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**The Road to Innovation:
Experiences in the Australian Wine Industry**

David Aylward

In recent years the potential for industrial clusters to create ‘competitive advantage’ has become an issue of growing discussion. As the identifiable cluster types have proliferated, so the debate has turned to performance outcomes, local economic conditions and state intervention (Maskell & Malmberg, 1999; Lundvall and Maskell, 2000; Mytelka & Goertzen, 2003).

It is also argued that the global landscape is increasingly punctuated with regional enclaves of specialized industries and innovation built around clusters of small and medium firms in response to international pressures (Isaksen, 2001; Aylward, 2005). There exists a creative milieu of firms, industry bodies, research institutions and suppliers that drive innovation through both vertical and horizontal integration. This structural ‘thickness’ feeds directly into export activities, a phenomenon that locks such regions into global markets and priorities (Aylward, 2005).

It is the intention of this paper to gauge user perceptions within particular cluster types in the Australian wine industry. This industry is an excellent example because it represents one of Australia’s most dynamic in terms of innovation uptake and networking, as well as hosting clearly defined and naturally occurring clusters. The paper will assess and compare perceptions of innovative activity (where and how that innovation is taking place), its impact of that activity and the importance placed on that activity between different cluster types.

The central hypothesis of the paper is that geographic proximity or co-location within the wine sector is perceived by the users themselves as a central driver, and one that creates a significantly different impact for those operating within and outside developed clusters.

Michael Porter (1999) has described clusters as:

“A form of network that occurs within a geographic location, in which the proximity of firms and institutions ensures certain forms of commonality and increases the frequency and impact of interactions”.

It is this network between public and private sector ‘actors’ that can be so effective in generating an environment of concentrated innovation. As the environment becomes more interactive, more actors tend to be attracted from a range of related industry sectors. This results in the growth of value-adding, as both competition and cooperation within the cluster are further elevated. Mytelka points out that this intense interaction within clusters becomes itself a measure of innovation. Firms learn their innovative behaviour from their environment. The more intense and robust the cluster, the more innovative the firm (Mytelka & Goertzen, 2003).

Wine Industry Clusters

While wine is one of the world’s oldest commodities, the systemic organization, infrastructure, packaging and marketing of this commodity is more recent. It has been referred to as an ‘industry’ only within the past 25 years. Now, however, particularly with the emergence of high-growth New World wine industries, the sector is attracting intense interest. Importantly, New World wine industries are also attracting interest because of their natural tendency towards cluster formations, or what Porter refers to as ‘pre-existing local circumstances’ (Porter, 1998).

The desire to export has been a key factor in the evolution of wine clusters. While, historically, wine firms have always emerged in proximity to existing and new grape-growing regions, it was the desire to export, to expand markets that triggered systemic organization. In catering to international markets, New World firms quickly realized that the most effective way to compete with their Old World counterparts was to produce and market a consistently high-quality product, at reasonable price points, to the world. This required a coordinated approach to research and development (R&D), a well-developed supply chain, sustainable alliances between growers and producers, significant public and private sector infrastructure and a unified marketing strategy.

Wine clusters will, however, vary in development, intensity, connectedness and therefore effectiveness. The least developed will include a loosely knit group of firms with some associated suppliers, perhaps local industry associations, some related agricultural firms, technical education providers and growers. Contrasting sharply with this model is the highly evolved, innovative cluster, which displays a significantly different business and organizational culture. There is a cohesive integration of suppliers, wine makers, growers, marketers, numerous related industries, and the national research, funding, regulatory, education and infrastructure bodies that help provide the framework within which these firms compete and cooperate so effectively (Mytelka & Goertzen, 2003).

The Australian Context

Today, the Australian wine industry is at the forefront of a changing international wine landscape. It is one of the 'upstart' New World participants that have sacrificed

tradition for innovation and growth. As a result, it has transformed itself from a cottage industry to a leading exporter, ranked 4th internationally in 2005, with sales of \$2.75 billion. The industry has approximately 1900 wineries, with 164,181 hectares under vine, and crushes 1.86 million tonnes a year (Winetitles, 2005). The growth has indeed been impressive.

Such figures, however, tend to mask the uneven distribution of resources, research infrastructure and wine production across the industry. Of those 1900 wineries, the 22 largest account for over 89% of sales. Almost 70% of wineries crush less than 100 tonnes annually. In terms of exports, the top 20 exporters account for approximately 85% (Winetitles, 2005). These patterns of activity are not only restricted to size. Clusters play a critical role, as does the difference *between* these clusters.

Furthermore, all national industry associations, including regulators, national supplier groups, export councils, federations and research bodies, are located in the South Australian wine cluster. Funding and intermediary agencies are also located there, as are the national training and education bodies. While South Australia is home to only 24% of the country's wineries, it accounts for close to 50% of production and 66% of the nation's exports.¹ More than this, however, the South Australian cluster epitomizes the innovative model. While wine clusters in New South Wales, Victoria and Western Australia represent Mytelka's less developed 'organised' model, South Australia has successfully integrated the core ingredients of viticultural and wine innovation, as well as the organizational and marketing requirements into a highly evolved mix of domestic and export activity (see figures 1 & 2). This is what sets it apart. The

apparent two-way articulation between innovation and export is refined to a degree that one appears to a large extent to feed into the other (Roper & Love 2002).

Figure 1: Firm Connections within the 'Innovative' South Australian Wine Cluster

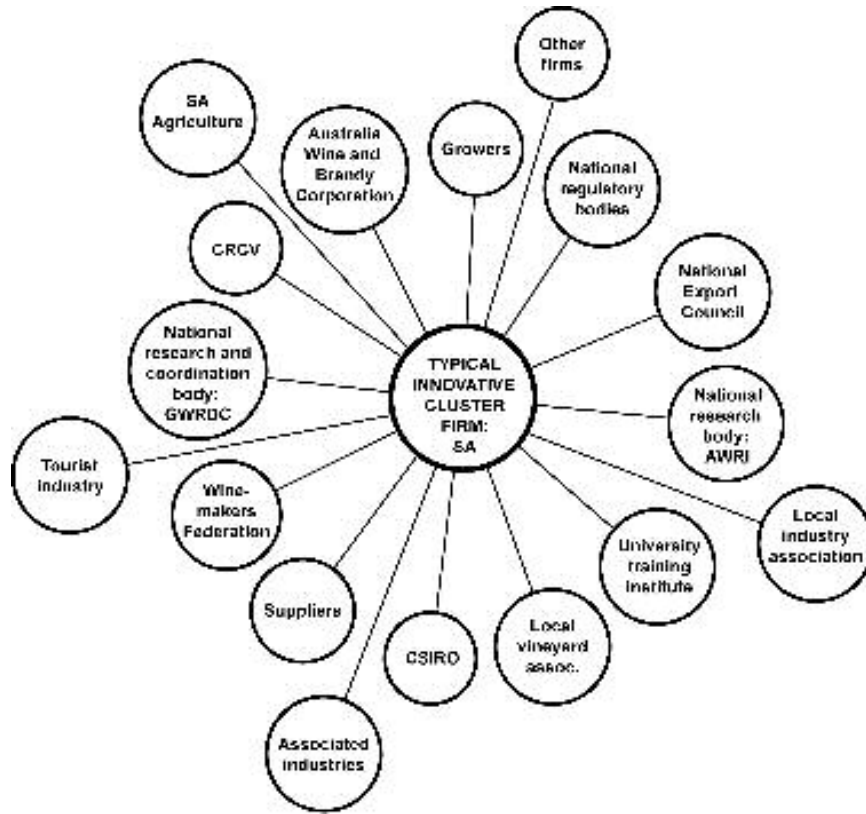
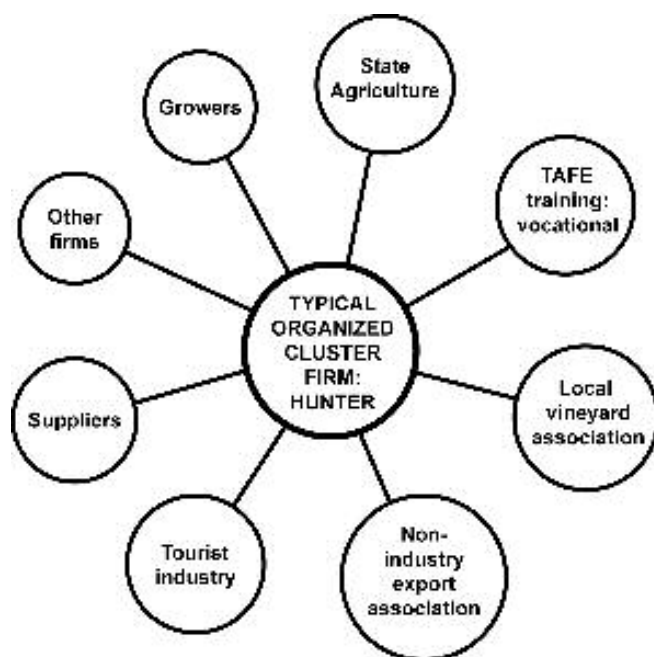


Figure 2: Firm Connection within a Less Developed 'Organised Wine Cluster model



Method

This study, carried out in 2005, focused on the perceptions and experiences of 165 micro and SME wine firms (using phone and email surveys) across four Australian states. The sample was divided equally between South Australia, New South Wales, Victoria and Western.

The sample was based on a stratified, randomised selection of firms within defined regions in the four states. In South Australia, the regions included the Barossa Valley, Adelaide Hills, Clare Valley, McLaren Vale and Coonawarra. In New South Wales the regions included the Hunter Valley, the Central West region and the Southern NSW region. In Victoria they were the Yarra Valley, Mornington Peninsula, the Pyrenees and Rutherglen. In Western Australia the regions included the Swan Valley, Great Southern, Margaret River and Perth Hills.

Findings

Innovation Leadership

For more than a decade the Australian wine industry has enjoyed a reputation of innovation leadership within the sector. There is a strong centralization of levy collection, resource distribution and research prioritizing. This has helped ensure that the dissemination and uptake of innovation within the industry are maximised and the roles of the respective organizations clearly defined. The outcomes of course, have resulted in a template of high-quality, consistent and well-marketed product against which the rest of the wine world benchmarks.

This leadership issue was raised among 165 respondents of the study. Almost 82% agreed that the Australian wine industry enjoyed a leadership position, with 28% stating it was substantial and almost 54% stating it was moderate. Another 15.6% thought Australia's innovative capacity was comparable to other major wine industries while only 2.5% thought it was lagging. The types of innovation in which Australia's leadership was considered strongest included:

- New product development
- Product differentiation
- Employee training
- Distribution networks
- Marketing

In terms of the perceived drivers of the innovation the majority (61.6%) of respondents believed firms were as effective as industry bodies such as the Grape and Wine R&D Corporation, the Cooperative Research Centre for Viticulture, the Wine Research Institute and the Winemakers Federation of Australia in generating innovative activity and creating a research culture within the industry. Firm respondents accepted that industry organizations drove the R&D priority setting and extension, but believed firms' innovative behaviour and readiness to adopt new techniques nurtured the industry's creative milieu. As shown in table 1, when these responses were analysed by cluster type, the pattern remained similar, although Victoria and Western Australia were slightly less positive about industry contribution.

Table 1:

Industry bodies as:	New South Wales	South Australia	Victoria	Western Australia
Main drivers	31.7%	28.6%	21.6%	24.3%
Joint with firms	60.9%	65.3%	62.1%	56.7%
Minimal input	7.3%	6.1%	13.5%	13.5%
No input	0%	0%	2.7%	5.4%

Innovation intensity

The perceived geographic pattern of innovative activity, however, provided dramatic, if expected results. The results also reflect findings from the author's previous studies, as well as other innovation cluster studies (Aylward, 2004; Mytelka & Farinelli, 2000; Roper & Love, 2002; Rosenberg, 2005). When respondents were asked where they thought innovative activity was most concentrated within the industry over 88% nominated the South Australian cluster. The perception aligns closely with previous data collected by the author (2004) showing that 68% of firms within the South Australian cluster used the industry's research services on a regular basis, compared to only 32% within the Victorian and New South Wales clusters.

Other data from the study also highlighted the difference between clusters with regard to a number of core indicators of innovation. For example, in terms of firm collaboration for research, marketing and other 'innovative activities', 64% of South Australian firms claimed they had been involved in this type of collaboration within the past three years, compared to 44% from the other state clusters. For other indicators such as new product development, improvement to production processes, education levels of employees, training levels, technical innovation and branding the South Australian firms recorded higher rankings in each case. Although the lead was variable, there was a clear pattern of innovation leadership within this cluster.

Interviews conducted with industry representatives from the major research-oriented organizations confirmed that South Australian firms were more likely to access and utilize the industry's R&D pools. Perhaps Boschma (2004) explains the reasons for this most succinctly when explaining the benefits of proximity:

“...proximity is regarded as essential, because it tends to lower transaction costs, it facilitates the transfer of (tacit) knowledge and thus, learning and innovation, and it encourages co-operation between firms...”.

It is the intensity of this proximity – geographical, organizational and cognitive, that has created an almost ideal ‘ecosystem’. In the case of South Australia, the pronounced vertical and horizontal integration, the structural ‘thickness’ and the fact that the cluster is locked into global priorities, have created an innovative climate that acts as an incubator for those firms within the cluster, but is increasingly perceived as excluding those on its periphery.

The perception of exclusiveness was clearly an issue among respondents. Relating to the perception by 88% of respondents that R&D was concentrated within the South Australian cluster, firms were next questioned about how this concentration impacted on their own ability to participate in the industry’s research initiatives. 82.1% of South Australian firms believed that the concentration of innovation in their state was beneficial to their own firm while an average of only 41% from the other clusters shared this belief. Additionally, only 4.4% of South Australian firms believed it was a disadvantage as opposed to 20.5% (average) from the other state clusters. The remainder had mixed perceptions on the impact.

When asked how this same concentration impacted on the industry as a whole, rather than individual firms, perceptions were generally more positive. Still, South Australian firms were more positive than other respondents, with 91% claiming the concentration of R&D resources was beneficial. The average for the other three clusters was 74%. Similarly, those South Australians who thought it was a

disadvantage only represented 4.5% of firms while the average for the other clusters was 12.1% (see table 2).

Table 2: Perceived impact on Industry of South Australia's intense cluster (N=160)

Impact	NSW	SA	VIC	WA	Average all
Highly Beneficial	19.5	22.7	15.8	2.7	15.6
Beneficial	58.5	68.2	50..	75.6	63.1
No Impact	12.2	4.5	18.4	10.8	11.25
Disadvantage	9.8	4.5	15.8	10.8	10

Although very few within the industry talk in terms of clusters, in Australia the wine industry's organizational structure and necessarily intense pockets of co-location represent the natural, resource-driven cluster model perhaps more than any other industry sector. Firms recognize that being located within these clusters allows them advantages not enjoyed by those firms residing outside the cluster. Similarly, members of more intense, innovative clusters enjoyed greater advantages than those within less developed clusters.

This theory may be retained for the issue of 'awareness versus use' of industry R&D. There was very little variation among respondents between cluster types when asked about their awareness of the industry's R&D initiatives and outcomes. Approximately 85%-90%, regardless of cluster type, claimed that their awareness levels were 'above average' to 'high'. The primary factor in this uniformity, is the industry's excellent system of information dissemination (Smart, 2005). Modern cluster literature places significant emphasis on the relevance and availability of information and the Australian wine industry has established itself as a benchmark for timely, dedicated and relevant information for the use of its participants. There are at least five industry wide journals/magazines that address issues from viticulture to wine-making to business development, to export to R&D and the uptake of this media is widespread

among users. In addition, there are numerous industry websites, newsletters and conferences dealing with a broad range of industry issues.

There is, however, a gap between awareness of the industry's research and participant use of that research. Even though still high compared to other industry sectors, the cluster distinction remains. Approximately 88% of South Australian respondents claimed that they were regular users of the industry's R&D compared to an average 68% from other clusters, a pattern which closely reflects data from the author's previous study (2004). The pattern may be extended to firm collaboration and networking, another common element in cluster theory (Porter, 1998; 2004) where the level was high for both cluster types but higher still for South Australia (76%).

Competitive Advantage

Perhaps the most telling section of the survey was that in which respondents ranked core indicators of innovation for their firm's *actual* competitive advantage, as opposed to mere perceptions. Cumulative scores were generated for each of the indicators, which included: uptake of technology, new product development, product differentiation, branding, marketing, distribution and exporting.

Table 3: Innovation performance by state cluster

Indicator	NSW	SA	VIC	WA	SA % lead
Innovation uptake	134	162	118	126	28.5%
Marketing	148	195	162	136	30.9%
Market placement	154	192	161	140	27.2%
Prod. Differentiation	163	193	153	149	24.5%
New Prod. Development	140	145	120	124	13.3%
Employee training	125	157	113	119	31.9%
Process improvement	151	164	122	127	23.3%
Distribution channels	132	186	139	150	32.9%
Agents	94	150	99	120	44.2%
Exporting	121	158	113	129	30.6%

As the table shows, South Australia leads in all indicators. The fact that these *actual* measures of innovative orientation run parallel with *perceptions* of that innovation tend to reinforce the patterns of activity within different cluster models.

Conclusion

In terms of industry R&D support and coordination the Australian wine industry has provided a much envied template. It could be safely argued that the R&D vision, approach, support, coordination and infrastructure have been critical factors in the rapid transition of the sector from ‘cottage industry’ status to that of a global success story. The nationally coordinated approach has secured the industry’s R&D capability, its distribution channels and as a result, the most popular price points in the world’s largest wine markets.

It is an approach that has also created a number of industry clusters. These clusters have established international benchmarks in the uptake of oenological and viticultural innovation, as well as providing leading-edge practice in all forms of vertical and horizontal integration among SMEs. As this paper has highlighted, however, there is significant difference between these wine industry clusters. It is a difference that has changed the national landscape and led to a mismatch in resources, productivity and competitiveness. It is also a difference that now needs to be managed carefully by the industry to ensure that intense innovation in some regions does not lead to inertia in others. Effective, regional-specific extension programs, together with a re-alignment of national, regional and firm requirements is essential in driving the industry through the next phase of its development.

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