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Transforming Healthcare in Australia: The PeCC Initiative

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Abstract- **Many of the current crises in contemporary healthcare management centre on issues concerning information management and costs. Electronic commerce (or e-commerce) activity, grounded in the development of the Internet, is challenging traditional management models and providing new paradigms and possible solutions for improved health care management.**

Australia's health industry, like other economic sectors here and globally, is grasping the need to use IT and telecommunications with e-commerce strategies for improved cost-effective services to its key stakeholders. This paper addresses the changes occurring in Australia's health care industry influenced by trends in information systems. While the Federal government's recent report, *From Telehealth to E-Health: The Unstoppable Rise of E-Health* [3], outlines a diverse range of projects and practices, here the authors focus on Australia's first Internet trading community, The Project Electronic Commerce and Communication for Healthcare, otherwise known as PeCC.

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I. INTRODUCTION

This paper outlines the **Project Electronic Commerce and Communication for Healthcare (PeCC)**. Within the multiple projects involved in PeCC, the paper concentrates on the collaborative project implemented as the Pharmaceutical Extranet Gateway (PEG) by seven major wholesalers, competitors operating in the same industry of pharmaceuticals, born with the aid of both governmental and industry midwives.

Initiated in 1997, PeCC emerged from Federal Government concern over burgeoning costs in Australia's $37 billion health sector. This multi-stage project was developed and has received support from a number of Federal government departments, but is a joint activity of both government and industry. PeCC was developed to introduce e-commerce practices into the health sector with almost 700 suppliers, automating pharmaceutical and other supplies to hospitals. Supply chain communication will be facilitated by an Internet-based platform, allowing more efficient interaction between the pharmaceutical industry's outlets (retail and hospital pharmacies), wholesalers, suppliers and manufacturers. Promoting and demonstrating e-commerce for the pharmaceutical industry supply chain, the project will connect manufacturers, wholesalers, suppliers and hospitals. Barcoding every consumable and streamlining the supply chain relating to pharmaceuticals and other healthcare items supplied to hospitals is the basic focus of change in the project. The approach is based on that already utilised for over a decade to increase efficiencies in modern warehousing and retail systems such as databases, barcoding, and having suppliers and customers linked electronically. It is grounded in common numbering systems for products (e.g. European Article Number (EAN)) and in electronic distribution of orders by wholesalers and acknowledgment by manufacturers, using the Internet.

The pharmaceutical industry is one of the first industry groups to have adopted a standardised approach to e-commerce. The project's impact, however, is significant within the broader healthcare industry. As one authority put it: *"The project heralds a global transformation of many aspects of health industry administration, putting barcode scanners into the hands of nurses and even replacing the doctor's hand-scribbled prescription. Every item used in hospitals, from cornflakes to soap, would eventually be covered" [1: p.75]*.

Hart and Saunders [11] have explored the way computer networks are increasingly being used to support the flow of information between and within organisations, and how such usage both influences and has consequences for interorganisational relationships. Tapscott [25] goes further and emphasises that the concept of community is vital for success in the new economy. An emphasis on relationships, both business-to-business and business-to-consumer, is central as organisations learn to coevolve into online business communities or, as he puts it, 'e-business communities'.

II. RESEARCH OBJECTIVES

Use the co-opetition mindset. Think about creating and capturing pie – competing and cooperating [21: p.35].

The goals of this study were to:

- explore innovations in Australia's healthcare management facilitated by information systems (especially e-commerce/Internet developments);
- understand how developments in IT enabled a change from interfirm rivalry alone to interfirm competition and collaboration; and
- extend work done elsewhere internationally in drawing on empirical research in Australia.

Our research was organised around the following general research objectives:

- test some current theories in the area of collaborative relationships;
- have an input into theory development;
- contribute to an improved understanding of the evolution of a particular industry; and
- focus on Australia as the locus of empirical testing.

III. THEORETICAL FOUNDATIONS

The underlying theoretical perspective of this research was that of strategic alliances and competitive collaboration, based on understanding that *"Alliances reshape not only the structure but also the dynamics of competition [9: p.190]."* While collaboration amongst competitors may at first glance seem rather strange, it appears that up to 70% of all interorganisational collaboration – at least in Europe and America, account for just such cooperation [6]. Others emphasise that what we are witnessing is the growth of 'collective competition', that is competition between sets of allied organisations or 'constellations' of interlocking alliances [9]. Nevertheless, the real nature of such collaboration is not always easy to comprehend.

There has been enormous diversity in approaches used to further understanding the rich area of interorganisational relations, cooperation and collaboration, cutting across a range of disciplines and perspectives – economics, politics, sociology, marketing, strategic and general management, and organisation studies, being among the major ones. In the past, there has been a heavy inclination towards the economics perspective. Now, however, there is growing agreement that one needs to move beyond a pure economics approach to understand the much wider variety of goals and purposes alliances may perform. Moreover, one needs to appreciate that certain approaches may not be valid, depending on the type of alliance under investigation. Indeed, diverse approaches offer the best solution to many of the difficult questions facing researchers and practitioners today. In this study we utilise the organisation studies and strategic management perspectives.

IV. RESEARCH METHODOLOGY

Our approach was that of a qualitative inductive case study with an emphasis on theory generation – propositions – rather than a sole focus on testing pre-existing theory [7, 26]. Case study methodology [26], while still not as widely accepted as other more traditional approaches, is increasingly recognised for its capacity to yield rich, dense, data and to contribute to theory building.

The research also follows Glaser and Strauss' [8] approach in developing 'grounded theory' that allows theory to emerge from the data. Furthermore, we adopted an interorganisational rather than dyadic perspective, stressing the alliance per se, instead of individual players and their particular relationships. This level was considered primary, although, much as Price [23] has argued, the organisational and environmental levels were also encompassed.

Data collection was guided by theoretical preparation and literature reviews. Specific tools adopted to ensure triangulation [26] in our approach, included the following:

- primary and secondary sources of information – minutes, contracts, policy documents, reports, publications, press, journals, academic and professional literature;
- minimally and semi-structured interviews with key stakeholders involved with PeCC and public sector agencies playing a key role (e.g. with senior executives, alliance managers, site managers, association representatives, etc.);
- participant observation such as attendance at meetings;
- linkage documentation and analysis using Netmap software (computerised recording and analysis of relationship links); and
- findings from previous related research [19].

V. PeCC: AUSTRALIA'S FIRST INTERNET TRADING COMMUNITY

> *PECC is the first project of its type in Australia where an entire industry supply chain is being revamped to take advantage of the Internet and web-based technologies. It promises to create major savings to all the participants in the supply chain, particularly the publicly funded hospitals [18: p.5].*

A critical problem that needs to be overcome is the increasing cost of providing healthcare to an ageing population, a problem common to most global healthcare models. Australia's current three-tier hospital system structure and its IT incompatibility problems has ensured that finding the real cost of the healthcare industry is an almost impossible task, as is the allied one of pinpointing wastage in the system. Improving supply chain management (SCM) by introducing IT dimensions of Global Numbering Standards (e.g. EAN), barcoding, and e-commerce for tracking supplies from manufacture to point of consumption, was envisaged as providing a solution and ensuring *"the right item is in the right place, at the right time, in the most cost effective manner [22: p.3]."*

PeCC is one of the leading edge innovative examples of Australian Internet commerce. This business-to-business e-commerce project has been driven by initiatives from both government agencies and industry partners. PeCC reform of the health sector supply chain commenced with the private sector (pharmaceutical companies and private hospitals) but is now spreading to public hospitals. It initially targeted pharmaceuticals but has extended to incorporate a wider range of products.

PeCC was designed to:

- accelerate the uptake of Electronic Commerce, Internet connectivity and the use of the EAN standard numbering system in the health sector manufacturing, professional community care and distribution environment; and

- demonstrate supply chain improvements that will become best practice for the management of product, inventory and allied services in the healthcare system [22: p.3].

PeCC follows closely the supermarket model of barcoding and scanning. In the pharmaceutical industry, distributors and manufacturers are encouraged to adopt common numbering and information exchange standards, as well as to use the Internet for e-commerce practices to distribute orders by wholesalers and to receive acknowledgments from manufacturers. Eventually the supply chain will be extended to include end-users (i.e., hospitals) which will allow pharmaceuticals to be optimally scanned by the bedside on consumption. Once PeCC is fully implemented and with industry products compatible, it is anticipated that those products not complying with the EAN barcoding system and e-commerce/Internet solutions will be excluded from purchasing panels and electronic catalogues.

PeCC itself consists of: a Council that provides policy direction for the project and meets three to four times a year; an Executive Steering Committee that decides on budget allocations, provides guidance to the project director and meets six times a year; a Project Director; Financial Stakeholders, including all PeCC council members and all other organisations that have provided financial support to PeCC; Industry Sponsors, those organisations that have contributed financially but are not actively involved in any project; and Advisers. Of the $1 million PeCC budget, 60% has been provided by government agencies and the rest by industry sponsors and project participants.

If successful, PeCC will be Australia's first industry wide Internet trading community. It will have achieved an open standards system allowing anyone to communicate with anyone else, instead of the traditional closed, proprietary networks dominated by IT-strong organisations. Moreover, uniformity across the pharmaceutical industry sector will be facilitated through PeCC. Additional benefits identified include more complete and readily available medical records for individual patients, better understanding of the costs of providing patient care inside hospitals, and improvements in other hospital systems such as patient billing.

PeCC undertook a number of demonstration projects to show the viability of adopting common numbering and information exchange standards as well as using the Internet for electronic trading in the pharmaceutical industry. Figure 1 is a Netmap showing the complexity of linkages within the healthcare supply chain matrix and the positioning of the *Pharmaceutical Extranet Gateway (PEG)* within the supply chain.

A. The Pharmaceutical Extranet Gateway (PEG)

Here we focus on the most successful of the projects, the setting up of **PEG**, under PeCC's **Trading Partners Program (TPP),** now a major component of the overall project and a building block in establishing trading documents for the healthcare market.

PeCC's initial focus was to link five major competitive pharmaceutical wholesalers (Australian Pharmaceutical Industries, Faulding Healthcare, Hospital Supplies of Australia, Sigma Company, and W.H. Soul Pattinson & Co), and the 700 manufacturers from whom they purchase. The CEOs of the five major wholesalers agreed on a handshake and then negotiated buy-in from their Boards for collaboration on developing a common Internet based EDI/EC platform, which would allow them to trade electronically with their suppliers at reduced costs [12]. The partnership that developed has culminated in the five wholesalers collaborating to use standard electronic order forms through PEG. This network has just recently expanded to include wholesale distributors Clifford Hallam Pharmaceuticals P/L and LJ Cottman (WA) P/L.

As illustrated in Figure 1, PEG provides a single common electronic ordering system that allows pharmaceutical wholesalers and suppliers to transact business through the Internet with the use of a common EAN-based bar coding or standardised numbering system. It enables wholesalers and suppliers to send purchase orders and to receive responses across the Internet rather than using the more expensive EDI option. EDI represents an alternative solution but, while satisfactory to large organisations able to invest in technology and skills required for the system, this is not a solution for smaller companies. The newer solution, as offered by PEG, is a single common electronic ordering system without much implementation time and minimum cost because of Internet utilisation. The wholesalers are subsidising the program by committing to the bulk of the development cost and paying for the operation of the central facility.

Sterling Commerce (which has worked extensively with US and Australian pharmaceutical companies) won the tender for developing the e-commerce platform for the PeCC Trading Partners Program. Sterling is providing software (a suite of solutions for Internet trading called 'netCommerce') and services for PEG, and the service and technical expertise to connect wholesalers and suppliers to the PEG Bureau, PEG's central processing facility in the Internet. Sterling has chosen Telstra's Big Pond as the preferred Internet Service Provider (ISP), (with Ozemail as second ISP) and Hewlett-Packard providing the hardware. Datworks P/L serves as PEG marketing and integration specialist adviser. Alliance members all signed individual contracts with Sterling Commerce, with specific mention that no system changes could be made without the agreement of all PEG members.

Suppliers to the major wholesalers are generally small manufacturing companies with sales of up to $4mill annually and between 20-30 staff. Such organisations will be provided with the requisite Internet application software, connectivity, and help-desk support for approximately $50-150 per month. Those already with such facilities would pay an annual

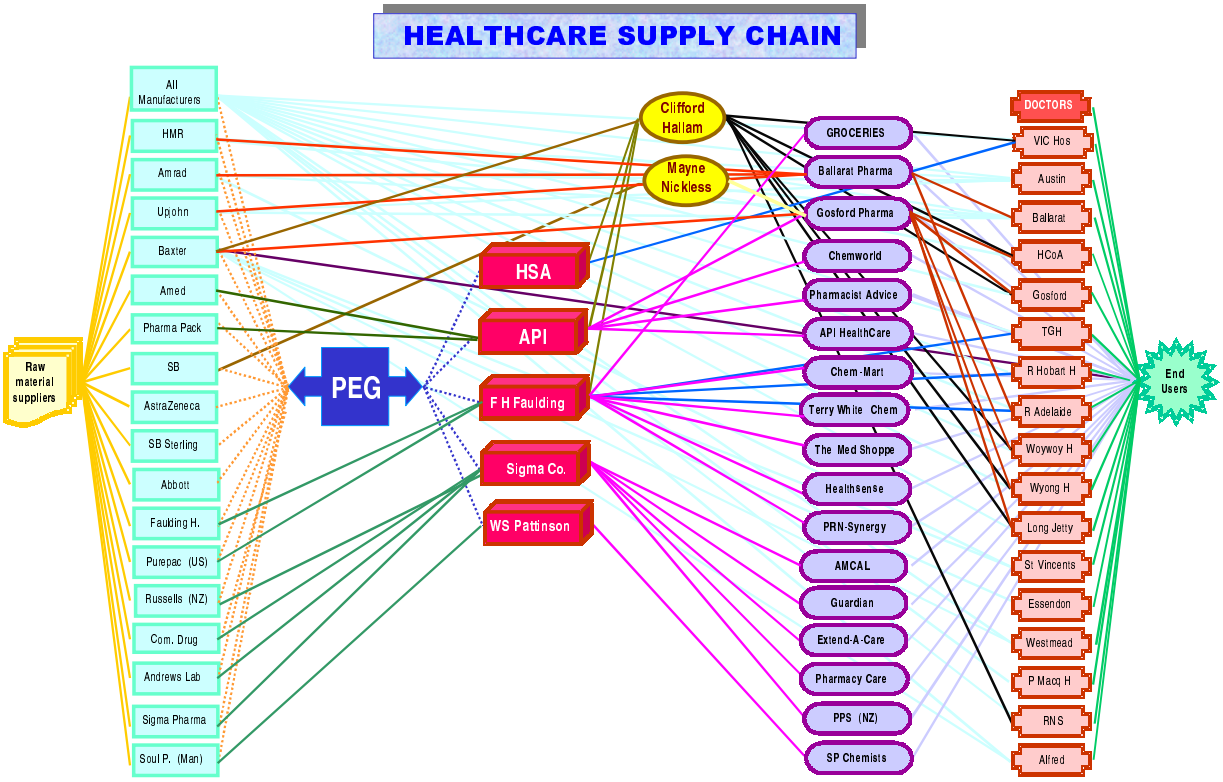

Fig. 1. The PeCC healthcare supply chain.

fee for document transmission of between $600-2200, depending on how many documents are processed [17].

PEG is the most successful of the array of PeCC projects so far. It is aimed at overcoming problems of disparate databases and the current inefficiencies related to supply chain ordering via fax. These inefficiencies include re-keying orders, lack of confirmation of orders, multiple transmissions, delays and cost factors. PEG involves six EDI-forms, also in flat file and electronic web browser format. Consequently, it offers accuracy in processing, advanced delivery notification, streamlined payments, and accurate and timely shared business information. It provides a network linking the major wholesalers to manufacturers and suppliers for purchase orders, acknowledgments and payments. Ensuring secure encryption, documents can be tracked through the system. Analysts estimate that the cost of placing an order through the normal manual process would be around $50 to $70, and with full implementation of PEG, this transaction cost will be reduced to a mere $2-5 per order.

PEG standards will be used to send orders by hospitals and pharmacies over the Internet; prescriptions may be sent; and PeCC standards will permit pharmacists and doctors to be paid by the government electronically. PEG allows for replacement of traditional fax transmission ordering. In reality: *"It is a single, common electronic ordering system for all wholesalers and suppliers. Small to medium enterprises can trade with their largest wholesale customers without the expensive EDI price tag or a lengthy implementation period [14: p.2]."*

PEG's formation and implementation, during 1998-99, is leading edge global practice, allowing a group of companies to use the Internet for exchanging messages, correspondence, and product turnover ordering with approximately 700 potential trading partners. By the end of 1999, the project aims to have at least 400 of the 700 manufacturers companies trading electronically. Furthermore, the project will enable e-trading between the PEG trading platform and transportation and logistics companies, an Australian first, pointing to the ability to track freight 'across docks'. The anticipated project completion date is end-July 2000, with wholesalers and suppliers connected and able to electronically trade the complete range of supply chain documents.

VI. OBSERVATIONS AND ANALYSES

Clearly if the central focus of PeCC - to reduce waste in the health industry by improving SCM - is achieved, this will be its major advantage. Savings of $340 million annually [24] or more are predicted. Some specific benefits include:

- reduction in transition time from order placement to delivery and payment;
- reduction in costs of overall procurement (orders reduced from $50-70 to $2-5);
- comprehensive information on exact stock movements;

- establishing a foundation for a just-in-time ordering system;
- better matching of demand and supply by manufacturers and suppliers;
- greater accuracy and efficiency;
- error-free receipt of orders and integration with order entry systems by eliminating re-keying time and errors;
- rationalising of other trading documents, such as turnover orders and possibly electronic invoicing and payment instructions to financial institutions;
- improved service to customers (leading to faster payment for suppliers);
- improved inventory management and accountability within the hospital sector;
- increased efficiencies in hospitals and reduced shrinkage allowing funds to be better focussed on actual patient care;
- less reliance on proprietary IT systems;
- a major move towards standardisation opening the way for much greater interoperability;
- the ability to realise electronic commerce benefits without a massive investment in it; and
- the capability to more effectively utilise customer usage and ordering patterns information.

From our research it is clear that in its relative short history PeCC has:

- set the agenda for improving supply chain management in the health sector;
- persuaded the major pharmaceutical wholesalers to use EAN numbering and barcoding in their supply network and to use an Internet-based 'any to any' common e-commerce platform;
- produced guidelines for barcoding in the healthcare sector;
- provided an array of publications for wide dissemination, to influential parties and existing and potential PeCC stakeholders;
- developed pilot/demonstration projects [5];
- assisted with the re-engineering of hospital supply chains to e-business solutions;
- obtained agreement amongst most key stakeholders to common standards;
- established a common Internet-based gateway;
- worked towards establishing EAN as a standard for products;
- set agendas and raised awareness of critical ways of improving the healthcare sector; and
- obtained industry buy-in through in-kind and financial contributions.

Yet, from its inception, PeCC has had to contend with difficulties relating to the broad issue of change management in a fairly traditional and conservative industry. For example, resistance from those averse to technological development; concern from the manufacturing sector about waste and theft being reduced and leading to sales of fewer products; suppliers not wishing to alter culture and practice; some wholesalers also developing their own online systems connecting directly to customers; and difficulties within and across different levels of government relationships. Furthermore, there is concern over the pace and depth of change, especially given *"the entrenched, regimented views of some (Interviews, 1999)."* Many see it as too fast and radical, while those passionately committed perceive it as far too slow!

Finally, however, there is one overarching difficulty and challenge for the future that emerges from the data. This is that much of PeCC's work and projects are perceived in terms of IT rather than from a business strategy viewpoint. Consequently, from a broader perspective the real challenge in terms of PeCC projects, is the complex one of ensuring appropriate change management in the industry. This incorporates the real need for attitudinal and behavioural change in the sector, including e-commerce being regarded as a critical first tier strategic issue by senior executives and boards. As one executive we interviewed commented: *"Technically, the [PEG] system is complete and implemented …. What is needed now is awareness creation [of its strategic potential] in the organisations themselves. (Interviews, 1999)."*

VII. RESEARCH FINDINGS

> *Our industry is breaking new ground in the drive for greater efficiency because it is the first time competitive companies in one area have put themselves together. (David Murphy, CEO Faulding Healthcare – in [20]).*

It has been asserted that *"PeCC is trailblazing and pace-setting … Majors collaborate with different agendas and egos (Interviews, 1999)."* Or that *"Collaboration exists because it makes sense for competitive reasons (Interviews, 1999)."* Certainly there are many levels of collaboration evident in the PeCC Project, from its beginnings to the present time, involving Federal and State Governments and their affiliated bodies; industry bodies and industry associations; commercial organisations; plus international entities.

In terms of competitive collaboration, PeCC's facilitation of agreement amongst the initial seven major pharmaceutical wholesalers in the PEG project stands out. It is a competitive alliance producing a new process – a new way of doing business – that can be learnt and distributed as both a private and common good among the alliance participants who are simultaneously PEG collaborators and competitors in the pharmaceutical markets. Interestingly the emphasis is to a large extent about learning with each other, not just learning from each other as is the case, for example, in many joint venture partnerships [16]. Here, there is clearly some information sharing occurring in terms of common and collective benefits, organisations working together because there is a clear advantage to so do: *"Core things – no*

problems working with them and no disadvantage because we focus on the process of ordering more effectively and efficiently …. Cooperation … without it we won't achieve because it is necessary to cooperate to form consensus views on many things (Interviews, 1999)."

Certainly, there were political motivation and agendas in the broad background to the PeCC alliances, as has been illustrated earlier, both in the historical overview that clearly highlights political stakeholders, and in the ongoing management of the project. Yet, in many ways this alliance is clearly also both a learning and business arrangement – learning from each other in partnership about a new way of organising and doing business, and also establishing a more competitive position in the marketplace; and motivated by exploring innovation, learning and internalisation of new skills [5, 15]. Clearly also, the strong positions of the participants within the industry, accompanied by high status, credibility, and reputation, was a useful magnet to draw them together.

As an alliance built on technological innovations, opportunities, and agendas, the very technology motivating collaboration also enables that collaboration and the interaction patterns and structural dimensions of the arrangement. In the sense of a cooperative alliance, PEG can be viewed in terms of a 'network', given its definition as *"a particular organizational form which is characterized by a high sense of mutual interest, active participation by all partners, and open communications [2: p.38]."*

Competition, however, is alive and well amongst the seven in the cut-throat pharmaceutical wholesaling market. Moreover, some (Interviews, 1999) suggest:

> *PEG is running far short on competitive collaboration. Trying to tackle the problem of getting lots of suppliers and reducing costs is as far as they are prepared to cooperate. But a lot are keeping strategies to themselves and have cordoned off that area of cooperation … A lot of intelligence is not being shared … use PEG to help individuals and then compete in their own area.*

Furthermore, while there is competition in the retail pharmaceuticals market, there is growing competition for the hospital market. Others emphasised that *"The issue of competition is so strong between the States and Feds plus problems in Health with its own set of dynamics – they don't understand the nature of competitive collaboration (Interviews, 1999)."*

Some see that PeCC has reached a critical point. It is currently in its implementation phase and, in 2000, when government involvement ends and a new coordinating body is established, current relationships, roles, responsibilities and coordination mechanisms are likely to be revisited.

Aside from the competitive collaboration issues in relation to PEG, it is clear that such issues, in a different sense, exist elsewhere in terms of PeCC overall. For example:

- Competition and collaboration between the States themselves;
- Competition and collaboration in the States among different hospitals;
- Competition between States and Federal Governments;
- Competition and collaboration in government within Departments and between Departments; and
- Competition between the private and public sectors.

Alternatively, it has been suggested that, while the private sector is increasingly prepared to do business through strategic alliances, the public sector has far less capacity to understand such relationships and little competence in doing them effectively (Interviews, 1999). In addition, there is some suggestion that a system that works overseas, or in the Australian private health sector, may not be adopted by the public because the Australian system is considered different and the private hospital system is "*treated with disdain*" (Interviews, 1999).

Consequently, for the present study, the research outcomes broadly encompassed:

- Confirming and falsifying some current theories;
- Introducing some new dimensions;
- Better clarifying some of the issues in industry development;
- Outlining a useful case study of e-commerce in an Australian industry; and
- Gathering additional insights from the rich data that may feed into the exciting theory building occurring in the field.

In terms of confirming current theories, the case affirms, in particular, much in the change management literature relating to the pivotal role of leadership (both individual and organisational – as evidenced by the PeCC project manager and Soul Pattinson); government support (NOIE's role); resistance to change (embedded in political, power and economic agendas); and the significance of strategic alliances and networks.

The importance of communication in both the broader change agenda and collaboration within it, also clearly emerged. For example, we find the approach of 'carpet-bombing' stakeholders with information increasingly irritating stakeholders who ask for concise information and knowledge rather than copious and random data. Changing this could improve relationships and extend understanding as well as enhancing PeCC's credibility in the sector. Moreover, the nature of the communication is also important as is indicated in attitudes to an apparent informality of meetings, initially resisted and then welcomed.

From the perspective of falsification, Gomes-Casseres [9] and Doz and Hamel [5] suggest that dominant leading firms

are not keen to cooperate with like firms in their industry. This obviously was not the case with PeCC where we see the five, then seven, major wholesalers collaborating in the equal partner network of the PEG project, where no dominant participant sets up and controls the network [2]. Indeed, what we find is illustrative of what Child and Faulkner [2: p.119] define as dynamic networks, *" … composed of lead firms who identify new opportunities and then assemble a network of complementary firms with the assets and capabilities to provide the business system to meet the identified market needs."*

One interesting facet to emerge relates to just how the many tensions and contradictions in alliances actually are managed – in our case study, aside from competition and collaboration, there is the issue of learning as individual organisations from competitors versus learning as allied organisations in collaboration. The newer dimension appears to be the focus on learning *with* (as a group) – indeed the collaboration was essentially written in such terms - rather than the more usual emphasis on learning *from*. Of course, it is important to look more longitudinally at vital aspects such as learning and trust here in order to understand how this develops and alters over time.

For example, risks, as well as benefits, are associated with data gathering and access to information in PEG. This is illustrated in the causal loop diagram presented in Figure 2. Essentially, the issues here are data sharing versus privacy and the PEG partners' collective risk-taking propensity. The less conservative an organisation is, the more inclined it will be to risk sharing data with its partners. A high IT capability also reduces data sharing risks. The more that data is shared, the more use can be made of it (info. utility). If an organisation is effective in utilising the total data set relative to its competitors, benefits will follow and it will become less conservative (regarding data sharing). Conversely, losses will result and this may reduce the organisation's propensity for risk-taking. In either case, the organisation will learn and this will improve its IT capability.

The question the partners must face is: should they continue with the current system (albeit, in automated form), where they only have access to their own transaction data or should they allow each other to access the complete data set? If they opt for the latter course, they will be in an excellent position to use information for true strategic advantage: essentially, because each partner will now have access to information on the total business domain and not just their portion of it. Obviously, however, the risks here are high. So, effectively, those partners that favour data sharing will be backing their own organisation's IT capability against that of their collaborators/competitors. This, in our view, is one of the more fascinating matters still to be resolved among the PEG partners and goes way beyond basic, operational-level concerns with data privacy and security (important though these are).

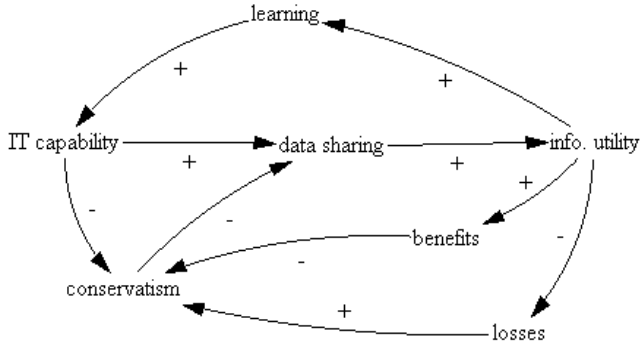

Fig. 2. Data sharing, risk-taking and learning.

While what has been explored in this work is seen by many as pivotal to health industry development, what emerges is that this is not a view equally shared by all the key stakeholders. Not perceiving the strategic dimensions of what are essentially the goals of PeCC, relegating them way down in the ranking of major organisational concerns, or merely seeing e-commerce in technical terms, is a major difficulty. So too is the apparent often dysfunctional competition or conflict between key stakeholders, for example, that between government and industry; within and across State and Federal government; and within industry itself.

So our emphasis keeps returning to the broad theoretical perspectives of organisation/management theory and strategic management as informing much of what has been said in this work. The current developments in e-commerce will continue to challenge these theoretical views, testing traditional assumptions about the very nature of organising and organisation, management, leadership, collaboration and competition on a global scale.

While it is clear that in the PEG alliance major objectives were met, in terms of the depth of skill improvement and knowledge acquisition, longer term research would also permit better evaluation of collaboration and performance than is at present possible. This would provide a more reliable basis for developing propositions and theory from the case. For example, the following tentative propositions certainly seem to merit further investigation:

- Constraining alliance scope, through the precise specification of the range of allowable activities, may well diminish the importance of *trust* as an alliance critical success factor (e.g. PEG within PeCC).
- A well-defined alliance scope, may encourage partnerships where participants are more inclined to learn with (rather than from) each other.
- Benefits from alliance participation may be: commensurate with inputs; and a function of motivation for entering the alliance in the first place. With PEG, our observations were that those best placed to take maximum advantage of the collaborative arrangement are the participants most active at the operational level. Interestingly, a number of participants seemed to be

motivated more by defensive considerations than by any real belief in the project and its objectives.

VIII. CONCLUSION

I come not to bury those alliances, but to praise them. But if, and only if, the alliance is based on an unambiguous, collaborative 'fit' between the demands of a focussed strategy and specific value-added talents that the partners openly bring to the table. The goal is not to camouflage individual deficiencies but to marry one's unique strengths with someone else's unique strengths in order to carry out a concrete, well-crafted joint mission. That's what separates the pseudo-partnerships and sham alliances from the legitimate ones [10: p.54].

Certainly in the PeCC case study we are witnessing a range of legitimate alliances, demonstrating excellent fit and based on complementary strengths and united goals. What this represents is an alliance and e-commerce revolution that will not only change industry players but the very way in which that industry itself is organised [9].

Finally, this paper has attempted to bridge the divide so often evident between theory and practice and has tried to answer the call (eg. [13]) for case studies that move beyond outlining the decision to enter into partnership and into describing alliance development. It has done so by exploring an evolving alliance in the dynamic, new high technology area of e-commerce that challenges traditional ways of organising and managing, individually and in relationships, competitively and collaboratively. We have been fortunate in being able to explore under the PeCC umbrella a number of bold initiatives and collaborative projects, particularly that of PEG, that will reinvent the Australian healthcare industry.

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