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Abstract

As in many other countries, the take-up rate of eCommerce in Australian SMEs has been poor. The Australian Government has attempted to address this (in part) through its 'Information Technology On-Line' (ITOL) program – a program that aims to accelerate the adoption of eCommerce through the provision of seed funding to on-line projects proposed by industry-based consortia. Some 81 projects have been funded so far and, in this paper, we review progress to date. While there have been some outstandingly successful projects, others have floundered. Provision of adequate project resources, together with effective change and relationship management, were identified as key critical success factors.

1.   Introduction

What we are witnessing in contemporary organizational life are the opportunities wrought by technological changes, most recently through web-based technology and the Internet. These shake traditional foundations of organizing and the very nature of organizations. New challenges are, therefore, confronting management across a diverse array of industries and government, and offer the likelihood, through economically viable new options, of new paradigms for organizational life, practices and processes, models, and relationships (Feeny, 2001).

There is widespread agreement, however, that the impact of online technologies has been very uneven, with a relatively small number of individuals and (particularly) companies quick to take advantage of new opportunities. This applies particularly to SMEs, a sector of the Australian economy where over one million companies provide jobs for almost five million members of the workforce (approximately 28% of the total Australian population). Yet, according to the Boston Consulting Group (2001), takeup of eCommerce by Australian SMEs is very slow – even by world standards. This is

somewhat surprising given that, according to most studies undertaken (e.g. NOIE, 2001; Boston Consulting Group, 2001), Australia rates very highly by international standards with regard to the percentage of its population connected to the Internet. It is also a matter of considerable concern for the Australian Government.

Reasons identified for the slow take up of eCommerce among Australian SMEs include a lack of strategic awareness; lack of technical knowledge; mistrust of technology; the 'what's in it for me' syndrome; high costs; and immediate, competing pressures (Boston Consulting Group, 2001). Another study (NOIE, 2001) suggests that among the major impediments to eCommerce uptake by small businesses are the lack of access to information and ICT skills, and the lack of practical experience in preparing, appreciating and applying a business case for eCommerce.

This is consistent with international experience. For example, Fife and Pereira (2002) demonstrate that lack of capital and skilled personnel, the high cost of eCommerce applications, and the need to re-engineer SMEs' core business processes remain as the most challenging impediments to the adoption of eCommerce applications by SMEs. For example, they point out that most estimates put the cost of establishing a web site at around $US15-17,000. Furthermore, in a recent survey of small businesses in the UK, 48% of respondents said that they did not have web sites and did not understand the potential benefits that might flow from eCommerce applications. In addition, only 50% of SMEs with web sites were using them to sell goods and services. In the US, 62% of SMEs reported not having web sites and only 12% were using them for online sales. The same research notes that since SMEs are part of some 80% of the supply chains of large corporations, these SMEs would require a re-engineering of their core business processes before both SMEs and large corporations can maximize eCommerce-generated cost savings (Fife and Pereira, 2002).

In an attempt to address these problems, the Australian Government has established its *Information Technology On-Line (ITOL)* program. This $13million program provides seed funding for diverse online activities, with the aim of encouraging and hastening eCommerce takeup among Australian organizations – particularly SMEs. ITOL commenced in 1996 and, in this paper, we report on a two-year study where we reviewed the program, its funded projects, collaborative arrangements between project consortia, problems and obstacles, and success measures. Complete details of our research are reported in (McGrath and More, 2002). In this paper, we focus mainly on the degree to which the program might be judged to have been successful (or otherwise) and the related issue of problems encountered. We also pay particular attention to relationship management – a critical issue, given that a fundamental feature of ITOL is its emphasis on collaboration between and among companies and other stakeholders.

2.   The ITOL Program

The ITOL Program (NOIE, 2001) aims to accelerate Australian adoption of eCommerce solutions: by providing seed funding for diverse activities that encourage collaborative industry based projects; by enhancing adoption of b2b practices across a wide range of industry sectors, especially by clusters of SMEs; and by fostering awareness and strategic take up of innovative eCommerce solutions within and across industry sectors - in order to deliver sustainable economy wide returns and contribute to increased competitiveness. Since the program began in 1996, ITOL has already provided $7.5 million (in seven funding rounds) to support 81 innovative eBusiness projects across a diverse range of industry sectors and geographic regions. The extension of the program will see over $13 million in additional funding available to the program through to 2006.

The range of projects is impressive and cluster around the following categories:

- *applied solutions* – projects designed to use online technology to provide solutions to everyday problems (e.g. Livestock Exchange Online).

- *data warehouse* – projects that will make industry information easier to access for businesses and consumers (e.g. Australian Tourism Data Warehouse).

- *industry network* – projects designed to establish extranets for a specific industry or sector (e.g. Screen Industries Online).

- *portal* – projects designed to encourage an industry or a region to move online by providing a specific facility (e.g. Water Industry Alliance Portal).

- *supply chain management* – projects designed to improve the flow of products and services (e.g. Office Products E-Commerce Network (OPEN)).

- *security solutions* – projects designed to develop technologies to address security concerns (e.g. Patient Centred Data using Smart Cards).

- *standards setting* – projects primarily designed to establish common standards for a particular industry (e.g. E-Hub: The Electrical & Data Cabling Industry EC Initiative).

- *others* – projects for training or eCommerce research (e.g. Electronic Commerce for SME Exporters).

National Office for the Information Economy (NOIE) CEO John Rimmer (ITOL Workshop, 29/3/01) explained his vision for NOIE as a key focal point in coordinating, advising and providing leadership for the Australian Government's consideration of Information Economic Issues. He emphasised the adoption of eBusiness and online systems within government and the development of an innovative supply side industry. He regarded the ITOL program as a "*catalyst for e-business adoption in the community,*" stressing the importance of a learning approach in projects, building capabilities and skills, broader learning in eCommerce for the wider community, and as an investment in Australia's future. Another NOIE Branch Manager, Phil Malone (ITOL Workshop, 29/3/01) emphasised NOIE's role as a broker and facilitator.

A recent report by Boston Consulting Group (2001; p.10) was positive in its assessment of ITOL, suggesting that:

> *Government policy to assist business adoption is off to a good start. NOIE has taken some excellent steps, and the government is rated highly in its 'light touch' approach to regulation. ... The ... ITOL program to assist private sector in exchange development ... is a welcome step. .... Government's role in e-business adoption is twofold: to facilitate, where possible, the private sector's rapid adoption of e-business; and to ensure that government itself comes online quickly and efficiently. In both of these areas, Australia has enjoyed strong early leadership.*

As we shall see, the results of our own study were somewhat more mixed, with some extremely successful projects, some abject failures and many more where the 'jury is still out'.

3.   Study Methodology

In our study, we aimed to address the following questions:

- To what extent have ITOL projects proved to be successful?

- What do the ITOL projects reveal about critical success factors for eCommerce projects?

- To what extent do the ITOL projects support current views related to eCommerce and new organizational forms enabled by the same?

In this paper, we focus mainly on the first two of these questions.

The study took approximately two years to complete and was conducted during 2001/2002. We used key concepts from knowledge management, organization studies and resource-based perspectives, and employed both quantitative and qualitative methods including:

- A literature review covering areas such as eCommerce, collaboration, strategic alliances, new organizational forms, diffusion of technology, organizational knowledge and learning, and critical success factors.

- A review of similar grant programs in other countries.

- Analysis of ITOL project files

- Participation in ITOL Peer Workshops.

- Interviews with key NOIE/ITOL personnel.

- Content analysis of publications such as government reports, company profiles, and relevant web sites.

- A survey sent to all 67 ITOL grant recipients with a response rate of 52%. The survey incorporated questions around the background of projects funded, the nature of collaboration, achievements, obstacles and outcomes, and comments on NOIE support.

- In-depth interviews, both face-to-face on site, and teleconferenced, each of approximately two hours duration with a representative group of 27 projects across each of the five funding rounds. These involved both successful and unsuccessful projects and those that were completed and ongoing. These were taped with permission and transcribed for analysis. The selection criteria related to innovation, degree of success (as rated by survey respondents), eCommerce readiness, collaboration experience, measurable community benefits, and scale and diversity.

- Quantitative data analysis of survey responses and qualitative data analysis of interview data.

In this research, success was defined in terms allied to that emphasised by Douma et al. (2000; p.581): *"as the degree to which ... partners achieve their alliance objectives."* Failure was defined in terms of not meeting objectives, although in some cases objectives had been modified or changed with experience and, in others, objectives had not been completely met because time and/or funding had run out. It is important to note, however, that, in a wider sense, a lack of success did not necessarily imply total failure, in that the ITOL program was structured such that all participants could benefit from the experiences of others through knowledge sharing processes.

Among some problems encountered during the research were the following:

- Some difficulty in getting up-to-date contact addresses for old ITOL projects, given that several of those in-charge of completed projects had moved on to other jobs and could no longer be located. In addition, a number of the consortia for the

different projects had disbanded or the partners were no longer in contact with each other.

- Some of those involved in the different projects claimed heavy workloads prevented them from participating in the research.

- Responses to both the survey and interview questions had to be assessed in light of the fact that grant recipients were probably reluctant to 'bite the hand that was feeding them'. To attempt to counter this, anonymity protocols were devised and rigorously enforced. Also, additional sources were referenced in cases where apparent inconsistencies were noted.

Results of our research are reported in detail in (McGrath and More, 2002). In the remainder of this paper, we focus mainly on findings related to project success and factors that influenced the same.

4.   Some Key Findings

4.1   Project Success Levels

Project success levels, as reported by survey respondents, are presented in Table 1.

Survey Question 18: **To what extent has the consortium met project goals and achieved desired outcomes?** **%**	
Barely met original goals	17.1
Satisfactorily met desired goals and outcomes	62.9
Exceeded original objectives	11.4
No response	8.6
Total	100.0

Table 1: Extent to Which Project Goals Were Achieved

On the surface, with 80% of survey respondents claiming to have met or exceeded their original goals, this is an excellent result. However, a degree of caution in interpreting these raw figures is warranted. Specifically: i) we suspect the success rate among the 48% of grant recipients who did not return the survey might be considerably lower – particularly as we could not locate some recipients and some consortia had disbanded; and ii) as noted previously, self-interest should not be discounted (particularly with a number of respondents stating that they intended to apply for further funding). We should also note that many goals were fairly modest, relating (for example) to the establishment of a very basic infrastructure on which future project phases might build. This is perfectly understandable given the average level of funding support was only of the order of $90,000 and that most projects were still in a very early phase. However, it does mean that the survey response to this question says little about critical success factors such as eventual buy-in by intended users, measurable business and community benefits etc.

Some projects, however, have achieved indisputable commercial success, a good example being TradeData. TradeData provides an information service to business and governments based on detailed up to date information on thousands of traded products. The data is sourced from Customs declarations. Using advanced data mining techniques, the system supplies valuable market information on the size and price structure of markets, it can assess market shares, identify market opportunities, and can assist in assessing the effectiveness of its customers' market strategies. The facility was established in the mid-1990s – as a joint undertaking of Victoria University's Centre for Strategic Economic Studies and the Department of Applied Economics. Following the award of an ITOL grant in 1997, development was undertaken that enabled the organization to develop and test its technology, leading to the spin-off of its commercial arm in 2000. The commercial venture is now self-sustaining and both its customer base and the range of its operations continue to expand. One of the company principals believes the ITOL grant was critical:

> *Without this [ITOL grant], we probably wouldn't be in the position we are now in… [It] has revolutionised our business… we can do all sorts of new analysis that we couldn't have done or even contemplated before… It's given us a twenty-fold increase in performance, [which] was all theory until this project (Interviews, 2001).*

TradeData is by no means alone. Other ITOL projects that have achieved commercial success include the Water Industry Alliance Portal (designed to promote commercial cooperation between South Australian SMEs involved in the water industry), the Australian Tourism Data Warehouse (an on-line tourism destination and marketing services application) and My Southwest (a portal, sponsored by the local Chamber of Commerce, designed to promote the South West region of Western Australia). More detail on the first of these ventures is presented later in the paper.

4.2   Project Motives

Many of the consortia included members who were industry associations, technology providers, and business enterprises. In most (80%) of the projects surveyed, collaboration for the project was initiated by the principal grant recipient. In a number of cases (20%), the consortium partners had worked together before. Partners were generally (54%) based in both metropolitan and non-metropolitan areas, in single or multiple Australian States. There were three projects whose consortium members were based in non-metropolitan areas exclusively and only one project surveyed that had a global scope or links to partners outside Australia. The notion of "co-opetition" (Ordanini and Pol, 2001; p.282) was brought to life in 30% of the projects surveyed where members of the consortium were collaborating with their competitors. The primary contribution of project partners was in the form of 'knowledge and expertise' with most of the principal grant recipients providing project management support.
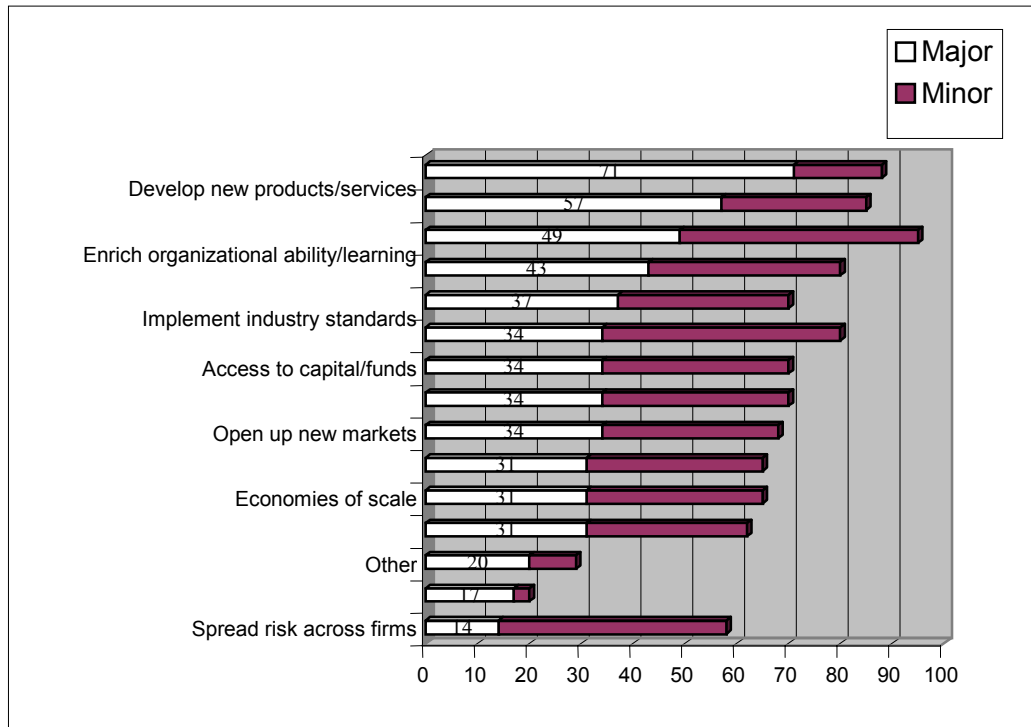
Figure 1: *Project Motives*

As is illustrated in Figure 1, The following were cited as the most important motives for establishing the consortium: i) to develop new products or services (71%); ii) to increase credibility (57%); iii) to enrich organizational ability and learning (49%); iv) to facilitate regional or international expansion (43%); and v) to implement industry standards (37%). Surprisingly, 77% said they did not form their consortium to effectively compete against a common competitor. Our findings provide some support for Yeshekel et al.'s (2001) theoretical explanations for parties entering strategic alliances: namely, to create synergistic and competitive advantages through expanding an organization's resource base; and to build an organization's skills and capacities through acquisition of specialized and vital knowledge from other organizations.

4.3 Project Schedules

Table 2: *Extent to Which Project Milestones Were Met*

__Survey Question 19__: **To what extent was the project able to meet most of its milestones?**	**%**
With significant delays	51.4
As planned	31.4
Ahead of schedule	8.6
No response	8.6
Total	100.0

At first glance, there is an apparent inconsistency here: specifically, 80% of respondents stated that they met or exceeded their project goals (see Table 1), yet 51.4% of the same

respondents reported significant delays (Table 2). In interviews, the reason for this discrepancy became apparent: namely, many of these projects were classed more as infrastructure development, research and development or 'proof of concept' exercises. As such, project schedules and milestones did not assume the same importance as they might in mission-critical, mainstream information systems developments.

4.4 *Problems Encountered*

Table 3: *Most Significant Type of Problem Encountered?*

<u>Survey Question 22</u>: **What type of problem most influenced the outcome of your project?**	**%**
Operational	25.7
Technology	25.7
Relationship	14.3
Change management	22.9
Standards	0
No response	11.4
Total	100.0

From Table 3, it is apparent that operational, technology and change management problems were considered (roughly) equally culpable when assessing reasons for difficulties encountered (leading to missed milestones and objectives not realized). Operational problems include aspects such as funding and resourcing difficulties; technical problems cover hardware, software and data communications difficulties; and change management problems include end-user resistance and lack of interest, resistance to innovation, power-political factors and the like. As implied, relationship problems refers to difficulties in managing consortia relationships; and standards problems include difficulties encountered in setting and conforming to agreed standards (and, in some cases, even finding appropriate standards). When these broad categories are broken down further, however, a somewhat different picture emerges. That is, respondents were asked whether or not they encountered specific types of problems and (partial) results are presented in Figure 2.
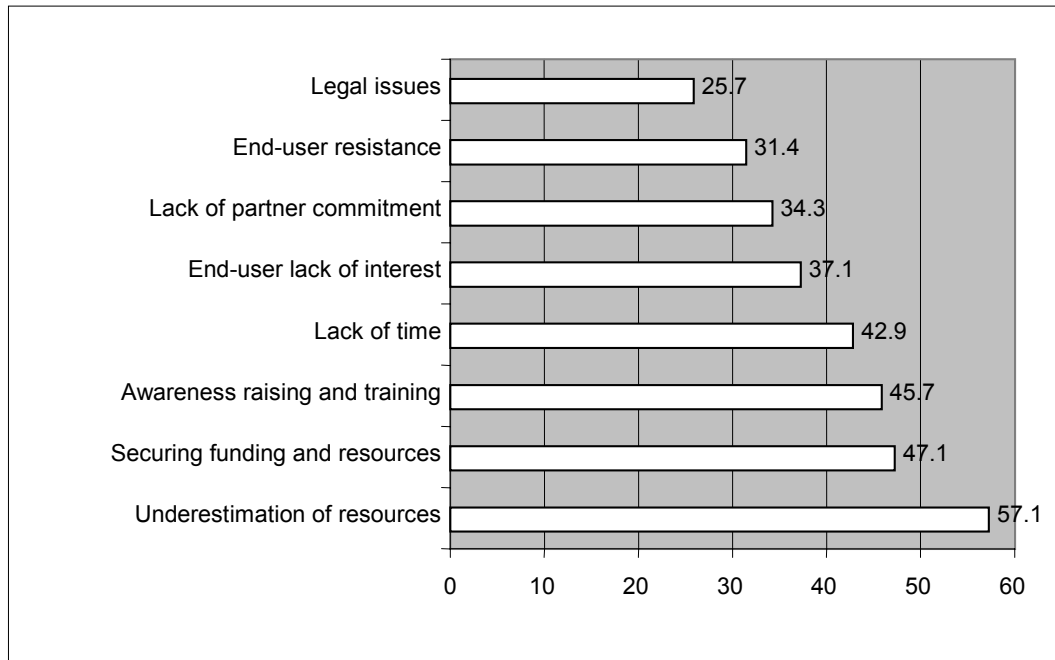
Figure 2: *Percentage of Projects Encountering Problems*

From Figure 2, we can see that the major problems encountered were estimating and securing resources. Also a lack of time to devote to projects was rated the fourth most serious problem. Thus resourcing issues were clearly the most problematic and, understandably, this was most evident in projects where little progress had been made. Also, in many cases, it was evident that there had been a very substantial under-estimation of the effort (at the coalface) required to bring potential end-users (particularly SMEs) on-board and provide them with required levels of ongoing support. For example:

> *I mean a lot of it was done marvellously well. Technically the project management and everything else at the more senior levels of cooperation .... But then once they got down to the point at which they had to bring in the [SMEs] and get buy-in there, that's where the whole thing fell down. ... There's a need for a more independent third party, sitting in the middle, who can put the effort in and almost wear the white coat between the parties. ... There might be industry associations ... [but] they still don't drill down to this stage of going out and doing the hard work and making things happen (Interviews, 2001).*

Preparing information systems so that they could interface with the project infrastructure (particularly database schema consistency) was a problem area mentioned by many interviewees (even though standards issues were not rated much of a problem in survey responses - see Table 3). However, almost all interviewees stated that they had greatly under-estimated the time they would have to devote to their targeted end-users. Not surprisingly then, from Figure 2 again, we can see that end-user change management problems (lack of interest and resistance, and awareness-raising and training) ranked just behind resource issues in terms of difficulties encountered. Some interviewees referred to well-known problems associated with small business:

> *You see, we are all faced with the same problem of trying to supplement and assist these small businesses that ... have enormous cash flow problems, limited capital input ... . They are trying to exist as an individual business, but they need the safety of a collective group of like people, under a banner, that can give them economies of scale (Interviews, 2001).*

A few project participants raised the issue of underpricing or not costing services and the problem that things that were provided for free were not valued and appreciated. As one interviewee noted in hindsight:

> *people's perception of the value of something is clouded by how much they've had to pay for it… . It might have been a harder sell to get people to pay a subscription fee … but we would have picked up people who genuinely wanted to take advantage of what the technology offered (Interviews, 2001).*

Finally, in our survey responses, problems faced in managing consortia relationships were not ranked all that highly (in comparison to the other broad problem categories – see Table 3). However, from Figure 2, we can see that lack of partner commitment and legal issues ranked 6 and 8 (out of a total of 26 problem types) among survey respondents. These are definitely relationship management issues and, while not completely reflected in our survey results, the whole area of effectively forging and managing collaboration was consistently brought up by interviewees as one of *the* most critical success factors for ITOL projects.

5.   Relationship Management

As Paul and Antonio (2001; p.39) have noted, the most prevalent leadership flaw in eBusiness initiatives is a failure to nurture and manage the change that new economy business models create. Inter-organizational collaboration is absolutely intrinsic to eCommerce initiatives and, clearly, one of the strengths of the ITOL program comes from its insistence on projects being implemented by multi-partner alliances or consortia. As the survey results showed, the majority (69%) believed project outcomes were better achieved because of collaboration and sharing of resources. Yet one interviewee (2001) emphasised the *"complex matrix of collaboration"*. Nowhere was this more evident than in the highly-successful South Australian Water Industry Alliance Portal project.
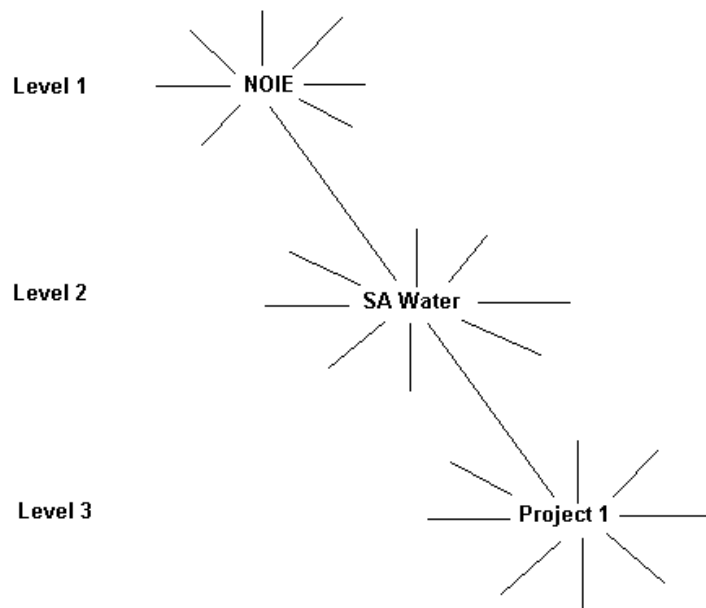

Figure 3: Water Industry alliance structure.

The portal (http://www.waterindustry.com.au) has changed the culture of the water industry in South Australia. Here there is a most interesting mix of government and private sector participants and where (Interview 2001) *"the only way to work was to produce an alliance with an independent broker."* It is claimed that the alliance is *"... the only type in the world — a purely commercial cluster (not individual associations) and not technologically driven" (Interview, 2001).* With 170 financial member companies and a preponderance of SMEs lacking export skills, the alliance has members collaborating and sharing resources and IP and joint bidding for projects. The philosophy of the alliance is *"providing integrated solutions" (Interview, 2001).*

The Water Industry Alliance formed in 1998 includes 170 South Australian based companies and related organizations seeking to develop their export markets, or wishing to form strategic alliances with other water related organizations in Australia and offshore. The Alliance is focussed on networking and dissemination of strategic information on emerging and current business opportunities. Member companies are encouraged to join together in strategic alliance teams to tender for specific projects.

The Water Industry Alliance portal is exceptional in that it was not simply designed for information dissemination; it was specifically aimed at promoting online collaboration. By using the portal as a focal point for reviewing business opportunities and for communicating with each other, the alliance members are able to form business clusters that enhance their competitiveness and ability to offer innovative cost-effective solutions to customers in Australian and overseas. The portal is industry-driven and was identified as a priority need by the alliance members.

Figure 3 shows the various levels of networking and collaboration happening in this project. As the diagram shows, NOIE is the central facilitator (at Level 1) and, in the early stages of the project (grant application preparation and evaluation) is right at the centre of most activity. But later when the grant is approved, NOIE's involvement diminishes and its facilitation role is taken over by the project consortium (or SA Water at Level 2). Finally, when different consortiums are formed and win projects, SA Water's role is reduced to what is essentially, a watching and monitoring brief.

One further point we should note here is that, while effective collaboration at all levels is essential, the role of SA Water in facilitating and maintaining alliances was absolutely critical – and, indeed, in our view this was the single most important critical success factor with respect to this project. Furthermore, their role extended way beyond provision of the portal, the generation of content and signing up alliance members - with one especially important activity being their vigorous promotion of regular, informal, social get-togethers where alliance members could establish ties and friendships not generally feasible in a purely virtual world.

It was clear that in this case the right person was put in charge of the alliance, a project manager who was most effective at building relationships (on-line and face-to-face), establishing a working trust among consortium members, and weaving the fine balance between conflict and consensus. The project revealed the benefits of well-managed networking and relationship-building partnering practices and mindsets rather than a focus purely on transactions. Moreover, there was a real understanding of interdependence, of one organization's fate linking with a myriad of others in co-creating and utilizing opportunities (Conlon and Giovagnoli, 1998). Finally, the project avoided what Davies (2001) has claimed is the major reason alliances fail – that of opportunistic behaviour.

6.   Conclusion

eCommerce is having major impacts on our global social world, with a key influence in the way organizations and governments configure, manage, and run their businesses. Often this requires a change of paradigms, of routines, and challenges to the traditional status quo and power domains. Recognizing the power of the information economy and knowledge as a key ingredient for competitive advantage at a national level, the Australian Government (as have others, such as Singapore) has promoted eCommerce practices through its ITOL financial assistance program. While there have been a number of specific successes as outlined in the paper, perhaps the most overwhelming general success has been in the education of business and the broader community to the notion of eCommerce and the vital competence of effective organizational collaboration - without which new organizational learning and knowledge are harder to achieve. This helps the Government's broader agenda of moving Australia to a position where businesses and consumers alike are well-placed to take maximum advantage of technological advances as they emerge. As such, the catalytic role of the Government in the eCommerce field has proved a crucial one.

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