

The Evolution of Some Collaborative Marketing Networks of SME's

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Abstract

Many small manufacturing firms are becoming dislinked from their traditional client connections as those larger manufacturing clients strive to reduce costs by either moving production to lower cost countries or working with fewer, more capable suppliers. This paper explores learnings from a case study project (RELINK) where relatively large numbers of SME's combined their resources to establish new supply chain linkages in both domestic and international markets. Both a form of narrative sequence analysis and complexity theory is used to identify key events and some actor interdependencies. The project was stimulated by two industry associations who played a vital role in exploring opportunities. But as the participating firms, who were normally competitors, started to do things together, a range of spinoff projects were rapidly established independent of those associations. The firms had some success in accessing international opportunities by presenting their combined capabilities and a business model for working together to new clients. The evolutionary pathway observed was related to a series of antecedent events that were only evident in retrospect, and to the emergence of some collaborating focal firms that could organise smaller firms to support them. A balance between the ways the focal firms were similar and the ways they were complementary is seen as important in establishing sustainable collaboration. Some ideas based on complexity theory are used to discuss managing in circumstances where there are multiple contingent factors.

Keywords: supply chains, marketing practices, SME's.

Introduction

It is observed that, due to the effects of globalisation, many small firms in the manufacturing sector must find new ways to compete (e.g., McNamara, 2003). Small contract manufacturing or toolmaking firms have traditionally been part of a vertically integrated supply chain where they were linked with product manufacturers and distributors. As these client companies move production offshore, or as they seek to reduce their internal costs by dealing with fewer suppliers, linkages with the small companies are broken. In 2004, an Australian project (RELINK, 2004) was initiated to provide a practical demonstration to small firms that innovations are available to enable them to participate with medium and large firms in turnkey projects as part of a supply chain. It was based on the potential for establishing large-scale virtual organisations of collaborating firms linked by a common vision and a set of business practices that are supported by information and communication technology (ICT) tools. The project was funded via a combination of cash from the Australian Government Innovation Access Program (IaccP – Industry) and in-kind contributions from two Industry Associations and their members. The project started in May 2004, and the completion date was April 2006. Three different kinds of demonstration projects were initiated, and some of these have led to spin-off opportunities.

But first, some case background. One Industry Association, the Federation of Automotive Products Manufacturers (FAPM) represents the tier one and tier two suppliers in the Australian automotive industry. Most member firms are medium to large in size, but there are some small firms involved. Some members are part of a multinational firm, some are Australian firms that also have operations outside of Australia, and some are family owned businesses operating only within Australia. The second Industry Association is TIFA, the Tooling Industry Forum of Australia. The toolmakers provide a service to designers and to manufacturing firms, with the automotive industry being the Dominant market sector. TIFA members are primarily small family owned businesses that service the domestic market, and the average firm size is about twelve employees. Sometimes the toolmakers may need to collaborate in both vertical and horizontal networks, and sometimes these network members may compete. The CEO's of both Industry Associations saw a need for members to collaborate in a globalized business environment. Some participants had prior experience of collaborative ventures (Marceau, 1999) and some did not. Some participants said they wanted to collaborate, but were really only prepared to cooperate under some conditions (Beckett 2005). These factors introduced both path and actor dependencies in the way each of the RELINK demonstration projects evolved. Two research partners, The University of Western Sydney (UWS), and the CSIRO (Commonwealth Science and Industry Association), were also involved in the project to inject ideas relating to the application of collaboration methodologies and ICT technologies

The purpose of this paper is to identify some lessons learned from the RELINK project, starting with a discussion of the research context and a case description

The research context

From the viewpoint of the industry participants in the RELINK project, the only useful outcome would be an improvement in their market positioning. From the viewpoint of some other stakeholders, such as the Australian Government sponsor organization, a better understanding of success factors in stimulating SME collaborations was important. This led to two research questions:

1. How has the RELINK initiative improved the market position of participating firms
2. what success factors have been observed as important in stimulating large scale SME collaborations

Data was collected over a two year period from participation in project meetings, review of records from past project meetings, direct discussion with some of the actors, at a more macro level, from Australian Bureau of Statistics information on the relevant industry sector and business conditions surveys of by the industry associations. The purpose was to establish both macro and micro environment contexts.

Event mapping was used in RELINK project case analysis, adapting some ideas espoused at a recent IMP conference (Buttriss, Wilkinson, Andersson, and Mattson, 2005) Some key events were identified to better understand some of the dynamic factors at work. Some characterizations of different modes of collaboration and different generic actors emerging from studies of virtual enterprises (Camarinha-Matos and Afsarmanesh, 2004)) was used to categorize the RELINK activities and actors. Complexity Theory view (Snowden, 2005) suggests that circumstances where cause and effect are only coherent in retrospect are characteristics of a complex un-ordered domain. Management in this domain is not on the basis of desired or predictable outcomes, but is focused on the management of attractors around which patterns form. This idea was also used to better understand RELINK project observations and how they might be utilized in other circumstances.

The Case Study Project

In the case study project it was intended to establish three demonstration projects to explore different ways that small firms might work together. At the launch of the RELINK project, members of the two Industry Associations were invited to participate, and some 40 firms responded. Via briefing sessions and discussions with individual firms, two suggestions emerged. Firstly, wherever possible, build on currently evident market opportunities, as the lead time of many client projects was quite long, precluding any significant startup phase action during the two year duration of the project; and secondly arrangements that activate under-utilized assets should be promoted. The FAPM members took a somewhat strategic view, drawing on experience with some of the demonstration projects, ideas emerging in the automotive industry overseas and broader studies of large scale collaborations being carried out by a UWS PhD student. The TIFA members actively supported trying out ideas on real commercial opportunities. The following notes provide a brief overview of three different kinds of demonstration projects that were supported.

Agilenet

This demonstration project sought to establish a network version of an agile manufacturing enterprise. It has been observed that some participants (toolmakers in particular) have some infrequently used machines. At the same time, it has been observed that many clients want to contract out complete packages of work rather than split it between specialist suppliers, and some traditional suppliers to those firms may not have the full repertoire of capabilities needed. The industry associations brought together firms in local regions having complementary kinds of capability to rapidly respond to client needs. However, it was up to the individual firms to call on each other's resources. A few firms in one region have cooperated in this way at the time of writing, and some firms in another region have formed their own peer configuration local networks. The focus has been on short-term domestic market opportunities.

Formnet

During an export trade mission in 2002, it was observed that there might be opportunities in large automotive press metal tooling. A TIFA working group was formed and client requirements identified. One requirement was for tool tryout, but no large press facilities were available to Australian toolmakers for this purpose. Since that time, some Australian toolmakers have installed suitable presses, and have started to establish a global customer base. Re-starting some variant of the original working group was seen as a potential RELINK demonstration project that could assemble a depth of expertise related to press metal forming. This group, which comprises six focal firms, has undertaken a trade mission to the USA focused on automotive industry opportunities, and has hosted a potential automotive client from China. Some of the network participants are using other members as subcontractors in projects they win as individual companies, but they are emphasizing the additional resources available when talking to potential clients. Two of the participating firms in particular have developed their own export market networks, and are apprehensive about having others intrude on the working arrangements established. These firms are however quite happy to support others in establishing clearly separate market networks. Thus we see that sometimes these firms may be competitors and sometimes they may cooperate, but only in a hub and spoke configuration.

TIFA Aerospace

This is the most advanced of the three demonstration projects. In 2002/2003 some small Australian toolmaking firms began to collaborate to access an international aerospace project. Subsequently, a formal larger scale collaboration promoting their collective capabilities under a newly created national brand name was established. The network that has been established was driven by the second project opportunity, but some see this network as an ongoing entity and a model for application in other market sectors. In parallel with the formation of the network (called TIFA Aerospace), some industry technology roadmapping studies were undertaken. Focus groups, individual interviews and desktop studies were used to collect data on both technology and business issues confronting toolmakers. One broadly based study considered the trends in a number of client market sectors, and the technology needed to service those future requirements. A second study considered similar things, but was more narrowly focused on the aerospace component manufacturing sector. The technology roadmapping studies suggested that small toolmaking firms needed to collaborate to both enhance technology acquisition capacity and to enhance market positioning, and that the emerging TIFA Aerospace network should be actively supported beyond the one client project that initiated it.

The original TIFA Aerospace network was configured around three focal firms (with many years of experience making tooling for the Australian Aerospace industry) and an industry association, potentially involving up to 60 small firms, depending on capability and capacity needs. One of the firms had prior experience with collaborative ventures, but the others did not. Two of the firms regarded each other as significant competitors. The focal firms considered forming a joint venture company, but did not proceed with this idea. TIFA decided to promote the collective industry capability using TIFA Aerospace as a brand name that encapsulated the collaborative business model. Client firms were attracted on the one hand by the joint industry approach, but concerned on the other that competition might be restricted by only having one source of supply in Australia. In the TIFA Aerospace business model therefore, contracting packages of work is through the three focal firms directly, not with a collective entity, and these firms distribute smaller packages of work as required – a hub and spoke configuration.

The focal firms have been successful in winning new business, and for the first time have won contracts with overseas aerospace firms. The industry association has found the business model also attracted interest in the automotive industry.

Spin-off Projects

The TIFA Aerospace business model has been presented in a number of international forums, and has helped establish dialogue relating to spin-off opportunities in the USA, Europe and India. The emphasis being placed on collaboration is catching on with the Industry Association members, and a collaborative research initiative is also being explored. Some of the spinoff activities have associated antecedent drivers outside of the RELINK frame of reference. It is anticipated that the spinoff projects will provide the industry partners with more opportunities in the future than would further development of the original three demonstration projects. Three spinoff activities will be briefly discussed. The TAAG (Tooling Australia Automotive Group) initiative was stimulated by TIFA members drawing on the ideas from the Formnet and TIFA Aerospace demonstration projects. Brochures describing the combined capabilities of firms in plastic mold and press metal tool subgroups have been produced, and opportunities to bid to new international clients on packages of work that represent several years of sales for a typical participating firm have been realized. The TIFA Research initiative recognizes that many clients would like to see their suppliers undertaking more technology research, but this can be difficult for individual small firms. Consequently the industry Association (TIFA) is developing formal relationships with research providers and acting as a conduit for small firms to participate in larger R&D projects. The FAPM Team Australia initiative draws on an antecedent idea from an Australian aerospace activity where focused capability teams offer their products as possible packaged solutions (e.g. car interior or drivetrain in an automotive context) to international clients. Linkages between antecedent activities, the three RELINK demonstration projects and the spinoffs observed are shown in figure 1.

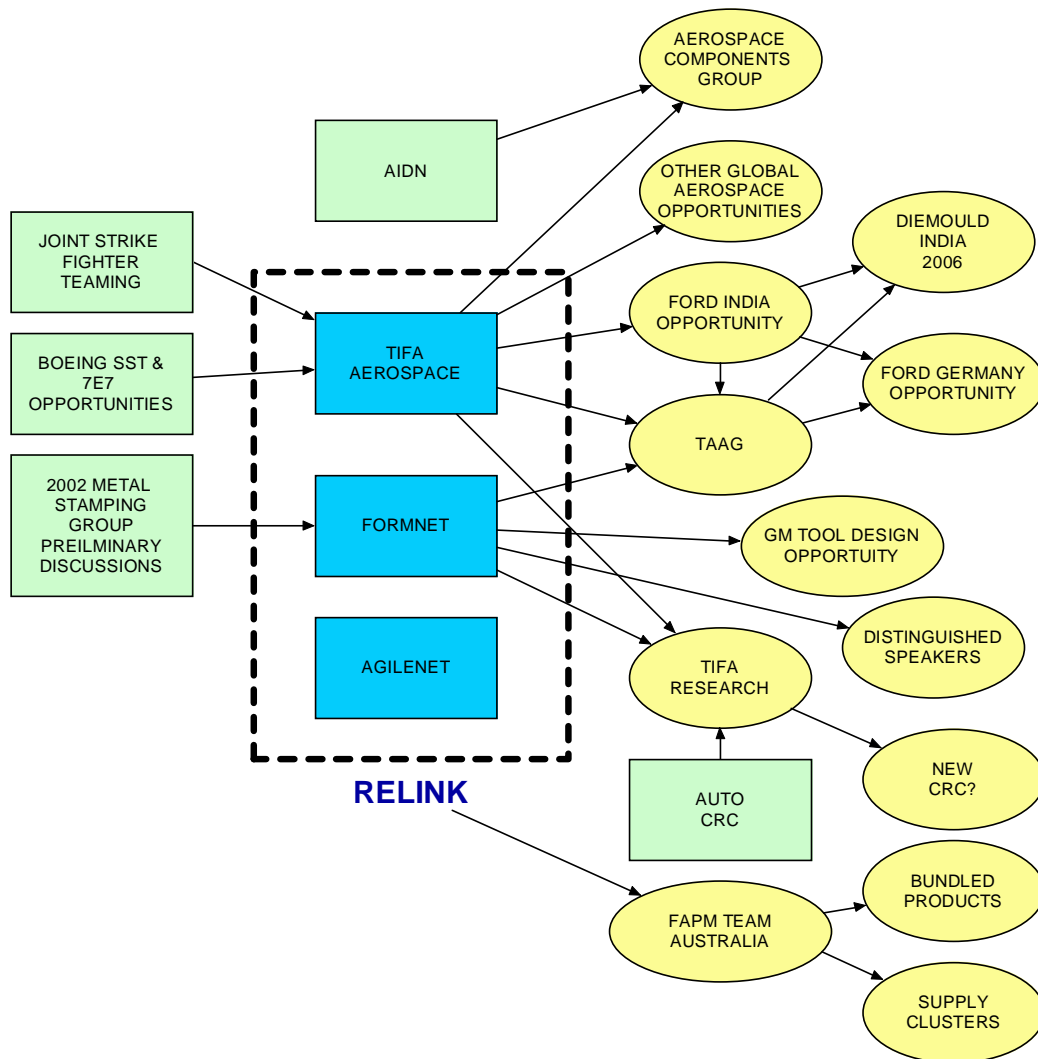


Figure 1: Demonstration project antecedent and spinoff linkages

Technology diffusion activities

One RELINK demonstration project requirement was to broadcast lessons learned, and this was generally achieved via public presentations to TIFA and FAPM members in several Australian States. In total, more than 200 firms were involved. Questions from the audience generally related to business opportunities generated, to economic benefits realized and to issues in having competitors collaborate. In one State, semistructured interviews built around the two research questions were also conducted with seven firms. What emerged was that significant social capital had been built in previous years through some State Government initiatives, and the firms interviewed were all collaborating informally in some way. Many of the smaller firms were also diversifying into short run precision manufacturing, and the larger firms were sustaining a high level of toolmaking activity by accessing overseas markets, using smaller toolmaking firms to carry out simple tasks. Hub and spoke arrangements were the most common configurations. Two focal (hub) firms that did not participate in the RELINK project directly (but offered support if required) were interviewed. It was clear that both were operating as extended enterprises, specializing in certain technologies and in project management, and drawing on other nearby firms for support. Their selection of partners was influenced by social capital built over many years. Both of these firms had a presence in the USA, their major export market.

Macro-economic Conditions

In many respects, the SME firms involved in the RELINK project are both constrained by and driven by macro-economic conditions. As individual firms, their capacity to invest in new technology or in

developing new markets is limited, wage structures, regulatory requirements and work practices are dictated by local norms (generally increasing costs), whilst product pricing is becoming driven by global norms (generally reducing price). And yet there are imperatives to engage with the global economy.

The Internationalization of trade

Drawing on research by the consulting firm McKinsey & Company, Bryan, Fraser, Oppenheim and Rall (1999:3) observed economies in transition – “Today almost 20% of world output – about \$6 trillion of the \$28 trillion world gross domestic product (GDP) – is produced and consumed in global markets. Within 30 years we estimate at least 80% of world output will be in global markets. By then, the worldwide GDP will be \$91 trillion”. This trend is very evident in Australian economic statistics, where both imports and exports are growing strongly. In the Australian automotive sector the number of vehicles sold continues to rise slowly and locally manufactured vehicles and components are being exported, (whereas this was rare in past decades), but the number of locally made vehicles sold in Australia is reducing. Bryan et al (1999:207) see “Twenty years from now, some \$50 trillion of globally integrated economic activity will permit an extraordinary degree of specialization” with one likely outcome up to “5,000,000 tightly defined “global nanostructures” representing \$10 million of production each”. The message for Australian manufacturing firms would seem to be clear – find a global niche to replace traditional domestic markets.

A TIFA survey

In Q3, 2005 TIFA conducted a member business climate survey. Overall, respondents saw employment levels as stable or declining slightly, but the industry structure was changing. The smallest firms with less than 10 employees were shrinking, and the larger firms with more than 50 employees were growing, particularly those trading internationally and pursuing some form of product diversification. The majority of firms in the middle were apprehensive about future business conditions, with declining order books. These patterns were reinforced in interviews with seven firms in one State which suggested toolmaking was becoming a lesser activity for some smaller firms, although they were still retaining a core capability in that field. All firms interviewed were particularly concerned about onerous payment conditions being imposed by automotive industry clients (who historically consume more than 50% of all tooling made in Australia) that flowed down from practices being driven by global motor vehicle manufacturers. One firm that was located close to a motor vehicle manufacturer was refusing automotive work when it was offered for this reason.

FAPM surveys

In 2005 a consulting firm conducted a review for the FAPM, interviewing people from the four Australian automobile manufacturing firms, several FAPM members who were tier one suppliers to these firms, and suppliers to the tier one members. The interview program indicated that continuing pressure for price reduction, global sourcing and somewhat aggressive arms-length relationships right down the supply chain were industry norms. There is a perceived need to collaborate, and this was a theme at the 2005 FAPM annual convention, however only 3 out of 30 people attending a workshop on collaboration practices had any prior experience with collaboration. At a similar convention in the USA in January 2006, the theme was “urgency to collaborate”, as the vehicle manufacturers generally plan to reduce the number of suppliers they deal with directly to about one-third of the current number, and this effect will flow down to Australian suppliers to Ford and General Motors.

Analysis of observations

The RELINK project evolved in a dynamic way, with the initial development strategy being altered early on, and with an initial reluctance of competitors to collaborate. But this changed due to emergent internal and external factors. The analysis begins by considering an observed sequence of events.

Sequence analysis

Table 1 simply lists some antecedent and project activities in broad chronological order

Timeline	Event
Pre-2002	<p>In the mid 1990's, the Australian Government encouraged SME's to form small business networks, generally with the intention of encouraging export activities. The Government funded external facilitators to help. The program was stopped after a few years, and when the external facilitation was withdrawn, most networks stopped functioning. However a few firms did remain active in the export market</p>
2002	<p>The Australian Government selected the US F35 (JSF) military aircraft, which opened up opportunities for Australian firms to bid for work. Small Australian firms clustered together (Industry Capability Teams) to present their capabilities. Some toolmaking firms agreed to participate, and were requested by prospective clients to work together to put in one bid for work on offer, which would then be compared with bids from elsewhere in the world.</p> <p>A separate group of toolmakers had seen possible market opportunities to make large pressed panel tools, primarily for the automotive industry, and their industry association facilitated number of meetings to further explore possibilities. Some progress was made, for example agreeing quality standards to be met, but the idea of seeking export markets together lapsed for a number of reasons.</p> <p>FAPM convention theme: Navigating the 21st century</p>
2003	<p>Boeing representatives visited Australia to seek out aerospace toolmaking capacity to service an expected peak in demand in their 787 aircraft development program. The Toolmaking industry association, TIFA, organized meetings and cost estimating studies to benchmark competitiveness. A collaborative business model was constructed, with the team being promoted under the umbrella name of TIFA Aerospace.</p> <p>FAPM convention theme: Beyond commodity – the new supply chain</p> <p>A proposal was put to the Australian Government to establish the RELINK project based on some ideas enunciated at an academic conference in Mexico</p>
2004	<p>The RELINK project proposal was endorsed in early 2004. A steering committee was established. The original plan called for collaboration working arrangements to be put in place, including some ICT tools. The steering committee did not endorse that strategy, but instead proposed to identify client industries interested in working with a collaborative team, with toolmaking firms leading the way.</p> <p>The TIFA Aerospace idea had been presented to an international conference of Boeing 787 project tier one suppliers, and was seen by the Boeing project engineers as an extemporary concept. Some tier one suppliers expressed interest in exploring possibilities further. The RELINK steering committee decided to try and launch TIFA Aerospace as an international brand, seeking markets beyond the initial 787 project opportunity</p> <p>The TIFA Aerospace idea was presented at an International toolmaking conference in Thailand, some interest in the business model from Ford India people attending led to a small opportunity to bid for work that involved establishing a team of Australian toolmakers very quickly, with some concerns from those excluded</p> <p>Some toolmaking firms had gained export orders for press metal tools, and had enhanced their internal capabilities to try out tools prior to delivery. It was decided to restart the Press tool network that stalled in 2002.</p> <p>FAPM convention theme: Global Futures: Reality Bites: Introduction of the RELINK project</p> <p>PhD student appointed to research large scale collaboration, some European auto industry clusters identified</p> <p>First TIFA international toolmaking industry conference</p>
2005	<p>The RELINK project mentioned by the Australian Minister for Industry and Trade in an interlocutory piece in the FAPM 2005 product directory, which is distributed worldwide</p> <p>US trade mission, mainly stimulated by Press tool network. Some interest and specific enquiries, but clearly a time of turbulence in the US auto industry</p> <p>Third demonstration project (Agilenet) initiated</p> <p>First toolmaking contracts let on the Boeing 787 project to TIFA Aerospace firms, Contracts from Australian and Japanese tier one suppliers.</p> <p>FAPM convention theme: Manufacturing's Future: What next, workshop on opportunities for success through collaborative innovation. Of the 30 or so attendees, only three had some prior experience with collaboration. Meeting with the Minister for Trade and Industry that discussed some collaboration possibilities.</p> <p>Proposal for spinoff activity, TIFA Research, endorsed by Governing Council, stimulated to some extent by a collaborative research initiative by some major clients (CRC-Auto)</p> <p>Formation of a spinoff activity (TAAG) and pursuit of first toolmaking opportunity in Europe. This developed from earlier discussions during the US trade mission, and the approach was based on the TIFA Aerospace business model</p> <p>Formation of spinoff activity by one TIFA member and two other firms with complementary capabilities to offer aerospace component manufacturing services. Concept firmed up by the group whilst attending the Paris Air show</p> <p>FAPM concept of a "Team Australia" integrated Capability Team for auto components emerges, with two spinoff possibilities – one bundling components into a package, the other working with the supply chain to seek improvements.</p>
2006	<p>Aggressive call for collaboration from the FAPM counterpart in the USA</p> <p>TIFA and TAAG group participation in Diemold, India, with some project possibilities identified</p> <p>TIFA new strategic plan agreed at annual general meeting. Name changed to Tooling Australia to project a more appropriate image in international markets, focus on supporting export firms plus innovation and research initiatives.</p> <p>Technology diffusion workshops to share lessons learned from the RELINK project</p> <p>FAPM convention theme: Knowing Tomorrow's Customer, workshop on Competitive Collaboration</p>

Table 1: An outline of RELINK project influence factors

Buttriss et al (2005:1) have suggested "-- a newly developed method for mapping and analyzing the sequences of events in case studies, Narrative Sequence Methods, can be used to enhance our

ability to identify and analyze the temporal processes underlying firm internationalization. Internationalization comprises a complex set of actions and interactions taking place within and between firms across cultures and nations over time and place. These include both planned and unplanned actions, reactions and interactions and expected and unexpected events. Different patterns of internationalization arise as a result of the impact of starting conditions, key events and critical junctures, and the timing and sequence of events in processes that constrain and enable the path taken.“ They note that the method had been developed in sociology, but less used in marketing and business studies. A variant of this idea is pursued below as a means of better understanding some of the complexities behind the RELINK project outcomes

Antecedent events that have influenced some of the actors prior to the commencement of the RELINK project have been noted (pre-2002, 2002, 2003). In the 2004 and 2005 time frames, a number of activities directly related to the project have been noted. In 2006, some indication of where the participants might be heading is presented. The themes selected for the FAPM annual conventions in each year have been included as a narrative representation of what was considered important in the business environment over the period. An expectation of change, new supply chain arrangements, globalization, concerns about manufacturing's future and the nature of tomorrow's customer are issues identified as the global automotive industry continues to change shape. An ongoing turbulent environment is expected. Similar pictures were evident in smaller scale TIFA meetings over the same timeframe. When the information in Table 1 is considered in concert with the linkage diagram shown in figure 1, it can be seen that whilst things may have happened fast in the later stages of the RELINK project, the supporting antecedent activities have happened over a longer timeframe.

The following is an identification of key events drawn from Table 1. The pre 2002 events built social capital and endowed some of the actors with experience in the operation of collaborative ventures. The 2002 events provided a practice field for some of the actors to work together. One, the JSF event was externally inspired, whilst the other, the press tool cluster was internally inspired. In 2003, two external events were noted – Boeings approach to the 787 project, and the identification of a collaboration idea from an academic conference, and one internal event – the creation of the TIFA Aerospace business model. From the viewpoint of the RELINK project participants, there were two significant events in 2004. One (external) was the presentation of the TIFA Aerospace business model at an international meeting of national toolmaking associations, which subsequently led to international opportunities via some of those present. The second (internal) was the RELINK steering committee decision to chase market prospects first, rather than focus on internal collaboration arrangements. This is contrary to the conventional wisdom of getting internal working arrangements in order first in establishing collaborative ventures. The argument put was simple. If prospective customers are not interested, then why bother. In 2005, internal activities dominated. One significant event was the trade mission to the USA, which of itself generated limited business opportunities, but the firms involved practiced presenting themselves as a group, and some of the informal discussions ultimately supported spinoff activities. The second significant event was the formation of the spinoff TAAG initiative. This is considered important because it was not pushed by the industry associations, but was initiated by the members. The third important event was the FAPM annual convention, where the most commonly used word was collaboration, whereas at the previous convention the most commonly used word was China (reflecting concerns about low cost imports). At this convention, meetings were held with the Australian Government Minister for Trade and Industry, leading to the “Team Australia” concept being developed. 2006 events indicate a change in industry association strategic thinking, moving away from a focus on competing with imports in the domestic market towards a focus on establishing a market position in the global market.

Whilst some further insights might be obtained from mapping linkages between these key events, this will not be attempted here. It is noted that some of the events designated as key were external from the viewpoint of the project fraternity, and some were internal. It is also noted that whilst the RELINK project was initiated as a strategic intervention with a planned program of activities, this was modified by market dynamics and changes in macroeconomic conditions over the duration of the project.

Path dependencies

It can be considered that if some of the key events noted in the previous discussion had not happened, for example Boeings need to access worldwide toolmaking capacity that led to the formulation of the TIFA Aerospace idea, then the RELINK project may have played out rather

differently. If certain actors had not been connected, for example via a trade mission, then the project may have played out differently. Sometimes the impetus was provided by a specific opportunity, and sometimes it arose from a background exploration of possibilities;

The initial focus was on specific client opportunities, but as each of the demonstration projects evolved, there were some clear differences between them. Some were founded on long term, relatively informal arrangements, some were established for the purpose of a specific project, and some were based on short-term resource supplementation. Camarinha-Matos and Afsarmanesh (2004) have described a number of manifestations of collaborative networks observed over a decade of experimentation with such arrangements in Europe (see Figure 2). In the RELINK program three of these: a Breeding Environment, a Virtual enterprise, and an Agile Shop Floor have emerged, with each one offering different kinds of participant benefits.

BREEDING ENVIRONMENT	VIRTUAL ENTERPRISE	PROFESSIONAL VIRTUAL COMMUNITY	VIRTUAL LABORATORY Mixed specialis & organisation network Specialised equipment access	AGILE SHOP FLOOR
Long term association, ready to collaborate	Temporary network, Goal oriented consortium	Network of specialist people Collaborative spaces		Dynamic cells of manufacturing resources
COLLABORATIVE NETWORKS Networks of autonomous organisations, people and resources common goals to be achieved via collaboration Agreed principles of operation and interoperable structures				

From Camarinha-Matos and Afsarmanesh (2004)

Figure 2: Some observed manifestations of collaborative networks

There are some curious parallels between the observations made in the RELINK project and the lessons learned in a number of US regional skill development programs reported by Chapple (2005) –

- *Chapple Lesson 1: Economic development is not an unambiguous notion: two paradigms informed the various projects.* These were initiatives to improve business competitiveness, and initiatives to improve the ability of community members to participate in the economy. In the RELINK project there is an unstated assumption that the participants can be globally competitive, and all they need is collaboration skills
- *Chapple Lesson 2: Collaboration is important, is difficult to achieve and takes at least two different forms.* They ranged from ‘an exploratory process of identifying differences and developing shared purposes to the more formal process of joint decision-making with shared responsibility’ (2005: vi). Chapple also saw that an intermediary was useful where there were a large number of stakeholders and the objective was only broadly defined. Joint ownership and shared responsibility was the norm when there were only a few stakeholders. There are parallels here with the RELINK breeding environment and virtual organization styles of collaboration
- *Chapple Lesson 3: Achieving simultaneous improvements in workforce and economic development is difficult.* One possible reason that the focal firms came to the fore in the RELINK project is that they had already achieved “improvements in the workforce” sufficient to be globally competitive.
- *Chapple Lesson 4: If better links between workforce and economic development are to be achieved, greater attention needs to be devoted to directly managing four contradictions or tensions.*
 - Who is connected: primarily businesses, or business and other relevant experts? This is similar to the kinds of relationships considered by Agnel, and Chetty, (2005) in relation to the internationalization of SME’s
 - On what basis are the connections built: networks of production, common output, common occupations or shared skill sets? The three RELINK demonstration projects sought to explore some different kinds of connection
 - What is the spatial setting of connection: region or locality? The spatial setting of connection in the RELINK project was primarily National and regional with the participants, but domestic and global with the clients

- What is the time horizon for action: short term or long term? In the RELINK project we have observed interplay between relatively informal longer term collaborations that explore possibilities and more formal shorter term collaborations that exploit them.

Chapple also makes some comments related to the funding of regional improvement initiatives that will not be considered here.

In summary, we see some path dependencies arising from internal and external events, some from the form of collaboration attempted, and some related to the pre-existing skills of the actors involved.

Actor dependencies

The generic actors involved were clients, the participating firms, their suppliers and the industry associations. A variety of client behaviors was observed, and different behaviors were observed within one client organization. Even where the client's top management and project leaders espoused the notion of supply chain collaboration, and particular champions supported the RELINK initiative, the purchasing department generally pursued an adversarial approach focused on price. In addition, whilst presentation of the collective capabilities of the collaborating firms opened the door to some opportunities, purchasing people did not like the idea of contracting with a collective. Basri (2001) found in a survey of innovative firms that chose to collaborate (the majority) that the most likely partner was the client. This is the dominant style of collaboration within the FAPM membership, and is a preferred arrangement with many TIFA members, who were apprehensive about multilateral relationships if they might impact their particular position with a client. Some of the participants saw each other as competitors, and in some interviews it was noted that there were concerns that creating a network of small firms would introduce a new significant competitor into the market. Some particular firms would not work with some particular other firms because of a past incident or because it might compromise a firm's competitive position in some way.

At the beginning of the RELINK project, a significant number of firms expressed interest in collaboration. As the project progressed, it became clear that this had several shades of meaning:

- full collaboration seen as a strategic imperative for survival in a globalized market, to be pursued regardless of difficulties
- conditional collaboration seen as a preparedness for full collaboration with certain other firms in certain markets
- conditional cooperation seen as necessary to stay in the game or cooperation restricted to a particular project

An observation made by Camarinha-Matos and Afsarmanesh (2004) in their study of many instances of collaboration is that there is likely to be a heterogeneous mix of generic actors who may have quite different reasons for participating. These are characterized below along with examples seen in the RELINK project:

- **Focal firms** that have demonstrated project management skills and can muster useful financial resources. In the RELINK project, these firms (commonly employing about 100 people) were critical to the success of a number of the initiatives taken
- **Technology providers** that supply tools and methodologies to the participating firms. In the RELINK project, the CSIRO introduced some web-based project management tools to the project
- **Regional networks** that may choose to operate outside their region as a single group. There was one group of this type interested in the RELINK project
- **Communities of Practice** that operate across firms to identify collective capabilities and facilitate interaction between firms. This was one role of the industry associations in the RELINK project
- **Supporting firms** that add capacity by providing access to some of their resources on a flexible basis. In the RELINK project, these firms, commonly employing about 10 people, clustered around the focal firms.

In discussing Inter-organisation Networks (ION), Biggiero and Sammarra (2001, p4) contend "...that identity and identification processes are particularly important to explain the structure and stability of IONs, including the networks based on the members' diversity, such as supplier-buyer networks. In many cases the rationale to build IONs is resource complementarity (Nohria and Garcia-Pont 1991) that implies diversity more than similarity between partners. In order to overcome the limitations of

previous theorising, this paper distinguishes two forms of network identity: *set identity*, based on perceived similarities among network members and *system identity*, based on perceived complementarities (interdependencies) among network members.” They use the dimensions of similarity and complementarity to characterise different kinds of networks, suggesting that if there is low complementarity and similarity there will be no network. High similarity and low complementarity is associated with set identity. “Identification based on self-categorisation leads to the emergence of *set identity*, based on similarity with respect to distinctive attributes of perceived social categories. The identification, in this case, does not require a previous direct interaction, but one mediated through symbols. Set identity presupposes the existence of perceived social categories. Even if the categorisation process is based on a cognitive action, *set identity is mainly characterised by a passive membership to a given set.*” (Biggiero and Sammarra, 2001. p11). Low similarity and high complementarity is associated with system identity. “Identification based on recursive interaction and direct social influence leads to the emergence of *system identity*, based on perceived complementarities and interdependence with respect to certain goals or activities. In this case neither categorisation nor structural equivalence is sufficient for the emergence of a system identity. For the emergence of system identity among diverse members the social influence of direct contact (or proximity) between social actors is the most influential factor.” (Biggiero and Sammarra, 2001. p12). In the RELINK project we have observed that similar firms (toolmakers) who may regard themselves as competitors start to work together as they find ways in which they can complement each other, and this is facilitated by close contact (in meetings or on trade missions). However finding this balance seems to take time.

The RELINK project is focused on finding better ways for SME’s to compete (a mode strategy) and on encouraging the internationalisation of business (a market strategy). Agnel, and Chetty, (2005) noted that both social and business relationships seemed to have some influence in the internationalization of 20 New Zealand and Swedish SME’s that they studied. Sometimes the relationships were directly connected with the business and sometimes they involved a third party. Table 2 shows eight scenarios they identified, and the numbers in the table are the number of instances observed. Business relationships had a greater influence than social ones, with third parties being most prominent in determining reactive market strategies. Where social relationships did have some influence, they rarely involved a third party. The number of reactive instances was greater than the number of proactive ones. Considered in this context, the RELINK project key events discussed earlier display some similar characteristics. Most of the external key events would lead to reactive change. Most of the events involved business, not social relationships. But the sequence suggests interplay between reactive and proactive initiatives, and interplay between the direct and indirect actors (in the RELINK case, the industry associations). The way the spinoff activates accelerated in the latter stages of the RELINK project suggests that the direct actors took control after the indirect actors showed what was possible.

Drivers of internationalisation market strategy and mode strategy			Direct and Indirect actor linkage scenarios	
			Direct	Indirect
Relationship actor level and type of change	Social relationship	Proactive change	Firm initiated change through direct link with individual Market strategy - 10 Mode strategy - 1	Firm initiated change through a third party individual Market strategy - 0 Mode strategy - 0
		Reactive change	Firm reacts – direct link with individual Market strategy - 6 Mode strategy - 7	Firm reacts through third party individual Market strategy - 1 Mode strategy - 1
	Business relationship	Proactive change	Firm initiated change through direct link with an organization Market strategy - 9 Mode strategy - 13	Firm initiated change through a link with a third party organization Market strategy - 4 Mode strategy - 3
		Reactive change	Firm reacts – a direct link with an organization Market strategy - 5 Mode strategy - 26	Firm reacts through a third party organization Market strategy - 24 Mode strategy - 6

Table 2: Examples of scenarios of strategic change and relationship related influences (Adapted from Agnel and Chetty. 2005)

Törnroos and Hedaa (2005) considered the role of intuition, time and timing in developing business relations in a turbulent environment, suggesting a number of dimensions (some of which have been discussed above)–

- Adaptive dimensions – complementarities and mutuality; ‘tuned’ and aligned relationships
- Social dimensions – ‘carrying-value’ and representational roles of actors; commitment, trust and social capital formation; timing and temporal sensing; co-cognition, co-emotion, communication; social skills
- Temporal dimensions – timing in networks, sensing/identifying kairotic moments; confluence in event trajectories; past and future loadedness of events; event networks and actor network connections
- Strategic dimensions – role, position and network horizons; ‘weak ties’ and ‘weak signals, duality and mutuality in management, opportunity structure and relationship potential; network embeddedness

We have observed that time is a scarce resource in smaller firms, limiting their capacity to act. A point made by Törnroos and Hedaa is that it takes time to develop business relationships, but when an opportunity arises decisions may have to be made quickly with minimal background information. A business opportunity in India provided an illustration of this in the RELINK project, where a team of three focal firms, each in a different State of Australia, combined to develop a response, and then visited India to bid for the work over a two week period. These three focal firms had not worked like this before, but the CEO’s knew each other (a social relationship in table 2). A representative from one firm went to India, but they all saw it as a strategic opportunity. Their bid was not successful, but it illustrated what could be done.

A Complexity theory view

How can we learn something from the RELINK project that can shape future attempts at large-scale collaborations when there so many contingencies – events, actors and macroeconomic factors? Some researchers are using a complexity theory approach to better understand such dynamics. Kurtz and Snowden (2003) suggest that the context of decision-making and problem-solving determines the most appropriate course of action, and they characterize four context domains, some where order is the norm, and some where un-order is the norm. A characterization of these domains is shown in table 3. Snowden (2005) argues that in the visible order domain, cause and effect are evident. In the hidden order domain, cause and effect are discoverable. In the complex un-order domain, cause and effect are evident in retrospect. In the chaotic un-order domain, cause and effect are not evident even in retrospect.

It is suggested here that the nature of the events and the market turbulence evident in the RELINK case are consistent with Snowden’s complex un-order domain. In this domain, the decision model (table 3) is based on probing the environment, sensing patterns and responding. It is suggested here that these are attributes of a breeding environment form of collaboration (see figure 2), where exploration of possibilities is the norm. But to extract value from possibilities, the actors need to move into exploitation mode where order is the norm. It is suggested here that a hidden order domain corresponding with the virtual enterprise activity in figure 2 would be consistent with one exploitation mode observed in the RELINK project where a number of focal firms established an oligarchy. When a contract is secured, the focal firms will interact with their suppliers and supporters in the visible order domain. It is further suggested that the agilenet activities illustrate a different exploitation mode, one of visible order, as one firm takes the lead to pursue an opportunity

It is observed that in the RELINK case there are transitions back and forth between ordered and un-ordered domains. Snowden (2005) sees this as a characteristic of innovation. From another point of view, the RELINK project has been about moving some of the participants from a domain of visible order into a domain of complex un-order to explore new possibilities. It was observed that the RELINK focal firms have all made transitions of this sort before, whether that be in starting to export or in launching an innovative product/process.

Attribute	Chaotic un-order domain	Complex un-order domain	Hidden order domain	Visible order domain
Decision model	Act –sense - respond	Probe –sense-respond	Sense – analyse - respond	Sense – categorise - respond
Practice	Novel practice, avoidance of failure	Worst practice, avoidance of failure	Good practice, limitation of success	Best practice, imitation of success
Related techniques	Sensemaking, narrative and network management	Sensemaking, narrative and network management	Systems thinking, scenario planning, market intelligence	Process re-engineering, standard operating procedures
Nature of knowing	Emergent, experimental, uncertain, knowledge of conditions but not outcome	Emergent, experimental, uncertain, knowledge of conditions but not outcome	Empirical, hypothesis based, objective validation or repudiation	Empirical, hypothesis based, objective validation or repudiation
Nature of management	Decisive-directive	Information - consensual	Oligarchic - consensual	Hierarchical - directive
Network	No connections	Tightly connected network, loosely connected centre	Tightly connected centre, tightly connected network	Tightly connected centre, network connections irrelevant
Diagnostics	Every diagnostic action is an intervention, and every intervention is a diagnostic	Every diagnostic action is an intervention, and every intervention is a diagnostic	Diagnostic can be separated from intervention and do not impact on system behavior	Diagnostic can be separated from intervention and do not impact on system behavior
Illustrative legitimate domain use	As a source of innovation and new perspective	To enable selforganisation	Use of expert knowledge	Process control for safety
Illustrative illegitimate domain use	Accidental precipitation into crisis	Anarchy without control of any time	Refusal of experts to accept new ideas	Over control preventing progress
Focus	Effectiveness: allowing a degree of redundancy to create adaptive capacity	Effectiveness: allowing a degree of redundancy to create adaptive capacity	Efficiency: stripping away superfluous functions to maximize productivity	Efficiency: stripping away superfluous functions to maximize productivity
Nature	Exploration	Exploration	Exploitation	Exploitation

Table 3 some attributes of four decision-making and problem-solving domains (From Snowden, 2005)

Discussion

The purpose of the RELINK project was to demonstrate how large-scale collaboration could yield economic benefits for the firms involved. This would seem like a logical strategic initiative, and the outcomes indicate that the project has spawned a number of flow-on initiatives. However, the identification of key events would suggest that the outcomes are more a reaction to external factors than some logical progression of a strategic plan. We see that the pathways are actor-dependent, but we can also see that there are some generic kinds of actors involved. We see that there are both processes of exploration and processes of exploitation involved.

Research Question 1- How has the RELINK initiative improved the market position of participating firms

The RELINK initiative confirmed that large scale collaboration, potentially involving large numbers of SME's was practically possible in the manufacturing industry sectors involved, and that access to international markets can be enhanced.

The RELINK initiative has surfaced some regional collaboration activities that were sometimes occurring through formally established linkages, and sometimes informally with the notion of firms operating as a virtual extended enterprise (the agilenet demonstration project). These activities helped to build regional social capital, which emerged as an important background factor in other kinds of collaborative efforts.

Using the framework adopted by Agnel, and Chetty, (2005) (see Table 2), it can be said that market strategies for greater engagement with global projects in two industry sectors – aerospace component

and automotive components have been identified and two new engagement mode strategies have been demonstrated. These are collaborative marketing under a national brand name – in this case TIFA Aerospace and TAAG, and collective marketing by providing additional capacity and capability to support a focal firm tackling export markets.

The specific project opportunities pursued have been successful in attracting opportunities to bid on aerospace work that would potentially engage about 15% of the Australian industry toolmaking capacity. At the time of writing, there had been about a 30% conversion into contracts, but perhaps more importantly, some of those contracts were with new international clients. Opportunities have been attracted to bid on export automotive work for new clients that would potentially engage about 10% of the Australian industry toolmaking capacity. The status of conversion into contracts for these opportunities was not known at the time of writing.

The experience has been sufficiently encouraging for it to have some influence the industry associations involved in upgrading their strategic plans to include a focus on the new international market engagement modes demonstrated. The number of spinoff projects suggests that the firms involved found collaboration to be a useful strategy

Research Question 2 - what success factors have been observed as important in stimulating large scale SME collaborations

A number of antecedent events and activities that may have occurred years before were found to be important in that they provided a practice field for some of the ideas embodied in the RELINK project, and they built social capital between the firms involved. In particular, those firms that had trialed participation in business networks were more comfortable with trying it again. Curiously, many people in Government have seen the previous business networks program as a failure, but the experience here suggests this is not the case from a long term perspective. Narrative sequence methods helped identify key events in the variety of activities undertaken

Having a champion in the client organisation was seen as important, and in the RELINK project, the champions emerged in connection with key events that may not be reproducible. One was the short term need for capacity in the Boeing 787 aircraft development program, and the other was the presence of a client representative at an international conference where the TIFA Aerospace business model was discussed. None-the-less, this observation reinforced the intuitive view of the project steering committee that an initial focus on receptive clients rather than on internal collaboration practices should be given priority in project development.

The identification of receptive focal firms was seen to be very important in engaging with global markets. Building capability and capacity via the cooperation of a few focal firms that could in turn engage with smaller firms in a hub and spoke style emerged as the dominant arrangement. This was partly because most of the smaller firms did not have the absorptive capacity for direct engagement with global markets, and partly because client purchasing departments did not seem comfortable about dealing with a virtual enterprise or some kind of cartel

The whole evolutionary process seemed to involve ongoing interplay between the operations of a long term breeding network (see figure 2) that explores possibilities and the short term operation of a virtual enterprise or agile shop floor arrangement that exploits any opportunities identified. It was observed that the industry associations could play an important role in sustaining a breeding network, but had very little participation in the exploitation stage. Understanding the quite different dynamics and the interdependencies of these two forms of collaboration was seen as a success factor.

The firms involved in the RELINK demonstration projects would generally regard each other as competitors, and it was essential that some way in which the firms complemented each other was identified to form sustainable working arrangements. Some firms with an attitude of conditional cooperation may have been involved to provide capacity, but they were not seen as long term participants. In the Formnet demonstration project for example conditional collaboration was established by the firms reaching agreement to each pursue complementary international market sectors. Full collaboration was more frequently observed in the regional networks of smaller firms than between the focal firms. It seemed easier to get things started with complementary firms (for example, with the agilenet demonstration project participants), but harder to sustain the collaboration if they did

not find a common theme. It seemed hard to get competitors working together, but once some form of complementarity was found, the collaboration seemed self-sustaining. This view is illustrated by the kind of explosion in spinoff activities later in the RELINK project. Drawing on the observations of Biggiero and Sammarra (2001), it is considered that during the interplay between breeding environment network and the specific opportunity collaborations, better understanding between the actors leads to better balanced view of similarity and complementarity attributes.

It is suggested here that better understanding the effective operation of the breeding environment (figure 2) is a key success factor for the RELINK firms, as this is the interface between the turbulent macro-economic environment and identification and progression of specific opportunities. Snowden (2005) suggests that managing in this complex un-ordered domain involves understanding the multiple agents that patterns form around, and he calls these entities “attractors”. We suggest here that some attractors will relate to the market, and that some will relate to macroeconomic conditions such as currency exchange rate movements and government interventions. Some will relate to the nature of the actors - in particular, client champions and focal firms. Some, but not all of these attractors are currently monitored by industry associations, however the transition from identifying possibilities to exploiting them seems weak. It is suggested here that more engagement with focal firms should be pursued as a means of exploiting possibilities

Having a common understanding between the stakeholders of the mechanics of building a sustainable collaboration was seen as important. A model (shown in figure 3) that illustrates different factors influencing the imitation and sustainability of collaborations was used in the RELINK project. Initially it was used as an education aid, but later it was used in project progress reporting to compare the relative maturity of each of the demonstration projects.

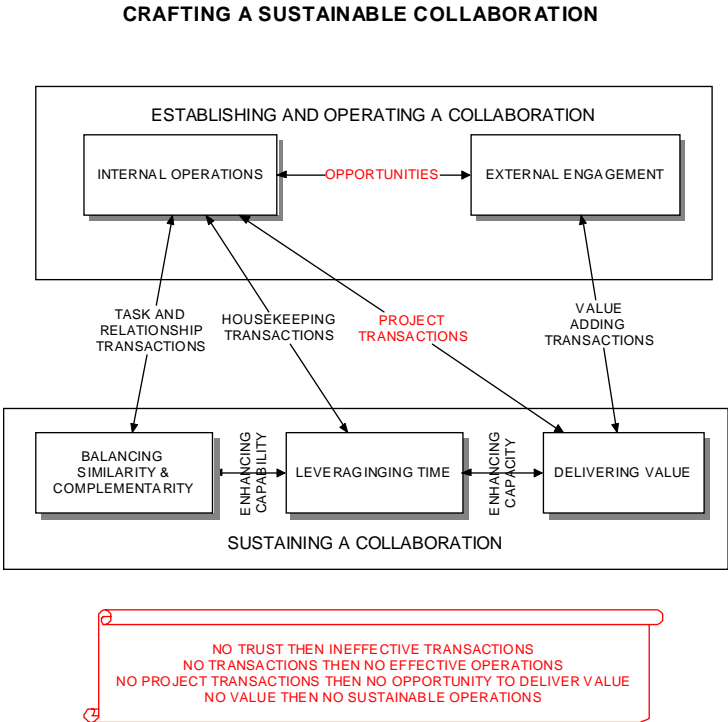


Figure 3: Key collaboration development and operational activities (Beckett, 2004)

Concluding Remarks

This paper considers the evolution of some collaborative marketing networks of SME's, and seeks to draw out lessons learned from a case study project. Presenting the combined capabilities of a group of SME's to a large client was more likely to lead to business opportunities than was each firm presenting itself separately. The case study participants feel that they have obtained benefit from participating, and certainly, there has been a change in attitude towards collaboration, resulting from improved engagement with some international markets. Figure 1 illustrates that there have been a significant number of spinoff activities from three case demonstration projects, and that some antecedent activities were important in evolving these projects and some spinoffs.

Closer examination involving a form of narrative sequence analysis indicated a number of key events that had significantly influenced how the marketing networks had evolved. It is speculated that had some of these events not occurred the evolutionary path might have been quite different. Nevertheless, identification with some generic kinds of collaboration and some generic kinds of actor that had been observed in other projects were also a feature of the RELINK project

The evolution process involved:

- some changes that were a reaction to a business environment change and some changes initiated proactively
- an interplay between exploring possibilities in a complex un-ordered problem-solving and decision-making domain and exploiting possibilities in an ordered domain
- the dominant actors finding balance in ways they were similar and ways they were complementary

It is suggested here that a focus on these three factors will be needed to sustain the networks established in the case project.

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