultural constraints which limit further innovation.

The Commission might respond with a more positive proposal that innovators consider ways to protect the innocent and help the injured, when developing their prototypes.

### Areas of Advantage

Variations between regions and nations in the mix of industry clusters present in the economy are an under-used source of comparative advantage and innovation.

For example, innovations in micro-innovation in Australia occurred in South Australia where clusters from the motor industry, defence industry and horticulture industry co-existed. Some early advances in micro-irrigation emerged in the Riverland by combining precision injection moulding from the motor industry, sensor technology from the defence industry and studies of the varying capacity of soils to hold water from the irrigated horticulture.

Synergies between clusters of industry produce points of difference and distinctive advantages for innovation. The Commission might recommend efforts to re-energise cluster development and linkages between clusters.

### Existing Social Networks in the Community

It is widely and wrongly believed that established and collaborative networks favour innovation. The negative influence of existing social and cultural networks on innovation is well known and widely reported in the literature. The following incomplete comments illustrate this.

Sethi, Smith and Park report that social cohesion and allegiances are examples of specific assets which can be lost if a group participates in innovation and changes the way things are done. Innovation is favoured by low levels of social cohesion and allegiance, by encouragement to experimentation and risk taking, and by close monitoring and demonstration of the importance of the project. Too much diversity on a team inhibits sharing of insights and too much social cohesiveness on a team suppresses sharing of ideas. Managers are advised to encourage teams to be venturesome, to experiment, and to take risks and to monitor closely the progress of their teams. This overcomes a preference to stick with familiar and routine problem-solving approaches rather than pursue untried ideas. Team members may see their familiar routines and their networks as part of their specific asset set and resist changes which may devalue these assets.

“...merely including people from a large number of functional areas on a team doesn't improve its innovativeness...While more ideas may come to the table as diversity increases, team problem solving gets harder....team members often hold deep-rooted functional allegiances that can compromise their ability to identify with a new team. ... Candid debate is critical to the process of innovation. Yet high social cohesion among team members can actually suppress the forthright exchange of opinions. Highly cohesive groups focus more on maintaining relationships and, thus, tend to seek concurrence...as social ties among members of a cross-functional team intensify, the innovativeness of its new product diminishes.” (Rajesh Sethi, Daniel C. Smith, and C. Whan Park, (2002), “How to Kill a Team's Creativity” Harvard Business Review, 80, 8: 16-17.)

Florida, Cushing and Gates report that while communities with strong social networks bound by shared norms, trust and reciprocity may enjoy enhanced cooperation and productivity, they do not enjoy high rates of innovation.

“Studies of...hundreds of metropolitan areas...comparing levels of social capital and levels of innovation (as measured by technological intensity and

number of patents filed) ...found that areas with low levels of innovation scored high on social capital [and that...areas that did well on innovation ...tended to have below-average levels of social capital...Relationships can get so strong that the community becomes complacent and insulated from outside information and challenges. Strong ties can also promote the sort of conformity that undermines innovation. Weak ties, on the other hand, allow a basic level of information sharing and collaboration while permitting newcomers with different ideas to be accepted quickly into the social network.” (Richard Florida, Robert Cushing, and Gary Gates, “When Social Capital Stifles Innovation” HBR, 80, 8: 20)

### *Issues for the Review*

Accelerating innovation in Australia requires better governance of innovation processes, to manage risk, and better community awareness of innovation and change management processes, to manage expectations.

Governance must be matched to each of the stages of innovation: gathering and sharing of ideas, defining and testing prototypes, and mainstreaming. The governance of idea sharing is best structured as a market of peers which includes people who are unfamiliar with each other. The definition and testing of prototypes is best governed within a contract or hybrid structure, preferably reporting to the group of peers. The mainstreaming of innovation will usually involve a hierarchy.

These governance structures allow the participants to adapt to threats as they emerge.

The commission might consider proposing a best practice model of innovation which would include the governance processes for each stage.

### Managing Community Culture

This commission should be aware that the culture of the community influences the rate of innovation. The culture of the community influences the culture of the workforce and the culture of business. Efforts to stimulate innovation which do not address community culture will be more costly and more likely to fail.

Operations excellence generates safety, throughput, profits, innovation and competitiveness in heavy industry allowing investment in further processing and in life extension and upgrading of facilities. Local communities and suppliers have a major stake in the safety, prosperity and pride which operations excellence delivers.

A cultural understanding of operations excellence is critical to success. Suppliers can learn from performance evaluation about the need to improve supervision, precision, cycle time and skills, and to participate in improvement projects. Communities can learn from reliability and innovation festivals, celebrations of throughput achievements and changes in the regional teaching and research agenda, so that people coming into plants better understand the processes of reliability.

Some communities have cultures and institutions which are highly resistant to change. Communities which are resistant to change can readily export this culture to the

workforce of the enterprises which they host. Many communities do not understand or value the processes of innovation or of best operating practice within the enterprises which they host. These communities may have institutions which teach entry level occupational trade skills but none which teach the elements of the best operating practices relevant to the enterprises which they host. Workplace safety and productivity both decline.

Anecdotes abound of monocultures growing up which endorse or laugh off equipment theft, poor attendance, petty vandalism and rent-seeking behaviours against enterprises among workforce and contractors alike.

The effect is to weaken the enterprises. As enterprise profitability is weakened, reinvestment in the business falls and life extending investment is not undertaken. The impacts on the sustainability of the community can be and often are catastrophic: early closure of long established plants, difficulties retaining competent managers and staff.

The future of innovation in Australia will depend upon the quality of our communities and the courage and resilience those communities offer to the enterprises which they host. These communities will need to build confidence in their capacity to manage potential crises arising from innovation.

Innovation is an outcome of an innovative culture. The commission should give attention to ways in which communities can build an innovative culture. Communities with an innovative culture will increase the life-expectancy and productivity of the infrastructure and business capital which they host and the productivity and prosperity of their community.

Education and festivals will form part of the development of an innovative culture.

Communities will need to be familiar with the processes of innovation which are relevant to their particular industries. Deming's 14 points, Shewhart's cycle (Plan, Do, Check, Act), Lean Thinking, Theory of Constraints, 6 Sigma (Define, Measure, Analyse, Improve and Control) all contain teachable content which can be incorporated in community festivals, school curriculums, conferences and celebrations of innovation.

A key aim of innovation festivals should be to familiarise communities with the practices and processes of innovation. They should not be limited to inventions and commercialisation.

In addition to these an innovation festival could include:

- Awards and demonstrations would include process improvements achieved in schools, hospitals, homes, local government, retailing, banking, mining, manufacturing, customer service and all sectors. Awards and demonstrations would also include safety and reliability improvements. Regional suppliers would be recognised through supplier evaluation and supplier of the year awards.

- Schools would display student projects solving problems and developing innovations for application in the home, at school and in regional enterprises.
- A regional operations forum would provide all the enterprises of the region an opportunity to share site visits and demonstrations of best practices.
- High level regional conferences would provide news of emerging operations technology, reliability and safety techniques hosted by universities and supported by a year round visiting specialist program.
- Regional events would celebrate improvements in the volume of regional processing and value adding.

The Commission might consider the scope for developing a template for ways to adapt community cultures and institutional structures in ways which support innovation within community enterprises.

### End-Users

In 1948 sailing ships were still visiting Port Victoria on Yorke Peninsula in South Australia to collect Barley bound for Germany. This seems remarkable. France was and is a producer of Barley. Why travel all that way in a leaky boat? At the time, it appears, drinkers of premium beers in Germany liked the flavour components in Yorke Peninsula Barley. Today Germany buys from Alberta, Canada. Why? Alberta bred strains premium buyers like to drink; Australia bred strains that will grow here.

In Australia export malting Barley grows in 350mm to 500mm rainfall zones and accounts for 75% of all Australian Barley sales. From 1962 to 2005 Australia has spent \$165 million breeding 48 varieties of Barley, most of which were for regional growing conditions. Of these 48 varieties, four varieties together account for 76% of sales and 22 varieties together account for less than 5% of sales. The industry has changed the targeting of research to better address end-user needs. (Barley Breeding Business Plan, March 15, 2005)

The commission should note instances of research and development activities which do not connect to end-users, and which produce little of value.

### *Conclusions*

The Commission might propose that innovators consider ways to protect the innocent and help the injured, when developing their prototypes.

The Commission might recommend efforts to re-energise cluster development and linkages between clusters, both to differentiate innovations and to better address unanticipated consequences.

The Commission might consider proposing a best practice model of innovation which would include the governance processes for each stage.

The Commission might consider the scope for developing a template for ways to adapt community cultures and institutional structures in ways which support innovation within community enterprises.

The commission should note instances of research and development activities which do not connect to end-users, and which produce little of value.