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Abstract

Organisational and national cultures have been extensively studied in information systems. In this paper, we introduce and argue that the concept of industry culture has a strong influence in the adoption of an inter-organisational information system (IOIS). Data was collected from eight organisations in three industries which showed that industry culture rather than organisational culture has a greater influence in the adoption of an IOIS. In all cases, The practice component of the industry culture was examined. In the retail sector of a Fast Moving Consumer Goods industry, organisations prepared to change their culture to achieve shared IOIS adoption benefits such as sharing data across organisations. Industry culture was however shown to be an inhibitor to IOIS adoption in the foodservice industry. In the healthcare industry, customers (hospitals) were prepared to change their practices to adopt an IOIS whilst some suppliers were reluctant to change because they would lose their benefits and power they once held.

Keywords

Organisational (organizational) Culture, National Culture, Industry Culture, Adoption, Inter-Organisational (Inter-Organizational) Information System (IOIS)

Introduction

Organisational and national cultures have been extensively studied in information systems (IS) (see Leidner and Kayworth 2006) and scholars have examined organisational culture and national culture when comparing the adoption of systems from different cultures (see Bunker 2001; Wu 2005). In this paper, we look at industry culture as a way of understanding the inter-organisational information system (IOIS) adoption process. An IOIS is defined as an information system shared by two or more companies.

We argue that organisational culture is dominant when an organisation adopts an intra-organisational IS/IT. On the other hand, industry culture is more influential in an inter-organisational domain as organisations have to deal with their partners in the same industry. Issues such as bar-coding standards, EDI standards etc. are important in the adoption of an IOIS and have to be resolved at the industry level.

The study of industry culture is not new but it has not been widely studied. Literature which addresses industry culture in the discipline of information system (IS) is scarce but industry culture has been addressed in other disciplines (see Pizam et al., 1997). This research gap (in IS) becomes noticeable through our data collection when we examine collaborative processes in the adoption of an IOIS in a supply chain network.

Within this study, an exploratory approach was utilised and semi-structured interview questions were used as the means for data collection. Interviewees were asked about issues regarding organisational culture but they mentioned and focused on industry culture as the factor which had more influence in the adoption of an IOIS. After the first two interviews, it was realised that industry culture was important in the adoption of an IOIS. For the remaining interviews, questions were then focused on both organisational and industry culture.

In this paper, we have developed this focus on the cultural aspects from a previous study of IOIS adoption (Pang 2005). We acknowledge that there are well defined factors already identified in past studies of IOIS adoption process, but that cultural factors, specifically industry culture, should be added to future studies of IOIS adoption. Previously identified adoption factors have been listed in Appendix 1 (see pp. 9-10). When data was collected from eight organisations in three industries, it showed that industry culture is a key external environmental adoption factor. Organisations in the supermarket retail sector of a FMCG (Fast Moving Consumer Goods) industry were prepared to adopt an IOIS and so changed their industry culture, namely values and practices, to achieve shared benefits. For the non-adopting organisations in the foodservice industry, industry cultural change is still long way off as they do not see changing their practices will bring any benefit for

them. Some organisations in the healthcare industry were prepared to change their practices and bring benefit to their industry but others would not because they would lose their benefits and power that they held.

This paper is arranged in the following order. We first review the literature on culture and propose our research question. The research methodology and data collection are then addressed and are followed by a section on results and discussion of the study. The paper ends with some conclusions, and discussion on limitations and areas of future study.

Literature Review

In this paper, we use cultural theory to examine and explain the phenomena of culture in the adoption of an IOIS. Cultural theory has been used "to explain an extensive range of social behaviours and outcomes in organizational settings, firm performance, corporate strategy, job attitudes, administrative practices, merger and acquisition outcomes, technology transfer practices, and conflict resolution strategies in product innovation settings" (Leidner and Kayworth 2006, p.388).

Culture can be explained in terms of *values* and *practices* (Karahanna et al. 2005; Hofstede et al. 1990; Bunker et al. 2007). *Values* are the "relationship among abstract categories that are characterized by strong affective components and imply a preference for a certain type of action… a value is an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence." (Karahanna et al. 2005, p.5). Furthermore, "once a value is learned, it becomes integrated into an organized system of values where each value has a relative priority." (Karahanna et al. 2005, p.5). *Practices* "are learned through socialization at the workplace after an individual's values are firmly in place … [and provide] with learned ways of doing things, such as facts about the world, how it works, and cause-effect relationships" (Karahanna et al. 2005, p.6).

Leidner and Kayworth (2006) have examined organisational and national cultures in the development of a Theory of Information Technology (IT) Culture Conflict. They use a meta-analysis approach to analyse 82 reviewed articles from 38 journals. Based of their meta-analysis, Leidner and Kayworth (2006) further classify cultures in IT into six themes: culture and IS development; culture, IT adoption and diffusion; culture, IT management and strategy; IT's influence on culture; and IT culture. In our research, we focus on the two key themes, namely IT development, adoption, use and outcome; and IT Management and Strategy. These two key themes are shown to be influenced by national and organisational culture.

Apart from organisational and national cultures, we argue that there are other cultures that influence the adoption of an IOIS. The ellipse shown in Figure 1 represents different kinds of culture compiled by Karahanna et al. (2005); industry culture is purposely added as a focus to this study. An individual, shown in Figure 1, learns and experiences different kinds of culture throughout his/her life (Karahanna et al. 2005). The cultures presented in Figure 1 are supranational, national, professional, industry, organisational, group and individual. The definition for these cultures (apart from industry culture) defined by Karahanna et al. (2005) can be found in Appendix 2.
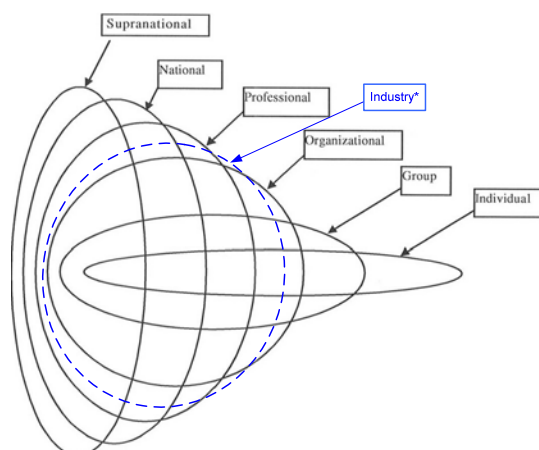

Figure 1: Inter-related levels of culture (source: Karahanna et al. 2005, p.6, with the addition of Industry*)

Different cultures are expected to dominate an individual in different situations. An individual is more influenced and dominated by professional, organisational and group cultures when completing a task (Karahanna et al. 2005). As for multinational organisations, the organisational culture encountered by an

individual can span and include national, religious, ethnic, regional, linguistic and professional cultures (Karahanna et al. 2005).

In this paper, we focus on organisational culture and industry culture because we believe that in an inter-organisational domain, these two cultures have profound influence in the adoption of an IOIS. We first argue that an individual in an organisation is influenced by organisational culture. The organisational culture might drive or inhibit the individuals within an organisation to pursue the adoption of an IOIS. On the other hand, the individuals in an organisation might realise that they have to change their organisational culture if they are going to adopt an IOIS and become more competitive. For instance, their department data will be accessed directly by other departments in the organisation instead which does not support a closed culture.

We argue that industry culture is evolved from an industry, and is specific and unique for that industry. We further argue that for an organisation within an industry to adopt an IOIS for their supply chain network, the industry culture as well as characteristics of that industry, must also have some influence in their adoption process.

We will now address organisational and industry cultures and outline our research question that focused on these cultures.

Organisational Culture

Firstly, we address organisation culture. A major cause of system development failures is linked to a "culture gap" between IT and business within an organisation (Taylor-Cumming 1998). Organisational culture can be a barrier for innovation adoption in an organisation as noted by Serour and Henderson-Sellers (2002, p.78): "while most managers tend to support new technologies, many of them turn away when they realize how much that technology is likely to change their traditional organizational culture". Hence, organisational culture has an influence in the adoption of technology.

In this paper, organisational culture is defined as, "[a] set of shared, taken-for-granted implicit assumptions that a group holds and that determines how it perceives, thinks about, and reacts to its various environments" (Schein 1985, cited in Leidner 2003, p.510). Organisational culture is predetermined by nationality and industry cultures, and tasks (Hofstede et al. 1990). Organisational culture is not established, formed nor developed, however, it emerges "from long-established practices, procedures, structures and systems" (Love and Gunasekaran 1997; Bunker 2001). Hence, organisational culture is established overtime by employees within an organisation.

Organisational culture has been measured quantitatively: Organisational Culture Profiles have been designed to examine cultures, and profile elements include: innovative; stable; respecting of people; outcome oriented; detail oriented; team oriented; and aggressive (Chatman and Jehn 1994). Hofstede et al. (1990) examine organisational culture from six dimensions: process-oriented vs. results-oriented; employee-oriented vs. job-oriented; parochial vs. professional; open systems vs. closed system; loose vs. tight control; and normative vs. pragmatic. This paper does not examine each of the elements or dimensions in detail, but instead looks for overall perceptions of culture by the organisations under study.

When building an IOIS, it is hoped that constant communication between the management and employees, and employees' involvement in business process redesign will help them to change their perception of information sharing, trust with other organisations and, most important of all, the adoption of new business processes (Hammer 2001). Most organisations have functional management hierarchies; managers and employees are delegated to functional tasks and responsibilities, which are impacted by other departments over which they have no control (Barratt 2004). To overcome this issue, an effective way for structural change to occur is to form employees into teams (Love and Gunasekaran 1997). Some conflicts between the teams, and between the management and the employees, are expected, however, these conflicts must be managed and resolved including by removing an employee who does not fit the organisation (Drucker 1985). As for the adoption of an IOIS, there may be issues and problems related to clashes of executive personalities and incompatibility of organisation *cultures* and *values* (Kumar and van Diesel 1996).

Industry Culture

We have added industry culture to Karahanna et al.'s (2005) inter-related levels of culture framework (see Figure 1) between Organisational and Professional cultures. It has been argued that organisational culture is evolved from industry culture (Gordon 2001; Christensen and Gordon 1999; Hofstede et al. 1990). In turn, the industry culture evolves from (a) the industry environment and characteristics such as customer requirements, competitive environment and societal expectations, and "right things to do" in that industry; (b) strategies, structure and business process developed by management of organisations in that industry; and (c) the outcomes

of demand for performance and survival in that industry (Gordon 2001). Organisations within the same industry expect to share similar norms and values (Fombrun 1986).

Chatman and Jehn (1994) investigate the relationship between two industry characteristics, namely technology and growth, and organisational culture in four industries. The organisational culture is found to vary more across industries than within them (Chatman and Jehn 1994). Hence, organisations in the same industry share similar cultural *values* and *practices* (Christensen and Gordon 1999).

On the other hand, culture between industries is found to be different (Philips 1994; Chatman and Jehn 1994). For instance, Philips (1994) found in her study that the working relationship in museums leans towards "team", "teamwork", and "team effort" whereas it is hierarchical in the winery industry with the belief that "the position in the hierarchy is an indicator of experienced-based expertise". Clark (1997) uses the collapse of Barings as an example that links the behaviour of an individual, in this case trader Nick Leesons, to the industry culture and the scope of regulation as well as the management of Barings. Relationships are important elements in the finance industry since information and knowledge of the economy are communicated and shared between firms but Leesons "bet against the functional efficacy of relationship in the market" and paid the price for it (Clark 1997).

Values are affected by practices from our youth but it has been argued that later on in life, *practices* do not influence *values*; *practices* can still be evolved as we experience and learn new routines throughout our lives (Karahanna et al. 2005). However, this line of reasoning does not always hold as it has been demonstrated by Hofstede (1991 cf. Karahanna et al. 2005) that Americans work as a team to develop software which contradicts the national cultural value of individualism. Hence, the composition of *values* and *practices* are different at various levels of culture (see Figure 1): "*values* are more important than *practices* in the higher level cultures (i.e. supranational), and *practices* are norms that dominate for the lower level cultures (i.e. group)" (Karahanna et al. 2005, p.7). The current observation of *values* and *practices* is summarised as "an individual's *values* are predominantly influenced by supranational (e.g., ethnic or religious) and national levels of culture. An individual's *practices*, on the other hand, would be influenced primarily by professional and organizational cultures" (Karahanna et al. 2005, p.7).

As for industry culture, we argue that the individuals (managers and employees) are influenced by *practices* rather than *values* due to the closer relationship of the way they work and do businesses. Culture is not static and could change over time; for instance, if an organisation sees the benefits of adopting an IOIS with their partners, then they might change their traditional *practices* in order to achieve their objectives. Hence, we argue a change to the traditional *practices* by individuals in an industry will result in a change to that industry culture. Alternatively, industry culture could be an inhibitor in the adoption process because individuals might not want to change their *practices*.

This leads us to ask the research question examined by this study: ***How do organisational and industry cultures influence the adoption of an IOIS between organisations?***

Research Methodology

To address this research question, we adopted an exploratory approach as it allows us flexibility and adaptability to change (Yin 2003). A case study research approach and semi-structured interviews were used as the means to obtain data. Case study research helps to understand "complex and ubiquitous interactions among organizations, technologies and people" (Orlikowski and Baroudi 1991). The scope of a case study is defined as, "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when boundaries between phenomenon and context are not clearly evident" (Yin 2003, p.13).

Interviews were considered as the best technique for gathering information for this study (Yin 2003). Conducting semi-structured interviews allowed for clarification and for appropriate follow-up questions depending on the responses given by the participants (Yin 2003). The questions were drawn from previous findings in literature. A number of alternative follow-up questions were prepared to cover different scenarios. Interviewed data was collected at one point in time.

Data Collection

Sixteen participants from eight organisations were interviewed. Table 1 provides a summary of participating organisations (all pseudonyms) and the number of participants interviewed. The participants included CEOs, managing directors, general managers, managers in a supply chain and IT related positions. They were selected because of their involvement in the supply chain processes. The organisations came from three industries: Fast Moving Consumer Goods (FMCG), healthcare, and foodservice. In the FMCG, the retail supermarket sector was selected; healthcare (hospitals); and foodservice (manufacturers and catering services which include restaurants, shops etc).

Table 1: Summary of Participating Organizations and Interviewees

Industry	Organisations	Number of participants
(a) Fast Moving Consumer Goods (FMCG-Retail)	Manufacturer MRU	8
(b) Healthcare	Hospital HHA, HHE, HHG and HHK	5
(c) Foodservice	Manufacturer MFP and MFU; Shop SFU	3 (plus 7 participants from manufacturer MRU)

Manufacturers MRU and MFU belong to the same parent company and both manufacturers were located at the same site. Seven out of the eight interviewees from Manufacturer MRU were also responsible for some of the supply chain functions for the Manufacturer MFU, and therefore were also questioned on the foodservice industry because of their knowledge of Manufacturer MFU. They were also asked to compare the two industries.

An in-depth interview was conducted and a recording device was used. All interviews were then transcribed, and documentary and archival evidence was also collected from a variety of sources such as websites and newspapers related to the industry and organisations. Any documents, systems, equipment and products sighted during the interview were also noted. The transcripts were imported into NVivo (qualitative data analysis software) and themes and patterns were pre-defined based on the factors identified in the *inter-organisational collaborative* framework (see Figure 2, Appendix 1). The interviewees' replies were analysed and coded. Cross-case interpretive analysis was used as a lens to draw findings from these tables. The results were then examined by two other researchers, discussed and any discrepancies rectified.

Results and Discussions

For the purpose of this paper, we have only focussed on cultural factors. We first present a summary of the background and current status of the IOIS adoption for each of the industries followed by presentation and discussion of the two cultures specifically on *values* and *practices*.

Table 2 presents the background, the current status of IOIS adoption, and issues related to culture for each of the industries. The first column represents the IOIS adoption collaborative level for the organisations interviewed in that industry. For instance, *cooperation* indicates that the organisations were willing to share information and link business processes across different functional areas within the organisations (Premkumar 2002). The full explanation for each of the collaborative levels can be found in Table 3, Appendix 1.

Table 2: Summary of Adoption of IOIS in the Three Studied Industries

Industry (IOS adoption level)	Summary of industry background, its current IOIS adoption and industry culture in the IOS adoption process
FMCG-Retail (*Cooperation*)	**Background:** There are two major retail supermarket chains in Australia, namely Woolworths and Coles, and they account for 80% of retail sales. Hence, the two major retailers have extremely high purchasing power. The manufacturers market their products on TV, radio, newspaper, magazines or through the supermarket promotional leaflets and the end-customers come and purchase their products from the supermarkets. **IOIS Adoption:** This industry had changed over the years. The major retailers and their major manufacturers had adopted IOISs. They are now trading on-line and sharing information such as stock information. The adoption level is considered for this industry as *cooperation* (see appendix 1). **Industry Culture:** The major retailers and manufacturers had changed the industry culture. They are now working closer together to share information and collaborating in their supply chains.
Healthcare (*Communication*)	**Background:** Historically, the suppliers were the dominant parties in the industry; they dictated the price and the minimum quantity the hospitals must purchase. However, in the last couple of years, the hospitals, both in the private and public sectors, have consolidated through take-overs in the private sector or through the government's restructuring policies. The consolidation of the hospitals has resulted in greater purchasing power for the hospitals and a shift of purchasing power from the suppliers to the hospitals (the customers). **IOIS Adoption:** A few of the hospitals and a few suppliers had implemented IOISs. They only implemented basic on-line ordering systems. The nurses or supply chain personnel have to enter the purchase orders manually. The majority of the orders are still sent via fax or ordered through a telephone. The interviewed hospitals had implemented basic IOISs and, we classified the adoption level for this industry as *communication* (see appendix 1). **Industry Culture:** Lack of agreement on the standard of bar-coding between organisations, and the suppliers' unwillingness to accept the trading power shift to hospitals (due to consolidation of industry) had slowed down the advancement of the IOIS adoption process.

Industry (IOS adoption level)	Summary of industry background, its current IOIS adoption and industry culture in the IOS adoption process
Foodservice (*Isolation*)	**Background:** There are many suppliers and many customers in the foodservice industry. The manufacturers that were interviewed said they operated a push-pull mechanism where the manufacturers push their products into the foodservice distributors, and at the same time they try to influence the operator or the end-user to purchase their brands when they ordered from the distributors. Hence, the manufacturers do not sell directly to the end-users or operators but through the distributors. The profit margins on products, on average, are lower than those in the retail sector (a). **IOIS Adoption:** Only a very few large distributors had trialled using on-line ordering. There is no evidence related to the success of on-line ordering. We interviewed one café manager regarding ordering on-line. He said he still preferred to use a fax to send orders rather than ordering on-line. As for the manufactures MFP and MFU, they still received orders by telephone, by fax or in person. Hence, we classified the collaborative adoption level for this industry as *isolation* (see appendix 1). **Industry Culture:** The industry culture such as lack of trust and suspicion between organisations had inhibited the adoption process.

Organisational Culture

For the non-adopting organisations, the organisational culture had not been an issue but industry culture was (see next sub-section). However, for the adopting organisations, the interviewees from Manufacturer MRU agreed that the organisational culture had changed because the business had to grow to survive. The employees had seen the benefit of changing their *practices*, and their *values* were changed to reflect their actions and mode of conduct. The incremental adoption of an IOIS over the years had led to a change in organisational culture in Manufacturer MRU; i.e., it had changed the way they think and the way they do things.

> "No. Not really. I think ... Those days have gone where you get opposition from department and doing things. Everybody realises the way business go, the way business has to grow." Planning and Distribution Manager, Manufacturer MRU

> "<Manufacturer MRU> has to change its culture. I don't think it is as a response to what our customers are doing but as a response to what <Manufacturer MRU> is doing. It is not a response to somebody else; it is a response to what we needed to do as a business." Supply Chain Director, Manufacturer MRU

The interviewees who worked in both manufacturers MRU and MFU had emphasised that the cultures can be differentiated between the FMCG-retail and foodservices industries. Organisational culture is not an adoption inhibitor for these interviewees because for manufacturer MRU, i.e. retail side of the business, they adopted an IOIS but not in the case of manufacturer MFU, the foodservice side of the business. The way they go about doing business and how they approach their customers is different, between the two industries. This is indicated by the fact that these interviewees are able to adopt and differentiate between cultures for the two different industries. This leads us to the discussion on the influence of industry culture.

Industry Culture

Industry culture is shown to have an influence in all three industries in the adoption of IOISs. We will now present and discuss the issues for three industries.

FMCG-Retail Industry

The industry changed the way they do businesses as they are now trading on-line and the major retailers developed better relationships and open communication with the major manufacturers. The industry culture has changed from a closed (not sharing information) culture to an open (and sharing information) culture because people can see that the benefit of sharing information can lead to growth of the business and they are prepared to change their *practices* to achieve the objective. This supports Gordon's (2001) case on industry culture. Collaboration and trust between these organisations was developed over a number of years and now the organisations are more open to communication and willing to share information such as stock and sales; thus, their *values* in trust and level of collaboration have changed. The culture has moved to working together to achieve the benefits for all parties. Hence, this led to the collaborative level of *cooperation* (see Appendix 1).

> "Yes we certainly share information across systems and processes and certainly we work very closely and collaboratively." Customer Services Manager, Manufacturer MRU

A good example here is to show a cultural change that is needed for the project "primary freight". The objective of the project is for the major retailers to pick up the stock from the manufacturers instead of the manufacturers delivering of goods to the major retailers' DCs (Distribution Centres) and this changed the practice of delivering goods. Furthermore, the orders and delivery dockets were transmitted electronically from the manufacturers to the major retailers, and the goods were received automatically to the DCs with random checking. Hence, this shows that there is a cultural change and trust has been developed between the major retailers and the

manufacturers in the industry. This is different from the past as the manufacturers had to book their time for delivery and the quantities of goods were checked as part of the receiving process, and if the truck missed their receiving time with a DC, the manufacturers had to re-book another receiving time with the DC.

> *"... we send them electronic information about those orders before it even arrives at their DC so they know what they are getting, they know what product they're getting and they know what quantity, ... they know everything about that order before it turns up on their door step which mean they don't actually have to check off the stock at the time of receive and they just get automatically receiving in." Distribution and Operational Manager, Manufacturer MRU*

Healthcare Industry

The healthcare industry traditionally is dominated by suppliers: they dictate the price and the minimum quantity of goods hospitals must purchase. Hence, this practice generated lots of waste because of unused and expired products, so adopting an IOIS would be beneficial to the hospitals (Ford 2003). The consolidation of hospitals has lead to changes to power-based relationships. Now hospitals prepare to adopt IOISs as the means of reducing cost and waste. Information sharing between the hospitals and suppliers is virtually non-existent (except for implanted devices such as heart devices where the information (such as serial numbers) is shared).

> *"I think what happens in health is it is a gradual change ... [hospitals] have failed to use the power they have as buyers ... people like Johnson and Johnson, your Baxter, and ... have had a lot of power... if they said we're going to distribute in such and such way, or ... a minimum quantity will be ... then the hospital will go OK, whatever you say, that's fine. ... But what we're beginning to see hospital in Australia ... hospitals are realising: I got power; I can use it. ... may be we (manufacturers) have to change the way we thinking and other manufacturers are going to say, 'no, we're going to hold on to power at all cost!'" Project Leader, hospital HHG*

> *"... because of these changes, ... for instance, contracts being lead by state government directly to manufacturer, and they're cutting out the potential that middle operator ... Because they (the distributors) always kept all the information to themselves and not shared, and everyone goes "'well we don't need you and we can get along without you'" Project Leader, hospital HHG*

However, when it comes to adoption of an IOIS, suppliers were insisting that the hospitals follow their way of doing business because they used to have dominant power in the industry. Furthermore, the low degree of trust had inhibited the openness of information sharing between organisations. Hence, the industry culture played a role in the advancement of adoption of an IOIS and the collaborative adoption is considered to be at *communication* level (see appendix 1).

> *"But, I suppose, when it comes to the crunch, what you find is every single supplier wants things their own way, because they used to get their way." Project Leader, hospital HHG*

> *"What we don't have, I think, in the health sector is trust. I don't think generally speaking there is a high degree of trust between any of the parties. It is very much about power, and keeping information to ourselves." Project Leader, hospital HHG*

This is further illustrated by the issue of disagreement over bar-coding standards for products. The two industry groups, namely GS1 Australia and Health Industry Business Communications Council of Australia (HIBCC), disagreed over standards for products. GS1 Australia created an EANnet health system based on "GS1 bar-coding standard" and the health authorities recommended all the manufacturers complied with the standard (HIBCC 2006). On the other hand, HIBCC (2006) did not agree because they argued that the EANnet system is a proprietary system that did not support the "UPN bar-coding standard" that they are currently using. HIBCC (2006) argued that:

> *"The EANnet system is <u>not</u> an open system that supports the HIBC (Health Industry Bar Code) as the unique identifier for products. Subscribing to the EANnet system requires a substantial investment by suppliers of medical devices, which we believe to be unjustified ... A position by NSW Health to give carte blanche support to a proprietary technology platform, and <u>to use their market influence to coerce suppliers to also take up this service, against their will, and restricting their choice on content aggregation services,</u> has the potential to create a monopoly for the provision of content aggregation services."*

In summary, the organisations in this industry do not collaborate and work to the same level as in the case of FMCG-retail industry. The manufacturers did not believe they would gain much benefit in adopting an IOIS with hospitals. By adopting an IOIS and changing their *practices*, they might lose financially because of the loss of sales through better stock management by hospitals. Furthermore, they still tried to maintain their dominant position in the supply chain network.

Foodservice Industry

The foodservice industry consists of many suppliers and many customers. The industry is changing as large distributors decide to have their own brand of products, and their products are now competing against products from the manufacturers, for example MFU and MFP. On the other hand, some manufacturers have decided to deal directly with the end-customers, by-passing the distributors. Furthermore, the trust level in the foodservice industry between the manufacturers and distributors is extremely poor when comparing it with the FMCG-retail industry; both sides are suspicious of one another. It is not a surprise to see the organisations in the foodservice industry do not want to share information.

> "There is constant, constant suspicion. Foodservice distributors are going down the path that all the commodity products are getting into your own brand ... They actively work against the manufacturer's brands ... On the other hand, some manufacturers are started to go direct to the chef... They are pressure on both side - the distributors are suspicious of what the manufacturers are doing; the manufacturers are suspicious of what the distributors are doing. So the relationship that is built on working together but everyone is suspicious how long this is going to last." Managing Director, Manufacturer MFU

When asked about when the foodservice industry will adopt an IOIS like that of FMCG-retail, the *Customer Services Director* of *Manufacturer MFP* replied:

> "It has to be a meeting of the 'mind' of the very top end of the business, right, and only after meeting of the 'mind' ... In other words, a very senior people of the stakeholders involved and would have to be absolutely agreement and support of the whole concept. Have to be driven down and can't be driven up... it has to start with true meeting of the mind."

The *customer services director* added that the adoption of an IOIS would not happen in the short term and it would take about ten years to get an IOIS in place. It is difficult for the foodservice industry to commit to adopting an IOIS if the industry culture does not facilitate this. Hence, the collaborative adoption level has remained at the level of *isolation* (see Appendix 1).

Conclusions, Limitations and Future Study

In this paper, we presented and examined organisational and industry cultures. An organisational culture influences IS adoption within an organisation whereas an industry culture influences IS adoption by all the organisations within an industry. *Values* and *practices* in a culture were examined in detail and we argue that *practices* have greater influence in an industry culture.

Industry culture, not organisational culture, is demonstrated to have a stronger influence in the outcomes of the adoption of an IOIS. We have claimed that the importance of a cultural phenomenon in an industry environment has influenced organisations both as a driving or inhibiting factor in the adoption of an IOIS. The industry culture could only be changed if individuals in the industry believed that changing their *practices* would give them benefit to survive in that industry (Gordon 2001). The research in industry culture is still scarce but we argue that future research in this area is worth pursuing as more organisations in different industries begin to develop more IOISs to improve the efficiency and effectiveness in the business processes between organisations.

The limitations of this study include the number of participants and organisations involved in data collection and the fact that only three industries were involved in the study. We argued that future research be conducted in the adoption of an IOIS and this should also include industry culture as one of the key adopting factors. We suggest that future studies might include longitudinal data collection to examine the changes of organisational and industry culture in the adoption of an IOIS over time; focus on the influence of a third party such as government or professional body in the industry culture; included more participants and organisations; and focus on the influence of global organisations on the "local" industry culture.

References

Barratt, M 2004, 'Understanding the meaning of collaboration in the supply chain', *Supply Chain Management-an International Journal*, vol. 9, no. 1, pp. 30-42.

Bunker, D 2001, 'A philosophy of Information Technology and Systems (IT & S) as tools: Tool development context, associated skills and the Global Technology Transfer (GTT) process', *Information Systems Frontiers*, vol. 3, no. 2, pp. 185-97.

Bunker, D, Kautz, K-H & Nguyen, ALT 2007, 'Role of value compatibility in IT adoption', *Journal of Information Technology*, vol. 22, no. 1, pp. 69-78.

Clark, GL 1997, 'Rogues and Regulation in Global Finance: Maxwell, Leeson and the City of London', *Regional Studies*, vol. 31, no. 3, pp. 221-36.

Chatman, JA & Jehn, KA 1994, 'Assessing the relationship between industry characteristics and organizational culture: How different can you be?' *Academy of Management Journal*, vol. 37, no. 3, pp. 522-53.

Christensen, EW & Gordon, GG 1999, 'An Exploration of Industry, Culture and Revenue Growth', *Organization Studies*, vol. 20, no. 3, pp. 397-422.

Drucker, P 1985, 'Getting things done: how to make people decisions', Harvard Business Review, vol. 63, no. 4, pp. 22-26.

Fombrun, CJ 1986, 'Structural Dynamics within and between Organizations', *Administrative Science Quarterly*, vol. 31, no. 3, pp. 403-21.

Ford, G 2003, 'Supply chain reform at the bedside', paper presented to Australian and New Zealand Supply Chain World Conference Sydney, 02-04 December 2003.

Gordon, GG 1991, 'Industry Determinants of Organizational Culture', *Academy of Management Review*, vol. 16, no. 2, pp. 396-415.

Hammer, M 2001, 'The superefficient company', *Harvard Business Review*, vol. 79, no. 8, pp. 82-91.

HIBCC 2006, *HIBCC Au Position on Decision by NETHA to Host the National Product Catalogue on EANNET*, <http://www.hibcc-au.com.au/Press%20Releases/HIBCC%20AU%20Position%20on%20EANnet.htm> viewed 21st May 2007.

Hofstede, G, Neuijen, B, Ohayv, DD & Sanders, G 1990, 'Measuring Organizational Cultures: A Qualitative and Quantitative Study across Twenty Cases', *Administrative Science Quarterly*, vol. 35, no. 2, pp. 286-316.

Karahanna, E, Evaristo, JR & Srite, M 2005, 'Levels of Culture and Individual Behavior: An Integrative Perspective', *Journal of Global Information Management*, vol. 13, no. 2, pp. 1-20.

Kumar, K & van Dissel, HG 1996, 'Sustainable collaboration: Managing conflict and cooperation in interorganizational systems', *MIS Quarterly*, vol. 20, no. 3, pp. 279-300.

Leidner, DE & Kayworth, T 2006, 'A Review of Culture in Information Systems Research: Toward A Theory of Information Technology Culture Conflict', *MIS Quarterly*, vol. 30, no. 2, pp. 357-99.

Love, PED & Gunasekaran, A 1997, 'Process reengineering: A review of enablers', *International Journal of Production Economics*, vol. 50, no. 2-3, pp. 183-97.

Orlikowski, WJ 1993, 'CASE tools as organizational change: Investigating incremental and radical changes in systems', *MIS Quarterly*, vol. 17, no. 3, pp. 309-41.

Pang, V 2005, 'Development of an inter-organisational system for supply chain management adoption framework: A proposed study of collaborative factors from supplier and customer perspectives', paper presented to 16th Australasian Conference on Information Systems, Manly, 29th Nov – 2nd Dec.

Pang, V & Bunker, D 2007, 'Inter-Organisational Systems (IOSs) for Supply Chain Management (SCM): A Multi-Perspective Adoption Framework', paper presented to 11th Pacific Asia Conference on Information Systems, Auckland, New Zealand, 3rd – 6th July.

Phillips, ME 1994, 'Industry Mindsets: Exploring the Cultures of Two Macro-organizational Settings', *Organization Science*, vol. 5, no. 3, pp. 384-402.

Pizam, A, Pine, R, Mok, C & Jae Young, S 1997, 'Nationality vs industry cultures: which has a greater effect on managerial behavior?' *International Journal of Hospitality Management*, vol. 16, no. 2, pp. 127-45.

Premkumar, GP 2000, 'Inter-organizational systems and supply chain management: An information processing perspective', *Information Systems Management*, vol. 17, no. 3, pp. 56-69.

Serour, MK & Henderson-Sellers, B 2002, 'The role of organizational culture on the adoption and diffusion of software engineering process: an empirical study', in D Bunker, D Wilson & S Elliot (eds), Adoption and Diffusion of IT in an Environment of Critical Change, Univ. New South Wales, pp. 76-88.

Taylor-Cummings, A 1998, 'Bridging the user-IS gap: a study of major information systems projects', *Journal of Information Technology*, vol. 13, no. 1, pp. 29-54.

Wu, W 2005, Carrying out contract successfully ends up with an IT Outsourcing failure: Relationship Management Cases of IT Outsourcing in a Cross-Cultural Context', paper presented to 16th Australasian Conference on Information Systems, Manly, Australia, 29th Nov – 2nd Dec.

Yin, RK 2003, *Case study research: design and methods*, Sage Publications, Thousand Oaks, Calif.

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Appendix 1

We conducted an exploratory study to examine and understand on how organisations (a supplier and a customer) collaborate to adopt IOIS in a supply chain network, we examine a number of factors that influence the collaboration process (Pang 2007). These factors include strategic management; organisational characteristics; top management support; financial (cost savings); value added; resource dependency; interests; needs and motivation; power; trust; selecting a partner; IS/IT readiness including selection of technologies and infrastructure; external influenced by a third party; and organisational and industry cultures (Pang 2007). We use the framework as shown in Figure 2 published by Pang and Bunker (2007) as a lens through which to understand collaboration and interaction between organisations. For instance, how the top management from customer and supplier collaborate to develop an IOIS collaborative strategy?
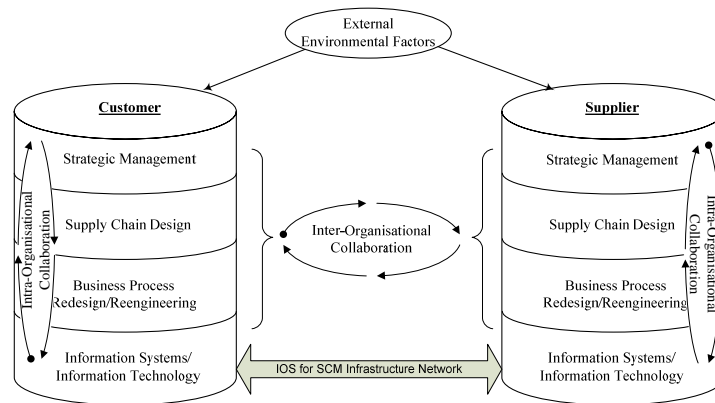

Figure 2: IOS for SCM Adoption Framework (source: Pang and Bunker 2007)

Table 3: Levels of Collaborative Sophistication in IOIS for SCM (source: Premkumar 2000, p.99)

Collaborative Level	Description
Cooperation	"An advanced form of sophistication in IOIS where two organizations have the same interest, motivation and share the common goal. Cooperation between organizations includes sharing information and linking business processes over across different functional areas within the organizations."
Coordination	"This is more advanced form of sophistication in IOIS and is built from a direct computer-to-computer communication as well as integrating with other systems in the organizations. There is active coordination in terms of production planning, delivery schedule, and logistics coordination between the partners."
Communication	"Simplest form of sophistication in IOIS and electronic messages are transmitted between organizations where the IOIS may or may not be integrated with other systems in the organizations. Essentially at this level, firms are substituting paper, phone or fax modes of communication for computer-to-computer communication."
Isolation	No IOIS is adopted between organizations, and the trading between these organizations remains manual (i.e. based on face-to-face, telephone or fax).

Appendix 2

Table 4: Levels of Culture (source: Karahanna et al. 2005, p.6) [Note: references in this table are not included in the Reference section]

Level	Definition
Supranational • Regional • Ethnic • Religious • Linguistic	Any cultural differences that cross national boundaries or can be seen to exist in more than one nation. Can consist of: • Regional – Pertaining to a group of people living in the same geographic area • Ethnic – Pertaining to a group of people sharing common and distinctive characteristics • Linguistic – Pertaining to a group of people speaking the same tongue
National	Collective properties that are ascribed to citizens of countries (Hofstede, 1984)
Professional	Focus on the distinction between loyalty to the employing organization versus loyalty to the industry (Gouldner, 1957)
Organizational	The social and normative glue that holds organizations together (Siehl & Martin, 1990)
Group	Cultural differences that are contained within a single group, workgroup, or other collection of individuals at a level less than that of the organization

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