Cluster Initiatives in Australia's Tooling Industry

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Abstract

Clustering as a form of collaboration has received increased attention in the past decade in academic and business circles. An increasing number of academic disciplines have offered their perspective on clustering and it has also featured more in policy discussion. This paper offers an initial analysis of interview-based cluster research seeking to identify the key drivers and barriers to clustering in Australian manufacturing, in particular in the tooling industry. An outline of the definitions for "cluster" and "network" used in this research is provided along with an overview of the related cluster and collaborations literature. An outline of the industry-based RELINK project from which this research was generated is also provided. Finally an initial thematic analysis from the research is presented with some interesting results being uncovered, in particular, the impact of China and its low cost manufacturing exports was highlighted. Overall, clustering was seen as a concept with a number of advantages, but not necessarily sufficient advantages to overcome the causes of the industry's widely accepted decline.

Keywords: Clusters, Collaboration, Networks, Manufacturing,

1. Introduction

Clustering has been a policy consideration of governments in Australia since the early 1980's, however it was not until the 1990's that it was directly suggested as a way of increasing the nations competitiveness. A 1994 report by McKinsey and Company was the first to specifically mention clusters as an industry policy. However a change in power of the federal government in 1996 saw the abandonment of a number of the cluster programs. In more recent times there has been an increased interest in the role of clusters at all levels of government throughout Australia with a majority of the interest being evident from the South Australian and Queensland governments (Enright and Roberts, 2001). To date, Australia has some early and growing experience with clusters, most of which are primarily regionally driven. According to Enright and Roberts (2001) "the challenge facing Australia is how to apply the lessons learned from this brief exploration of industry clustering in setting future strategic directions and initiatives that will strengthen the capacity of firms and industries in regions to develop and compete for new business, trade, investment and employment opportunities" (p.82).

This paper describes the initial thematic analysis of interviews with cluster participants undertaken as part of the RELINK project. Details of the research project are provided against a background of cluster literature. An outline of the research conducted to date is provided in terms of the methodology undertaken and some broad themes that have been identified from this analysis.

2. Theoretical background

Over recent years the focus on clustering has increased across areas of business and academia alike, with many disciplines taking an interest in the concept. Much conjecture exists in the literature as to what exactly a cluster is, with many and varied definitions offered by different authors from several different academic fields and authors. Along with these definitional discussions, a host of related issues are addressed as clusters are developed and maintained, with each cluster opportunity presenting its own challenges and rewards. The following section reviews the existing literature on clusters by identifying

the most appropriate definition of clusters and looking further at some of the literature covering these related issues.

2.1 Definitions

As mentioned there are many academic disciplines that have entered into to discussions on clusters, ranging from Computing with Virtual Enterprises and Virtual Organisations (Camarinha-Matos & Afsarmanesh 2004) through supply chain management to Enterprise Networks as discussed by the authors in the GLOBEMEN project (Zwegers et al 2003, Ollus 2003). Much of the work on clusters also derives from the writings of Michael Porter in his 1990 work on competitive advantage (Porter, 1990). In his more recent writings Porter has made a distinction between a cluster and a cluster initiative, with this distinction reported by Solvell et al as "clusters consist of co-located and linked industries, governments, academia, finance and institutions for collaboration", whereas cluster initiatives are "organised efforts to increase the growth and competitiveness of clusters within a region, involving cluster firms, government and / or research community" (Solvell et al 2003, p.15-18).

For the purposes of this paper two definitions will be used in relation to these collaborative arrangements, the first term is "network", and the second is "cluster". By the definitions adopted for this work, clusters form within networks. The definition of a network is based on the Camarinha-Matos and Afsarmanesh (2004) definition of Virtual Organisations but is reworded and renamed to avoid confusion which may occur through this same term being used in the computer industry to describe a different phenomenon. Thus, for the work discussed in this paper, a network is a *group of independent organisations/institutions that agree to form an alliance for the purpose of sharing resources/skills and core competencies in order to advance mutually beneficial situations.* Notice that the requirement of close geographical proximity is removed with this definition. This increases the scope of a network to take advantage of improved information and communication technologies which overcome the restrictions of geography. This is important for a market such as Australia which is isolated internationally and has large distances between major markets which are centred on capital cities.

Within these networks, member firms may join together to meet specific profit and non profit goals, these smaller groups are referred to as a clusters. Hence, the definition adopted herein for a "cluster" is a *group of firms within a network which combine their efforts to take advantage of identified business opportunities and/or repel threats*. This relationship between networks and clusters is also adopted from (Genoff and Sheather, 2003), although their definitions are slightly different due to a regional perspective in their work.

2.2 Related Cluster literature

The concept of clustering and collaboration is not in itself new, what is new are the driving forces behind the need to form into a network and the tools which are available to facilitate the process (Thoben and Jagdev, 2001). Some of the driving forces identified by the literature include increased global competition (Braun et al., 2005, Bremer et al., 2000) and OEMs (Original Equipment Manufacturers) desire for a reduced supplier base (Tuten and Urban, 2001, Oxnard, 2004). Whilst offering a number of benefits there are a number of reasons why firms appear to be reluctant to participate in such arrangements, with the main reason being a lack of trust amongst companies and individuals (Rowe et al., 2005). Thus the establishment of a cluster can bring with it many unique decisions and experiences for firm managers, such as how many firms to involve, what role(s) a facilitator should play and who should it be, through to common standards for the cluster group (Bremer et al., 2000, Solvell et al., 2003 & Camarinha-Matos, 2001).

One of the drivers behind collaboration is increased global competition which has resulted in many smaller firms having to develop new competitive advantages to compete against larger firms. In order to stay in business many of these smaller firms are forming networks in order to improve competitiveness and exercise the capability of a larger organisation while still retaining the flexibility benefits of being small. Braun et al. (2005) acknowledge this drive by identifying that SMEs (Small and Medium Enterprises) are limited in their access to specialised knowledge due to size, but can access this knowledge

collectively through clustering. Increased global competition was a major driving factor behind the establishment of the Brazilian Cluster VIRTEC. The SMEs of this collaboration were posed with the problem of being able to be noticed on the global stage, yet not exposing themselves to the associated risks and potential shortfall in resources (Bremer et al., 2000).

Another driver of network formation is the fact that "many industrial buyers are consciously making an effort to reduce their supplier base and develop closer ties with their remaining suppliers. Closer supplier ties can lead to improved performance, reduced purchasing costs, and increased technical cooperation" (Tuten and Urban, 2001). For example, Toyota has recently undergone a change to its service parts sector which has centralised some operations in Japan. Sourcing of these parts previously involved over 600 suppliers which provided significant logistical difficulties (Oxnard, 2004). OEMs are reducing the number of suppliers to form an increased focus on supply chain management (SCM) which is outlined by Trott (2002) as a system of managing across company boundaries which drives the entire supply chain towards increased end user satisfaction. In conjunction with this reduction of the number of suppliers, OEM's are also becoming more interested in assisting SME's improving their quality and efficiency. This increased interest in the remaining suppliers is in recognition of the fact that improved SME performance will have positive effects for the OEM output. Such an interest in the supply chain is obviously easier with a reduced number of supply points.

One of the difficulties experienced when attempting to establish a cluster is overcoming the fear that a SMEs competitive position in the market is not going to be compromised by collaborating with potential competitors. This factor is highlighted by Rowe et al who identified that "firms are often reluctant to share information and knowledge formally for fear of their competitive position being undermined" (Rowe et al, 2005, p.4). If firms are unwilling or unable to overcome these difficulties cluster success will be difficult to achieve as issues such as trust remain unresolved. Styles and Goldsworthy (2002) provide example of a cluster forming in the Gippsland region in Victoria. Much of the local industry was

based around the existence of the energy industry and privatisations in 1989 saw a 57% drop in the levels of employment in the energy industry in the area. In 1993 the Latrobe Regional Commission looked at ways of preserving many of the skills and industry which had developed over many years and one of the responses was to establish Gippsland International (GI). GI's main role was "to promote the Gippsland Region as a centre of engineering excellence both locally and internationally" (p.84). Without the deregulation of the industry and the loss of jobs and potential loss of industry the collaboration may not have been established.

One area that is frequently identified as a barrier to successful collaboration is that of trust (or, rather, the lack of trust). Trust occurs between firms and between individuals and needs to be actively promoted and managed within the collaboration. For this research the developmental phases of trust which are followed is that of Thoben and Jagdev (2001) who suggest that trust develops and passes through three stages:

1. ***Goodwill trust****, by which a partner is trusted to take decisions without unfairly exploiting the other partner.*
2. ***Contractual trust*** *is the keeping of promises, such as delivering goods or making payments on time, or maintaining the confidentiality.*
3. ***Competence trust*** *depends upon the technical and managerial competence of the company to perform a function, such as to deliver components within specifications.*

(Thoben and Jagdev, 2001)**.**

For trust to develop through these stages it requires both time and interaction between collaborating parties in order to progress towards this competence based trust. Goodwill trust is usual developed first and begins as soon as firms enter into a network enterprise. This involves a general understanding of what the different firms will offer to the members of the virtual organisation. Once these arrangements are deemed to be satisfactory over a period of time firms may move into contractual trust in which longer

term contracts are made. Finally after a further period of time the supplying component of the network is trusted to input directly into the other firms supply chain without inspection. Some authors suggest that the best way to overcome trust issues is to ensure that the collaboration comprises of firms which do not compete with each other for business in similar markets (Assimakopoulos and Macdonald 2002; Solvell et al 2003).

Amongst all of the discussion on collaboration, Vakola and Wilson (2004) remind us that there is also a human component which plays an important role in the development of both networks and clusters. It is people within these firms who will need to accept, support and operate the systems. The authors suggest that there are four areas which can be addressed to increase the acceptance of these collaborations. The first area is information sharing which involves outlining reasons for the change and linking the changes to rewards and allowing the new vision to be shared with workers. Organisational culture is the second area to be addressed and looks at developing high levels of motivation and job satisfaction aimed at increasing support for collaborative structures. Acceptance of change is the third aspect and involves understanding peoples concerns over the change process. And finally it is important that training be provided so workers are given the opportunity to support the new structures (Vakola and Wilson, 2004).

3 The RELINK Project

This paper is based around an industry project funded which concluded at the end of April 2006. The project attempted to establish and develop two clusters in the automotive tooling sector and participate in an existing cluster in the aerospace sector. Each cluster has a different driving force, the two automotive clusters were driven by an industry association (FORMNET Cluster) and a desire to open up new markets respectively (AGILENET cluster), while the aerospace cluster (TIFA Aerospace) was driven by a major international customer (Boeing) initiated request. Relating the project back to the definitions used for this paper, Tooling Australia provides a collection of tooling companies, thus meeting the definition of a

network as described above. In turn, the firms involved in each of the three projects forming the focus of the research meet the definition for a cluster within this network.

Each of the clusters has a different driving force upon which it was established, and investigations undertaken as part of the research reported herein seek to discover the driving forces which lead the individual firms to join the clusters. Interest also lies in the differences between the clusters and whether these differences influence a firm's decision to join the cluster. It is also interesting to note that TIFA Aerospace achieved commercial success in becoming a Tier One supplier to Boeing while the other two clusters which revolved around the automotive industry did not reach any level of commercial activity. This suggests that there are a number of barriers to cluster formation or operations that have impacted on the success of these clusters.

4 Research Setting

This section outlines the research setting, research questions and methodology behind the on-going data collection and analysis activities relating to this project.

4.1 Research Questions

There is an array of existing data and research based on clusters and collaboration, much of this research provides a good base for understanding clusters, with some authors also offering models of collaboration. One of the difficulties with these models is that they offer a solution to a specific cluster problem or environment and do not necessarily offer a generic solutions or suggestions which may be applied across different scenarios. Furthermore, much of the literature is based on the European and American experiences which do not adequately take into account many of the unique experiences and environment of Australian industry. Thus by focusing on the drivers and barriers to the clusters this research aims to identify key factors which need to be addressed in establishing and developing a cluster in the Australian manufacturing sector.

The specific research questions for which this research will attempt to answer are as follows:

1. What are the key drivers for the establishment of networks and clusters within the Australian tooling industry sector?
2. What are the key factors influencing the success of established networks and clusters within the tooling manufacturing sector?
3. What are the key barriers to success for networks and clusters in this sector?

4.2 Methodology

For this research a multiple case study basis in which a retrospective investigation into the three clusters has been taken, with each of the clusters forming the basis of a case. The multiple case study approach was chosen as the aim of the research is to uncover theoretical replications relating to cluster based theories with each of the cases studies offering a different contextual background from which to investigate the research questions. Each case will be of an embedded nature as the research explores various aspects leading to success and failure of collaboration. The multiple-case methodological approach is also preferred for its increased reliability and rigor (Yin, 2003).

The data collection for this research has utilised a number of sources in line with the multiple case approach. Interviews have been conducted with the managers of some of the participating firms and an industry association project manager in semi structured interviews utilising a series of open ended questions which were used to probe the respondents regarding the multitude of collaboration based issues which surround the research questions. Semi structured interviews were chosen due to the benefits of asking in depth questions and having the ability for immediate follow up of responses. In addition to the interviews the research also offered a number of opportunities to observe the participants and their interactions. This occurred across a number of settings ranging from formal cluster meetings, through meetings and social events organised by the Industry Association (formerly TIFA, now Tooling Australia) to individual company workplaces. Due to the nature of the research and the collaborations observed, a

combination of participant and non-participant observation was employed. Participant observation occurs when the researcher is fully involved with the participants, while non participant observation occurs when the observer is separate from the activities taking place (Collis and Hussey, 2003, Zikmund, 1994).

A range of secondary sources of information have also been collated to form a sound background to the three clusters. Information has been provided from Tooling Australia in the form of minutes to meetings for both the clusters and steering committees, they have also provided promotion material for TIFA Aerospace and TAAG. Company information has also been obtained from industry based websites which outline capabilities, company websites and advertising materials.

4.3 Data Collection

Across the three clusters there are fifty one companies from three states, all within the tooling industry with various levels of participation and cross over between projects. All involved companies will be approached for a face to face interview in order to obtain in depth detail of their experience and thoughts on the cluster in which they were part, as the research is on-going, not all companies have been approached at the time of writing this paper. Based on the Australian Bureau of Statistics (ABS) definition of enterprises all respondent firms are classed as small firms with 99 or less employees (ABS 2006). To date twenty three of the interstate firms (fifteen Victorian and eight South Australian) have been contacted by mail and phone in order to arrange face to face interviews. Face-to-face interviews have been conducted with twelve of these firms, two firms have closed, one declined and the remaining firms are to be followed up for future face to face or phone interviews. The Tooling Australia representative responsible for the RELINK project was also interviewed.

Of the twelve firms that have participated in the research to date all originally expressed an interest in the TIFA Aerospace cluster with two of those firms being Tier One or prime firms. One of these prime firms also expressed an interest in the FORMNET cluster. Of the remaining ten interviewed firms' one of the Victorian firms participated in the TIFA Aerospace cluster by sub contracting to the tier one firms, while

one of the South Australian Firms expressed an interest in the AGILENET cluster. The remaining eight firms (three South Australian and Five Victorian) did not play any role beyond expressing an interest in the idea of clustering.

For the interviews the request was made to speak with the owner or the person most involved in the relevant cluster. In all but two cases this person was one in the same, the two exceptions are the two Tier One companies who had managers responsible for the cluster involvement as opposed to the owners. The request was made for a forty five minute semi structured interview with this individual and in all cases only one interview was requested. As the interviewer, the first author based each interview on a series of prepared interview questions which were complemented by a series of situational questions based upon the respondent's responses.

The information which is presented in this paper is based on an initial analysis of the thirteen face to face interviews already conducted. All interviews were conducted by the first author at the company premises of each of the respondents.

5 Thematic Analysis

All interviews completed to date have been reviewed along with the summary notes and impressions recorded by the interviewer in order to identify some of the broad areas which have been discussed by the respondents. Areas of discussion which were repeatedly mentioned by respondents have been summarised and include:

1. The impact of China on local manufacturing
2. Viable exit strategies from a declining industry
3. Marketing advantages of cluster arrangements
4. Collaboration at different levels of the supply chain; and

5. Issues of a family business.

Of these areas of interest, marketing advantages, collaboration at different levels of a supply chain and more recently the impact of globalisation on SME's (issues 1, 3 and 4 above) have been covered in the collaboration literature to differing extents. While discussions of exit strategy and the impact of a family business are cluster related issues that were uncovered through the interview process but have not been discussed to any great extent in the existing cluster literature.

In order to maintain anonymity in the following discussion regarding these key themes drawn from the interview data each company has been given a code. Each firm is firstly identified by a letter which represents the different state from which the company is based. The number attached to the company identifier is randomly allocated to the firm and does not serve any purpose other than to distinguish one firm from another.

5.1 The impact of China

As previously outlined in the literature overview many firms are seeking to collaborate to overcome the effects of globalisation. Through the interviews conducted many of the automotive tooling firms identified that the tooling industry in Australia is in decline and many of them specifically cited the inability to compete with China on price as one of the greatest difficulties they currently face. One of the more pointed comments comes from the respondent from firm C6 who states "We have a complete disaster in the tooling industries…. the tooling industry is finished, China has really killed us with free trade. The Chinese are so cheap that all my customers go to China and bring the tools back (to Australia)". C6 goes on to identify one of the key reasons for the price advantage of the Chinese market, "I pay my guys $25 per hour. I was in China four years ago and a toolmaker was getting $1.50…. the only thing he pays the same as me is the machines". A secondary problem following on from this as identified by C6 is

that now if you are given the opportunity to quote on Australian jobs then the OEM want the work done at the Chinese price. With the quoted difference in labour costs it is easy to see why this is a difficult task.

Other respondents had similar claims with one of the most startling claims being that a toolmaker was unsuccessful at quoting and automotive job as a Chinese based company had quoted a price which was lower than the tooling firm was able to purchase the raw materials for. This concept of China having a major impact across the board in the tooling industry in Australia is again reinforced by the respondent from A12 who states that "…..the reason a lot of the tooling is going offshore is because of the low cost in China". This is an aspect that A12 itself has not been able to avoid as indicated by the A12 respondents statement that they "have been forced out of injection moulds because of China", with injection moulding having formed a core of the business for many years. Further outlining the threat of Chinese tooling firms came from C6 claim that within 5 years Chinese manufacturers will be able to land a fully operational vehicle in Australia for less then $12,000 AUD.

As China takes a bigger role in the manufacture of automotive components Australian firms are increasingly finding it difficult to compete as independent companies. In order for the Australian tooling industry to survive firms will need to look to the benefits of clustering as a means of survival. This is a point that has been clearly identified by Tooling Australia, and that now sees this Industry Association actively promoting the idea of collaboration to members. This drive for collaboration has seen Tooling Australia establish a generic industry brand, TAAG, for the use of their members. This is discussed in section 5.3 in more detail.

5.2 Exit Strategy

Another difficulty that many of these firms now face is that they are in a declining sector which has formed the basis of their business for many years. All firms interviewed acknowledged this declining industry, however the method of dealing with this decline varied across the firms and also across states.

A number of the firms indicated that they were either scaling back the amount of tooling work they were doing and they were looking to sectors other than automotive. In deed firm C9 indicated that they hoped the RELINK project would "……get us (the company) involved with areas outside of automotive". The respondent for firm C9 further identified this need by highlighting the fact that turnover for the firm had reduced from $6 million per annum to $4.5 million with the decline entirely blamed on the down turn in the automotive sector. The difficulty that such a move presents these companies is that a significant capital input is required to change the focus of the business, while the guarantee of work does not. In the case of the aerospace cluster many of the tooling firms were eager to participate in this cluster as they saw it as an opportunity to gain experience in a different industry sector which may lead to further aerospace work in the future which could supplement or even replace the declining automotive work. The route taken by another of the interviewed firms was to remaining in tooling but to change from press metal tooling to plastic injection moulding.

This lack of exit strategy for other firms had also been identified by respondent C9, "…. the exit strategy for most companies here is to slowly wind back…. very, very rarely do tool rooms get sold or taken over". C9 goes on to offer the cluster itself as a form of exit strategy in that other firms involved in the cluster which have come to know your business and have an interest in keeping the cluster going at its current level of resources may look to buy out a collaborating partner.

While there were a number of commonalities between the firms in Victoria and South Australia there was a difference in their outlook of where future work would be sourced. The main difference was in the South Australian firms who were focusing on upcoming defence projects as an area in which their skills could be employed. The Victorian firms saw repositioning themselves for the automotive industry as their main option, while a few of the firms saw opportunities in aerospace, primarily due to work which had been won for a new military aircraft project and had been earmarked for Australian industry.

Many of the interviewed firms are family owned or started as a family business and as one owner pointed out, in a declining industry your exit strategies are limited. C6 indicated that in the past he would have tried to sell the business to another tooling firm or perhaps even to one of the employees. But in a declining market it is very difficult to attract someone to buy the business; this was particularly disheartening for this owner as it was a business he had built from scratch many years prior. This business had already laid off workers and was only running at a fraction of its capacity, "I used to employ thirty people here and now I am down to eight and I have a lot of equipment sitting here doing nothing". The owner suggested that he would have to slowly wind down the business and eventually sell his machinery and close the doors. It was also interesting to note that this owner stated "We have Chinese tools on the floor, they are built in China and they don't work ….we fix them up. We have survived the last year and half doing that".

The company view of their perceived options in terms of exist strategy also appeared to have an influence on whether or not collaboration was seen as a viable alternative. Firms without a strategy to combat the challenges of an increasingly difficult industry acknowledged that collaboration was an alternative option but did not have plans themselves to partake in collaboration. While other firms appeared to be disillusioned with the industry and resigned to accepting that their business was winding down and hence would not consider collaboration as an alternative.

Other firms have also identified this problem but have taken a more proactive approach to the declining industry and have looked to exit the industry. These firms appeared more driven towards the concept of clustering both within the automotive sector and also outside. Firm C11 was driven to collaboration by the reduced options available to the firm in a decreasing market. While Firm C9, after experiencing a 25% decline in sales revenue, has joined a Tooling Australia sponsored conference to attempt to obtain defence force work.

5.3 Marketing benefits

One of the ideas behind the TIFA Aerospace cluster was the development of a generic brand which would be operated by the industry association for the use of financial members. This assisted firms with the ability present to OEM's as a single entity. The two prime firms had differing perspectives on the success of this concept, although the Tooling Australia respondent was very supportive of the idea and indicated it was well received by both the industry and customers. Essentially when presenting to Boeing for the purpose of quoting on work this was done under the TIFA Aerospace name, and hence gave Boeing a single point of contact.

Firm C9 advised from international attention to the tiered TIFA Aerospace model, TIFA was approached to see if the same thing could be done in the Australian automotive sector with particular interest from Ford India. Following on from this interest a new brand name has been established, TAAG, this stands for Tooling Australia Automotive Group. The industry association has looked at two areas of the industry, press tools and plastic moulding, and identified the industry capability in these areas. Brochures and trade missions outlining this industry based skill are then marketed globally using the TAAG brand. Once a customer expresses an interest in the capabilities they are directed to the industry association who entices the customer to speak with the industry at which point contact is passed over to the industry members. As identified by the Tooling Australia respondent they provide a professional point of contact but do not have the technical know how to quote (Tooling Australia respondent 2006). Firm C9 is a part of the initial clusters of three firms to use the TAAG name in order to meet future work on Ford projects across India and Europe. Furthermore, using the TAAG banner, C9 and the two other Tier one companies attended a trade conference in Frankfurt which is described by the C9 respondent. "We had brochures manufactured…. you had three independent companies that are fiercely competitive in Australia that sold themselves and their services as one group under the TAAG banner". This core group went further to

demonstrate their commitment to the concept and employed a contractor to be a facilitator for the group and provide their potential customers with a single point of contact.

While not having an active role in TIFA Aerospace, firm A12 could see the benefits of such an arrangement, “it enables them to market internationally at a level that they couldn’t do as individual companies”. A12 went on to say “I think from a marketing point of view it gave the aerospace industry one name, one voice to communicate with and it highlighted to the end user that the Australian industry was able to work together.’

With the success of marketing ventures such as TIFA Aerospace other firms in the industry have also been driven to use this joint marketing approach to collaborate and present to OEM’s as a single point of contact offering turnkey solutions. The development and participation in the TAAG group is one example while a similar concept was independently undertaken by a group of tooling firms including respondent C11, one of the non participating South Australian firms. The respondent for this firm outlined that a group of five firms collaborated to establish a company as a separate entity and name in order to source new work for the group, with each company holding 20% ownership of the firm. The firm employed marketing persons who were responsible for marking the capabilities of the company to the international market in order to obtain projects that were beyond the scope of individual companies. To date the independent firm has provided mixed results.

5.4 What level of the supply chian?

The respondent from firm A10 offered a unique perspective amongst the interviewees, as unlike the other firms they did not see a need for collaboration at the industry level. Being a larger firm, offering a range of tooling skills the need to collaborate for additional work or skills did not exist. It was suggested that work obtained through collaboration would have been obtained in any case as this firm was one of only a few firms who had the capability and capacity to meet work requirements. Interestingly though, collaboration as an idea was not dismissed in total. The respondent commented that collaboration at the

firm level was too difficult due to the closeness of the firms. In deed this was confirmed by the Tooling Australia representative, "….it took eight months for those companies to get in the same room and talk about whether or not they were prepared to do this (collaborate)" (Tooling Australia respondent 2006). Perhaps it is this closeness of the firms which is acting as a barrier for the establishment of successful clusters in the automotive and aerospace industries. The closer firms are to each other in aspects such as size, customer bases and output the more likely that real and perceived issues will be experienced. Issues of trust based around issues such as intellectual property and resource sharing may prove to be a barrier to the establishment of collaborations.

What was suggested though was that collaboration or clustering of a more complementary nature may be of more assistance and would need to take place at a higher level of the supply chain where there would be less conflict of interest and firms were more willing to share information for mutual benefit. Also firms of this size and nature are less likely to be family owned businesses.

Firm C9 had a different view of clustering and the supply chain, suggesting that a "natural supply chain" will form around their TAAG based cluster. This natural supply chain forms around firms with whom the tier one firms have worked with before and the component manufacturers who had worked with these companies as well. This picture offers a combination of both horizontal and vertical supply chain management and a sense of control over the clustering partners.

5.5 Family Business

Collaboration does offer itself as a viable option for these tooling firms to try and overcome the declining industry, however despite efforts by both firms themselves and the industry association the level of success has been limited. One possible explanation or suggestion for this was offered by both the Tooling Australia representative and two of the larger tooling firms. The suggestion relates to the ownership structure of many of the tooling companies, being small with relatively few employees and more importantly family owned. Many of the firms are first or second generation family businesses and as

identified by the Tooling Australia respondent “for some of those people who have been in the industry for so long and being involved in the company for so long, particularly were it is family owned they are stuck in their ways and they want to make change and want to see change, but don’t act” (Tooling Australia respondent 2006).

It is this instilled pride which is compounding the already identified difficulties facing these firms, problems such as increased globalisation and a declining automotive industry. But at the same time it is also a perfect example of why firms should be coming together in collaboration. By joining forces these firms will be able to draw on the pride they have in their business and combine this with the flexibility of being a small company in order to better secure their future in an increasingly challenging competitive environment. Until these businesses and business owners are able to overcome the pride and emotion attached to their business it will continue to be a barrier to these firms fully embracing collaboration as a legitimate means of operating their businesses.

6.0 Conclusions and continuation of the research

The existing literature provides a useful background from which to explore clusters, however much of the existing literature is generic or based on overseas experience. This research is based on an industry funded project which is providing a retrospective multiple case study analysis of three clusters in the Australian tooling industry. The complete research project has not yet been completed and more data will be collected, however there have been some interesting initial findings for the analysis of data collected to date. The paper has identified some of the key drivers and barriers which are playing a part in cluster formation and success (or otherwise) within Australian manufacturing.

Both the previously reported research on clusters and the research reported herein conclude that one of the main drivers for firms coming together in a network and/or cluster is to attempt to address the common OEM desire for reduced supplier bases. This driver is very closely accompanied by the perceived advantage of increased marketability to a global market. But the question remains whether these drivers

will prove strong enough to allow the industry to collaborate and overcome the impact of the low cost Chinese presence on the Australian tooling industry. The impact of China and general decline of the industry appears as two of the greatest barriers to clustering with in the tooling industry and to the industry itself. This is further complicated by the existence of personal ties to the business which may also be influencing the potential exit from the industry and may also be a reason why more complimentary collaborations are viewed as more favourable.

The research to date has involved thirteen face to face interviews plus a range of other observational data collection and secondary information source analysis. The remaining firms will be contacted by mail and phone over the coming months in order to request further interviews with managers of firms who have been involved in the clusters regardless of whether they have actually participated in the work or simply expressed an interest in collaboration. With more data and analysis the issues presented through the thematic analysis will be expanded and explored in more detail and rigour.

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