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Isomorphic Factors in the Adoption of ERP by Indian Medium-Sized Firms

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Isomorphic Factors in the Adoption of ERP by Indian Medium-Sized Firms

Abstract

Purpose

The paper adopts an institutional theory perspective to investigate the adoption of ERP systems by medium sized firms in India. The rationale for this study is to provide a more complete understanding of ERP adoption, moving beyond the traditional technical and economic perspectives to include social, cultural and structural influences. These later influences are more implicit, insidious and pervasive and hence require elucidatory studies such as this, but offer a greater understanding of the adoption of IS.

Design/methodology/approach

The study is undertaken by means of nine case studies of medium sized firms in India that have adopted ERP systems. Qualitative interviews were undertaken with a range of staff in each firm and are supplemented by data from other sources such as site visit notes.

Findings

Institutionally based studies have tended to focus on three high-level isomorphic pressures: coercive, normative and mimetic. The study identifies number of more detailed factors that contribute to each of these three pressures. These more detailed factors are then used to consider how factors interact in the Indian context of the study.

Originality/Value

The conceptual contribution of this study is to move beyond the technical and economic rationales frequently identified for the adoption of IS by identifying influences that are social, cultural and structural in nature. The study shows that the three high level isomorphic pressures, mimetic, coercive and normative are comprised of more detailed factors. The empirical contribution of the paper is to identify these detailed factors, and to explore their influence, in the case of ERP adoption by Indian medium-sized firms. The study is of value to practitioners, since it is at the detailed level of factors that managers can recognize the forces they are subject to and can take action. It is also valuable to researchers since the detailed factors help address two limitations of institutional theory; a lack of agency perspective and a degree of conceptual ambiguity.

Keywords: isomorphic pressures, institutional theory, ERP, India, medium sized firms

Article Classification: Research paper

1. Introduction

Previous studies of the adoption of major IS by organizations have focused on technical and economic rationales, such as access to real-time information, replacement of legacy systems and improved profitability (Shang and Seddon, 2002; Nah et al., 2003; Ahmad et al, 2014). The rationale for this study is to provide a more complete understanding of ERP adoption: moving beyond the traditional technical and economic perspectives to include social, cultural and structural influences. These later influences are more implicit, insidious and pervasive and hence require studies such as this to make them explicit. Recognition of such influences allows problems in previous studies to be addressed, for example; lack of difference in adoption between firms in very different settings (Ahmad et al, 2014), explanations of adoption when benefits are not clear or have not been identified (Ward and Daniel, 2012) or the rapid growth in the popularity of practices or systems (Abrahamson, 1991; Daniel et al, 2012).

Institutional theory suggests that organizations are exposed to isomorphic pressures from their context that encourage them to adopt similar structures and practices, including the adoption of IS (DiMaggio and Powell, 1983). These pressures comprise a range of social, cultural and structural influences. This study adopts an institutional perspective of the adoption of information systems (IS). As observed by Orlikowski and Barley (2001, p.154) an *“institutional perspective would offer IT researchers a vantage point for conceptualizing....that is shaped as much by cultural and structural forces as much as by technical and economic ones”*. Technical and economic rationales for much IS adoption have been found to be largely consistent across different contexts as technical challenges and profit orientation are similar (Ahmad et al, 2014). However social, cultural and structural influences will be idiosyncratically context-specific, suggesting studies seeking to understand IS adoption should include such perspectives if they want to understand the impact of different contexts.

Our study considers the adoption of ERP (Enterprise Resource Planning) systems, by medium sized firms in India. We focus on ERP systems because they have been in use by larger firms, both internationally and in India for a significant period (Davenport, 1998; Garg and Garg, 2014). Considering a widely adopted and established IS means that the isomorphic pressures we wish to study exist and have had time to develop. That is, later adopters are influenced more by isomorphic pressures than earlier adopters (Ugrin, 2009). Medium sized firms in India are relatively late adopters of ERP (Sharma et al, 2012) and therefore ERP adoption in medium-sized firms provides an ideal setting in which to study the influence of isomorphic pressures.

It is well documented that the economy in India is growing rapidly (Golley and Tyers, 2012; Ramakrishna, 2011), fueled both by domestic production and production for global export. We focus on small and medium sized enterprises (SMEs) as these are a vital part of this economic growth. For example SMEs produce approximately 40% of manufacturing output of India (Dixit and Pandey, 2011; Sharma and Ali, 2010). In order to compete, Indian SMEs have been encouraged to adopt IS by both endogenous and exogenous influences, the latter including business advisors and the government (Madon et al, 2009).

We provide a broader perspective of ERP adoption and identification of the more detailed factors involved by addressing the following research question:

- what are the detailed factors that contribute to the three high-level isomorphic pressures in the adoption of ERP?

Whilst the findings to our first research question are shaped by the Indian context of our study, our second question seeks to explore the role of the Indian context of our study further by considering if and how the isomorphic factors interact and hence have the potential to reinforce their influence. Such reinforcement provides the opportunity for significant differences across contexts. Hence we address the following question

- do the detailed factors inter-relate in the Indian context, and if so how?

The paper commences with a review of the literature relevant to the study and a discussion of the derivation of the research questions. This is followed by a description of the case study methodology adopted for the empirical investigation. We discuss the multiple detailed isomorphic factors identified and how these relate to the Indian context of our study. We conclude with a discussion of the findings including the implications for practicing managers and theory development. We also present the limitations of the study and opportunities for further research.

2. Literature Review

The study draws on two bodies of extant literature. Firstly literature addressing the adoption of ERP systems, with particular consideration of studies of adoption by Indian firms, is reviewed. Secondly literature addressing institutional theory as applied to the IS domain is reviewed. The literature is used to identify gaps in current knowledge and hence justify the research questions.

2.1.ERP Adoption Literature

The existence of ERP systems over the last 25 years, their importance to a wide range of industries and organizations and their global spread has led to a significant body of literature that spans rationales for adoption (e.g. Ahmad et al, 2014), implementation (e.g. Markus and Tanis, 2000; Marnewick and Labuschagne, 2005), success and failure (e.g. Nah et al, 2003; Venugopal and Rao, 2011), and geographical and industry sector perspectives (e.g. Kumar et al, 2002; Annamalai and Ramayah, 2011). It is not possible to include a review of such an extensive body of literature and hence we focus on those areas most relevant to our study: definitions of ERP systems, their use by SMEs, factors influencing adoption of ERP systems including studies of adoption by Indian firms.

ERP systems can be defined as a suite of software modules that allows an organization to automate and integrate the majority of its business functions by sharing common data and business processes across the enterprise (Davenport, 1998; Klaus et al., 2000; Zhang and Li, 2006; Jacobs and Weston, 2007) and across entire supply chains (Davenport and Brooks, 2004). ERP systems have been associated with a wide range of benefits including; reduced order cycle time, reduced stock holding, real-time management information and improved customer service (Shang and Seddon, 2002; Nah et al, 2003). However, such systems also have significant challenges which include high cost of implementation, the need to reengineer business processes, implement significant organizational change and train large numbers of staff (Garg and Garg, 2013; Mabert et al, 2003; Muscatello et al, 2003).

Initially, most ERP adoption was by large organizations (Davenport, 1998; Jacobs and Weston, 2007). However over the last decade or more, SMEs found that they too could benefit from the adoption of ERP systems, aided by suppliers developing lower cost systems adapted for such firms (Sharma and Bhagwat, 2006, Chang et al, 2008; Kale et al, 2010). SMEs have realized similar benefits as large firms from their ERP systems, such as reduced order cycle times and improved customer service (Sharma et al, 2012). However, SMEs may

have additional rationales for adoption: many smaller firms are part of extended supply chains. Adoption of ERP systems has allowed them to participate in information sharing across the supply chain and participate in practices such as vendor managed inventory (Coelho and Laporte, 2015). As will be explored further in this study, adoption of ERP in order to fit with customers or suppliers represents a coercive isomorphic pressure (Aubert et al, 2012).

A significant number of studies have considered the rationales or influences encouraging organizations to adopt ERP systems (e.g. Ram et al, 2013). In a meta-analysis of previous studies, Ahmad et al (2014) identify twelve rationales for adoption, eleven of which they view as endogenous and which are technical or economic in nature. These include: operational improvements, legacy system replacements, business growth and regulatory compliance. In contrast, they merge all external rationales into just one single high level description: *'the decision to implement an enterprise system did not originate with the organization'* (p.704), suggesting such external rationales are under-emphasized and under-researched. Other studies have focused on single more detailed external forces such as government subsidies (Spathis and Constantinides, 2004) and the influence of a parent organization, customer or supplier (Kumar et al, 2002; Sharma et al, 2012).

Our study is based in India and hence the adoption rationales of Indian organizations are salient. Prior to 1990s the Indian market was highly protected (Dangayach and Deshmukh, 2006). Since liberalization, firms of all sizes have had to become more competitive with international firms (Wilson and Keim, 2006; Thakur and Jain, 2006). This has led to the rapid adoption of IT systems such as ERP in order to improve efficiency, enabled by the world-class standards of technical education provided by Indian Universities (Thatchenkery et al, 2004; Golley and Tyers, 2012). Despite these prominent features of the Indian context, studies of adoption and implementation of ERP undertaken in India have found similarities with other countries. For example, Ahmad et al (2014) compare the twelve rationales for adoption across international and Indian firms and find the same rationales are present in both. There is a slight difference in the frequency of occurrence of the rationales, but the authors do not provide possible explanations for this. Kale et al (2010) find that Indian SMEs adopting ERP realize similar benefits and have similar success factors to firms in other countries. Investigation of the economic and technical factors influencing ERP implementation in Indian retail firms finds *'the results are largely consistent with studies conducted in other developed countries'* (Garg and Garg, 2014, p.441). As we shall discuss in a subsequent section that presents our perceived gap in the literature, we suggest that it is consideration of the social, cultural and structural factors that is required to fully illuminate the influence of geographical context on adoption and implementation.

2.2. Institutional Theory in IS Research

Institutional theory recognizes that organizational structures and practices are influenced by the existence and operation of institutions in an industry or country, where institutions include legal systems, governance mechanisms, capital markets, other organizations and cultural and professional norms. Comprehensive reviews of the use of institutional theory in IS have been undertaken by Weerakkody et al (2009) and Mignerat and Rivard (2009). Weerakkody et al (2009) note that *'in the area of Information Systems (IS), the use of institutional theory remains in its infancy'* (p.354) and that positivist, quantitative research predominates. Mignerat and Rivard (2009) find just 53 studies of institutional theory applied to the IS/IT domain over a period of 20 years, again suggesting there is considerable scope to undertake further such studies.

One strand of institutional theory suggests that the institutions in a given context will cause organizations to adopt similar structures and practices. Hence over time, the organizations will tend to become similar or isomorphic (Hoffman, 1999; Meyer and Rowan, 1977; Scott, 2007; Zucker, 1987). Weber (1952) ascribed the isomorphic tendency to rationalism, bureaucracy and competition within capitalist markets, which forced similar structures and responses on managers and their firms. DiMaggio and Powell (1983) broadened this view by identifying three pressures which lead to isomorphism: coercive, mimetic and normative. Although their work was carried out almost three decades ago, the three pressures have endured and have been adopted as the theoretical basis for the majority of studies that consider institutional isomorphism in the IS domain (e.g. Lai et al, 2006; Son and Benbasat, 2007; Teo et al, 2003).

Coercive pressures describe firms being compelled to adopt similar structures and practices. This coercion may be informal or formal in nature (Teo et al, 2003; Liu et al, 2010). Informal pressures may arise *'from cultural expectations in the society within which the organizations function'* (DiMaggio and Powell, 1983, p.150). Formal pressures include government regulations and requirements such as tax, accounting regulations and national security and health initiatives (Hutter, 2006; Currie and Guah, 2007; Ball et al, 2010) and the requirements of major customers or suppliers (Teo et al, 2003; Aubert et al, 2012). The effects of coercive pressures have been included in a number of studies of the adoption of IS, particularly inter-organizational information systems (IOS) which are prone to the influence of the more powerful partner (Teo et al, 2003). In contrast, Son and Benbasat (2007) found that coercive pressures did not contribute to adoption of B2B e-marketplaces, since they facilitate the identification of new trading partners and hence are less prone to the influence of established power dynamics. Like many extant studies, these authors included only a single coercive factor (perceived dominance of supplier) in their study, rather than the multiple factors identified in this study.

Mimetic isomorphism arises from uncertainty (Hoffman, 1999; Meyer and Rowan, 1977; Scott, 2007). Based on earlier studies, DiMaggio and Powell (1983) argue that when conditions are uncertain, for example due to rapid technological or market change, firms will imitate other, seemingly successful or legitimate firms. This behavior is referred to as *'modeling'* (Haunschild and Miner, 1997) and can arise from a number of causes including; recruiting employees from the other firms, using consultants, participating in industry associations and outsourcing (Lai et al, 2006; Pearson and Keller, 2009; Nicholson and Sahay, 2009; Liu et al, 2010). Mimetic pressures have been found to be important in the adoption of IS systems. For example, Lai et al (2006) find that *'mimesis'* contributes to the adoption of radio frequency identification (RFID) in the supply chain. Similarly Liu et al (2010) find that mimetic pressures contribute to the adoption of internet-enabled supply chain management systems.

Normative isomorphism arises from professionalization (Meyer and Rowan, 1977; Zucker, 1987). Following Larson (1977) and Collins (1979), DiMaggio and Powell (1983) described professionalization as *'the collective struggle of members of an occupation to define the conditions and methods of their work ... and to establish a cognitive base and legitimization for their occupational autonomy'* (p.152). Two particular mechanisms of normative isomorphism are identified: professional networks and formal education (Jeyaraj and Sabherwal, 2008; Nicholson and Sahay, 2009; Rajão et al, 2009). Normative pressures also

operate through consistency of job titles and roles across firms. This is often a by-product of increased professionalization and is also associated with centralization (Pearson and Keller, 2009) the latter often being a feature of IS departments, particularly in small and medium sized firms. Teo et al (2003) explored the adoption of financial EDI (FEDI) and found that normative pressures had a stronger influence than coercive or mimetic pressures. They ascribed this finding to the endorsement and support from business and professional associations. Like our study, these authors consider the influence of the cultural context of the study which was undertaken in Singapore. They ascribed this strong influence of normative pressure to the national culture where ‘*citizenry looks towards leading institutions for guidance and leadership on strategic issues*’ (Teo et al, 2003, p. 40).

An institutional theory lens has been applied to the adoption of ERP by both Ugrin (2009) and Pishdad and Haider (2013). Whilst both demonstrate the importance of considering social and cultural influences on adoption, supporting our approach, they did not seek to uncover the detailed factors that we identify. The three isomorphic pressures and the factors contributing to them identified in previous studies are summarized in Table 1.

It should be noted that there are criticisms of institutional theory. These include its lack of an agency perspective, as it positions managers as victims of exogenous pressures (Currie, 2009). More recent studies have explored how and why agency plays a part in altering institutionalized patterns of behavior (Deejan et al, 2004; Garud et al, 2002; Garud et al, 2007). Other criticisms include conceptual ambiguity, for example, in the degree of overlap between the three isomorphic pressures (Currie et al, 2009; Hasselbladh and Kallinikos, 2000).

Table 1: Isomorphic Pressures and Contributing Factors

| Isomorphic Pressure | Contributing Factors | Extant studies from IS domain |
|---|--|---|
| Coercive <i>Formal and informal pressures such as government regulations or local culture</i> | Government requirements | Hutter, 2006; Currie and Guah, 2007; Nicholson and Sahay, 2009; Ball et al, 2010 |
| | Influence from trading partner | Aubert et al, 2012 |
| | Need to mirror other organizations in order to interact easily | Chelwos et al, 2001; Son and Benbasat, 2007 |
| | Cultural influences | Marcus and Gould, 2000; Teo et al, 2003; Madon et al, 2009 |
| Mimetic <i>Arising from uncertainty – firms will imitate other firms that appear successful or legitimate</i> | Use of consultants | Lai et al, 2006; Pearson and Keller, 2009; Nicholson and Sahay, 2009; Liu et al, 2010 |
| | Outsourcing | Pearson and Keller, 2009 |
| | Employee transfer | Lai et al, 2006 |
| | Wide or demanding customer base | Haunschild and Miner, 1997 |
| Normative | Professional networks and trade associations | Jeyaraj and Sabherwal, 2008; Currie 2009; Nicholson and |

| | | |
|--|--|--|
| <i>Arising from professionalization, particularly of functional fields</i> | | Sahay, 2009 |
| | Formal educational programmes and training | Currie et al 2009; Nicholson and Sahay, 2009; Rajão et al, 2009; Madon et al, 2009 |
| | Commonality of job titles | Pearson and Keller, 2009 |
| | Centralization of IT | Pearson and Keller, 2009 |

2.3. Gap in Literature and Justification of Research Questions

Our review of the ERP adoption literature highlights that previous studies have focused on economic and technical factors and have been largely insensitive to institutional factors (Kale et al, 2010; Garg and Garg, 2013; Ahmad et al, 2014). Extant institutionally-based studies have tended to focus on single factors and do not consider multiple factors. Our first research question therefore brings together these two omissions and asks: what are the detailed factors that contribute to the three high-level isomorphic pressures in the adoption of ERP? Whilst the findings to our first research question are shaped by the Indian context of our study, our second question seeks to explore the role of context further by considering if and how the isomorphic factors in a specific context interact and hence have the potential to reinforce their influence, amplifying their influence and leading to differences across contexts. We therefore ask: do the detailed factors inter-relate in the Indian context, and if so how?

Figure 1 presents a conceptual model that was developed in order to address the research questions. The three isomorphic pressures are identified as influences on the decision to adopt ERP (e.g. Teo et al, 2003; Ugrin, 2009). These high level pressures manifest as multiple, detailed factors. A positive decision to adopt is associated with actual adoption (Ajzen, 1991). In addition to the isomorphic pressures, and as explored in the majority of studies of ERP adoption, the decision to adopt is also influenced by economic and technical factors (e.g. Ahmad, 2014). Our two research questions are located on Figure 1.

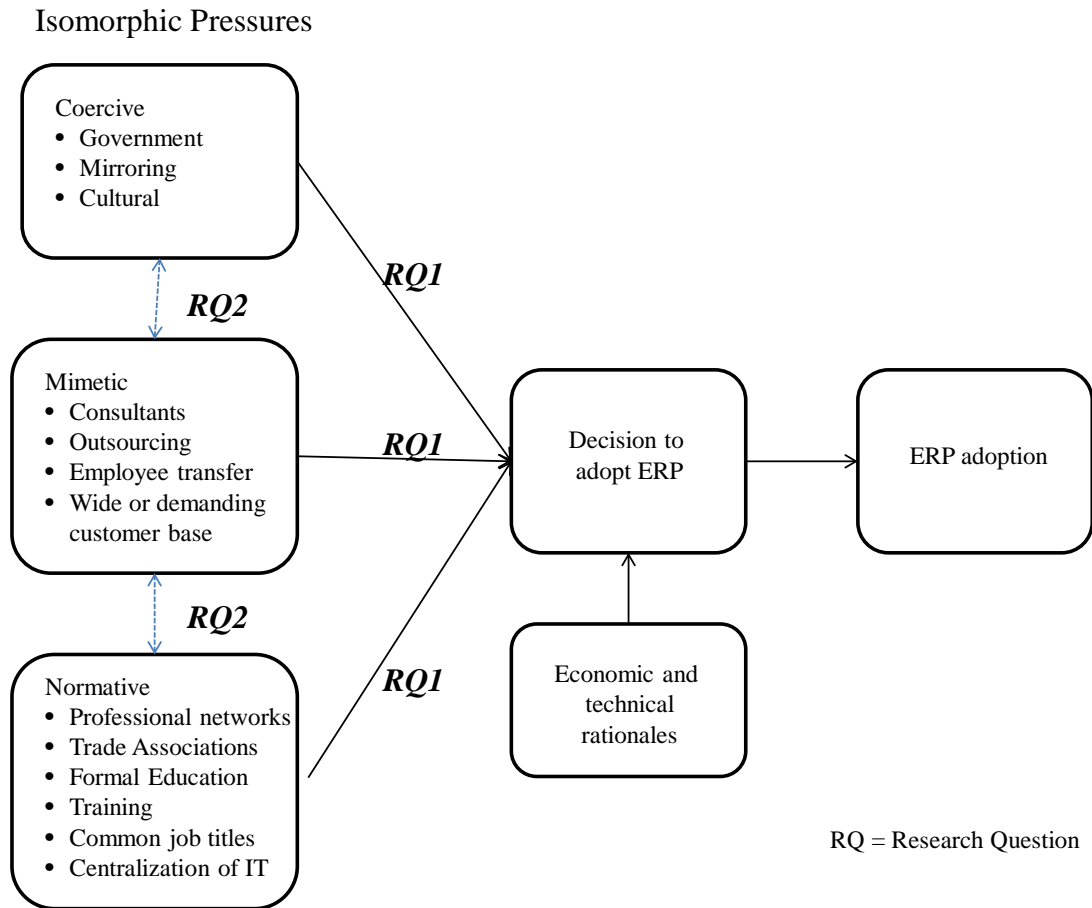


Figure 1. Conceptual Model

3. Research Methods

As identified by Weerakkody et al (2009) extant studies in the IS domain tend to be positivist, quantitative studies. This contributes to a limited consideration of the three isomorphic pressures or a focus on a limited number of detailed factors. Since we did not wish to pre-specify or limit the number and nature of the factors identified, we adopted a qualitative method based on semi-structured interviews that were brought together with other data to form multiple case studies (Eisenhardt, 1989; Hoskisson et al, 1999; Yin, 2003).

3.1. Data Collection

An intention of our study was to show that the varied factors that contribute to isomorphism occurred across a range of medium-sized firms in India and were not restricted to firms in certain sectors. We therefore undertook multiple case studies (nine firms across five sectors), which are summarized in Table 2. We found that nine case studies and five sectors provided an acceptable balance between the analytical generalization that we sought and data collection and analysis.

Interviews were undertaken with three individuals in most of the case study firms. Interviewees included: the Chairman (for perspectives of the wider business performance of

the firm and the overall decision to adopt ERP), an IT or ERP Implementation Manager (for perspectives on detailed issues, such as implementation partners or consultants) and a representative of users (for perspectives on issues such as training). These different perspectives allowed rich data to be collected and also allowed triangulation which contributed to the internal validity of the study (Bryman and Bell, 2007). As shown in Table 2, we undertook a total of 27 interviews across the nine case study firms, each of which lasted from one to four hours. Inclusion of multiple case studies across different industries contributed to the external validity of the study (Bryman and Bell, 2007).

Table 2: Case study firms and interviewees

| Case | Number of employees | Industry | Interviewees | Interview location |
|--------|---------------------|-----------------|--------------|----------------------|
| Firm 1 | 300 | Car parts | 3 | Haryana, India |
| Firm 2 | 200 | Car parts | 3 | Haryana, India |
| Firm 3 | 150 | Car parts | 2 | Haryana, India |
| Firm 4 | 300 | Pharmaceuticals | 3 | Uttar Pradesh, India |
| Firm 5 | 125 | Clothing | 3 | Haryana, India |
| Firm 6 | 300 | Cable | 3 | Uttar Pradesh, India |
| Firm 7 | 200 | Clothing | 4 | Haryana, India |
| Firm 8 | 180 | Cable | 3 | Haryana, India |
| Firm 9 | 270 | Sponge iron | 3 | Delhi, India |
| Total | | | 27 | |

A semi-structured interview schedule was used to guide the interviews. This included open questions and general prompts to encourage the interviewees to describe the range of factors that influenced their adoption of ERP. Topics discussed during the interview are shown in Appendix 1. The interviewer was alert to descriptions of the factors identified in extant literature, and prompted the interviewees if they did not mention these spontaneously. Interviews were conducted either in English or the local language. Interview data were supplemented with other data sources such as, observations made during the interview visit, examination of the businesses' websites, promotional and marketing materials and press coverage (Denzin and Lincoln, 1998). All interviews were recorded.

Whilst we reflected on each case study as it was undertaken, we completed all nine case studies before formal analysis was undertaken. Whilst this does not allow the iterative or recursive approach included in methods such as grounded theory (Strauss and Corbin, 1990), this was a pragmatic requirement arising from undertaking data collection overseas.

3.2.Data Analysis

All interviews were fully transcribed and where necessary translated into English. Coding adopted a thematic approach (Boyatzis, 1998) in which sections from the transcripts describing rationales for, and processes of, adoption were identified and given an appropriate label (codes). Coding was first carried out within cases and then compared across cases. The additional sources of data, such as site visit notes, were used to augment and triangulate interview data.

Similar codes were combined to produce a summary set of factors that contribute to isomorphic pressures (themes) (Ryan and Bernard, 2000). Consistent with a pattern matching approach to coding (Dey, 1993; Miles and Huberman, 1994), we then compared the factors identified to the three high-level isomorphic pressures. The factors were not forced or constrained to fit the three pressures, rather it was an open matching process (Dey, 1993). Data that appeared to relate to more than one of the isomorphic pressures was coded under all of the relevant high-level pressures and identified as a potential inter-relationship.

4. Findings

In this section we first evidence that isomorphism is occurring across the firms studied, justifying the topic and sample of our study. In order to address our first research question, we consider the detailed factors that contribute to each of the three high-level isomorphic pressures. In order to address our second research question and hence further understand how these detailed factors operate in the Indian context, we consider if and how certain factors inter-relate. Further data from the case studies to support the findings are presented Appendix 2.

4.1. Common Patterns of ERP Adoption

Extant literature on adoption of ERP by Indian firms has identified high levels of consistency in adoption rationales, implementation success factors and benefits realized (Kale et al, 2010; Ahmad et al, 2014; Garg and Garg, 2014). Our study, although limited in size due to its qualitative nature, supports these findings of common patterns across firms. Firstly, despite the variety of firm sizes and sectors shown in Table 2, all of the firms considered ERP was the best solution to the variety of different issues that they were facing. There was some variety in the approach to implementation, for example, eight firms used package software and one developed its own bespoke software; six firms adopted a big-bang approach to implementation whilst the other three adopted a phased approach and six used systems from large international implementation partners, whilst three used local providers. However, even these differences reflected a limited amount of variation.

4.2. Factors contributing to Coercive Pressures

A number of factors contributed to coercive pressure, ranging from formal government requirements, through quasi-formal requirements arising from parent firms and the need to operate effectively with customers and suppliers, through to more informal and diffuse coercive pressures arising from the Indian context in which the firms were operating. An example of a formal, regulation based pressure was the government requirement on the pharmaceutical firm (case study 4) to be able to track and report on the manufacture of all of their products. This requirement was a major influence of the firm adopting an ERP system.

Parent organizations can exert considerable coercive pressure on subsidiaries to adopt systems and follow certain practices. As well as operating in the regulated pharmaceutical industry, case study 4 was also a subsidiary of a German parent firm. They described how, whilst their parent firm did not mandate the adoption of their ERP system, they did exert a strong influence.

The need for firms in certain industries to work closely with suppliers or customers is another factor contributing to coercive isomorphic pressures. Large and powerful suppliers or customers can exert considerable influence over how they wish to trade with small or medium-sized firms (Chwelos et al, 2001; Teo et al, 2003). As described by the ERP Implementation Manager in case study 1, the demands from their single customer, which is a major car manufacturer, directly led to their adoption of ERP:

Our customer's demanding nature in terms of use of latest IT applications in business operations forced the firm to adopt ERP.... . (ERP Implementation Manager, case study 1)

Similarly, the Chief Information Officer in case study 2, which also produced car parts for large car manufacturers, stressed the need for them to be able to conform to the requirements of both customers and suppliers, suggesting coercive pressure.

Less formalized coercive pressures arising from the Indian context were evident in the case studies in two ways. Firstly, a number of the firms described how they were growing rapidly due to increased demand for their products. This rapid growth required them to improve efficiency, such as by the introduction of IS. For example, a director in case study 8, which manufactured cables, described how the rapid increase in demand had contributed to ERP adoption:

See there were many other reasons for us to implement ERP like our business was growing, demands for our products were increasing so production had to be increased and we have to manage that growth... (Director, case study 8).

As observed by DiMaggio and Powell (1983), coercive pressures can arise from 'cultural expectations' (p.150). Previous studies have identified Indians as high on the power distance measure (Hofstede, 1990; Marcus and Gould, 2000). In such cultures there is a great respect for authority and those with experience, and hence the views and decisions of senior managers to adopt ERP systems were not questioned. Similarly, whilst education *per se* is viewed as normative, many families and individuals within India hold education and the achievement of formal qualifications in high regard (Golley and Tyers, 2012; Thatchenkery et al, 2004), making it a cultural expectation and hence a form of coercive pressure for many.

4.3.Factors contributing to Mimetic Pressures

Respondents across the range of case study firms were explicit that their adoption of ERP had been influenced by the adoption of ERP systems by other firms. That is, they modeled themselves on other firms. For example, the IT Managers in firm 1 observed:

Some other firms in similar businesses had implemented ERP and it was one of the driving forces for us to adopt ERP. (IT Manager, case study 1).

The factors contributing to this modeling included benchmarking against firms in the same industry and also firms in other industries that were considered to be exemplars of ERP use. Some of the case study firms described how they learnt about the detailed operations of ERP systems by visiting other firms and observing the systems in use. In firm 3, which manufactured car parts, the Chairman described how he was a Board member of another medium sized company. He used this position to learn about their adoption of ERP:

I happened to be a board member of one company of our size. They were in the process of implementation. I spoke to their IT Manager. He told me the real story - it is wonderful, it will structure your processes. He made me understand the benefits that ERP can give even to small firms. (Chairman and Managing Director, case study 3).

Vendors or implementation partners (also termed consultants) were another important factor contributing to modeling. This included both copying from the vendors and consultants themselves and from other companies that the vendors and consultants had worked with. For example, firm 1 had a previous failed attempt at implementing an ERP system with a local vendor. A decision was made to select an international ERP vendor for the second adoption, because they believed such a vendor would have greater experience of implementing ERP in other firms on which they could model themselves. Case study firm 3 described how they carefully selected their vendor based upon their previous experience of working with small and medium sized companies. They felt that they would be able to learn from the vendor about how ERP could best be implemented and operated in the context of a medium sized business.

Prior literature has suggested that firms that have a wide or demanding customer base are likely to look at the activities of other firms as a means of satisfying these demands (Haunschild and Miner, 1997). We note that this notion of demanding customers is different to the 'demanding customers' discussed in the previous section. As noted in the previous section, the firms in the car industry had a very limited number of large customers who consequently had significant power over the firms resulting in their demands being coercive in nature. In contrast, when there are many customers, such as in consumer markets, individual customers tend to have little power, but the firms face uncertainty which they wish to reduce by modeling. The two case study firms that produced clothing both emphasized that customers in the fashion industry were not prepared to incur delays and hence the firms had to find ways of rapidly fulfilling customer demand. Case study firm 5 sold their products directly to consumers and described how their ERP system allowed them to identify where stock was being held across their multiple stores and transfer it to locations where there was customer demand. Case study 7 sold their clothes to major international retailers which they described as very demanding.

4.4.Factors contributing to Normative Pressures

Formal education is recognized as a key mechanism of normative isomorphic pressure (e.g. Jeyaraj and Sabherwal, 2008). Educational establishments, such as universities, seek to both develop and legitimize a cognitive base for the adoption and use of IS in business through teaching and research. Prior literature suggests that the effective adoption of large scale IS, such as ERP systems, requires a blending of both IT and management knowledge (e.g. Ward and Daniel, 2012). Table 3 shows the higher education (HE) qualifications in both IT and management for the three key stakeholders interviewed in each case study, all of whom were instrumental in their firm's adoption of ERP. It can be seen that the majority of those interviewed had a formal qualification in either one or both of these domains.

Table 3: Formal IT and Management Higher Education (HE) Qualifications of Interviewees

| Case | Chairman/CEO/Senior Manager | IT Director/IT Manager/Technical Advisor | Business Manager/Executive |
|--------|--|---|----------------------------|
| Firm 1 | Masters degree (IT and management) | Masters (IT) | None |
| Firm 2 | Masters degree (management) | Masters degree (IT) | None |
| Firm 3 | Masters degree (management) | Masters degree (IT) and Bachelors degree (management) | N/a |
| Firm 4 | Masters degree (management) | Masters degree (IT) and Bachelors degree (management) | None |
| Firm 5 | Masters degree (management) and Bachelors degree (engineering) | Masters degree (IT) | Bachelors degree (IT) |
| Firm 6 | N/a | None | None |
| Firm 7 | Bachelors degree (management) | None | None |
| Firm 8 | Bachelors degree (management) | Bachelors degree (IT) | None |
| Firm 9 | Bachelors degree (IT) | None | Bachelors degree (IT) |

‘None’ signifies no formal IT or management HE qualifications.

‘N/a’ (not available) signifies this category of staff was not interviewed for this case study

In addition to formal education, more informal education, such as that provided by in company training and executive education is also an important factor in the propagation of normative isomorphism. Whilst training is recognized as an experience product (Nelson, 1970), in that its efficacy and impact can only be assessed after consumption, the interviewees emphasized that the provision of training by the vendor was an important criterion within their vendor selection process. Hence, whilst the outcome of training cannot be considered an antecedent to adoption, we view the availability and nature of training as an antecedent to adoption.

The case study firms increased their understanding of ERP systems and their use in other firms by participating in professional networks. Professional networks propagate normative pressures by legitimizing and promoting certain practices amongst their members (Currie, 2009; Nicholson and Sahay, 2009). This may be via professional qualifications or accreditations (Misiewicz, 2007), or may be more informal knowledge exchange at networking events (Binz-Sharf et al, 2012). For example, the IT Manager in case study firm 1 noted:

Senior staff were members of ERP network associations and IT networks and through them also collected information about the latest IT applications available. (IT Manager, case study firm 1).

This quotation reflects the high power distance associated with Indians (Hofstede, 1990; Marcus and Gould, 2000) as it was seen that only senior managers should participate in such networks. This prevented the exposure of a wider range of staff to the information available from such networks and hence their ability to question adoption decisions.

Finally, similar job titles and common career paths within a domain establish a recognized set of roles and responsibilities across different firms and also establish relationships and hierarchies between these roles (Pearson and Keller, 2009). These common roles result in similar '*conditions and methods of ...work*' which DiMaggio and Powell (1983, p.152) describe as a major element of professionalization of a domain, which they in turn link to normative pressures. Such structuring of a professional domain also encourages the uptake of education and training, further increasing normative pressure, as each hierarchical level will be expected to have particular educational attainment or experience. The adoption of similar job titles and career paths also facilitates the transfer of staff between organizations, stimulating mimetic pressures. There was a startling homogeneity of job titles across the case study firms: the most common being: Chairman, General Manager, IT Manager and ERP Implementation Manager. The titles adopted were also very simple and clear, arising in part from the medium size of the firms involved in the study that tended to have simple structures compared to large organizations where roles and titles are often specific to the organization and less transparent.

4.5. The Indian Context

In order to address our second research question, we considered how the factors identified both arise from and are shaped by the Indian context of our study. These are summarized in Figure 2.

As noted, Indian culture places considerable emphasis on formal education as a means of personal improvement and social mobility. This has been reinforced by the Indian government placing emphasis on improving formal education as a means of economic development (Golley and Tyers, 2012; Thatchenkery et al, 2004). The high frequency of formal qualifications amongst the interviewees supports this cultural respect for education (coercive pressure) in the case study firms. As discussed previously, formal education has been linked to normative isomorphic pressures (Currie et al, 2009; Nicholson and Sahay, 2009; Rajão et al, 2009; Madon et al, 2009). This suggests that the cultural (coercive) pressure to gain formal qualifications by staff, and for firms to employ staff with such qualifications, will increase the normative pressure exerted by formal education on Indian firms. This interaction between the coercive pressure of culture and normative pressures of formal education is depicted as interaction A in Figure 2.

There also appears to be an interaction between the training and on the job experience of staff (normative) and the increased transfer of staff between firms, which is seen as a source of mimetic pressure (Lai et al, 2006). That is, as staff gain experience of ERP through training or on the job experience, they become more attractive to other firms, increasing staff transfer as described by the General Manager of case study 6:

In India the demand for ERP people is high and due to which implementation team members were changing frequently. (General Manager, case 6).

The interaction between the normative pressures arising from training and on the job experience and the mimetic pressure arising from increased transfer of staff between firms is shown as interaction B in Figure 2.

Another interaction is between the rapidly growing Indian economy and the increasing demands of customers. The case study firms perceived that they must respond to the rapid growth of the Indian economy (coercive pressure) by increasing production. For example the Director of Finance in case study 6 described the turnover of his firm increasing by almost 50% over the last two years. This rapid growth is both fueled by, and causing, an increase in prosperity for many Indians, which in turn causes their increasing demands for items such as fashionable clothes. For example the IT manager in case study 5 that manufactures clothes, described the rapidly changing tastes of their customers. Prior studies suggest that firms address the uncertainty related to demanding customers by seeking to model themselves on other firms (Haunschild and Miner, 1997). The interaction between the coercive pressure of needing to cope with economic growth and the mimetic pressure of seeking ways to address changing customer requirements is shown as interaction C in Figure 2. We are aware that the distinction between the firms feeling compelled or coerced to respond to growth in the market, which we view as coercive pressure, compared to a more discretionary view of responding to changing customer requirements by modeling on other firms is a subtle difference and provides an example of the possible conceptual ambiguity associated with institutional perspectives. We will discuss this further in the following section.

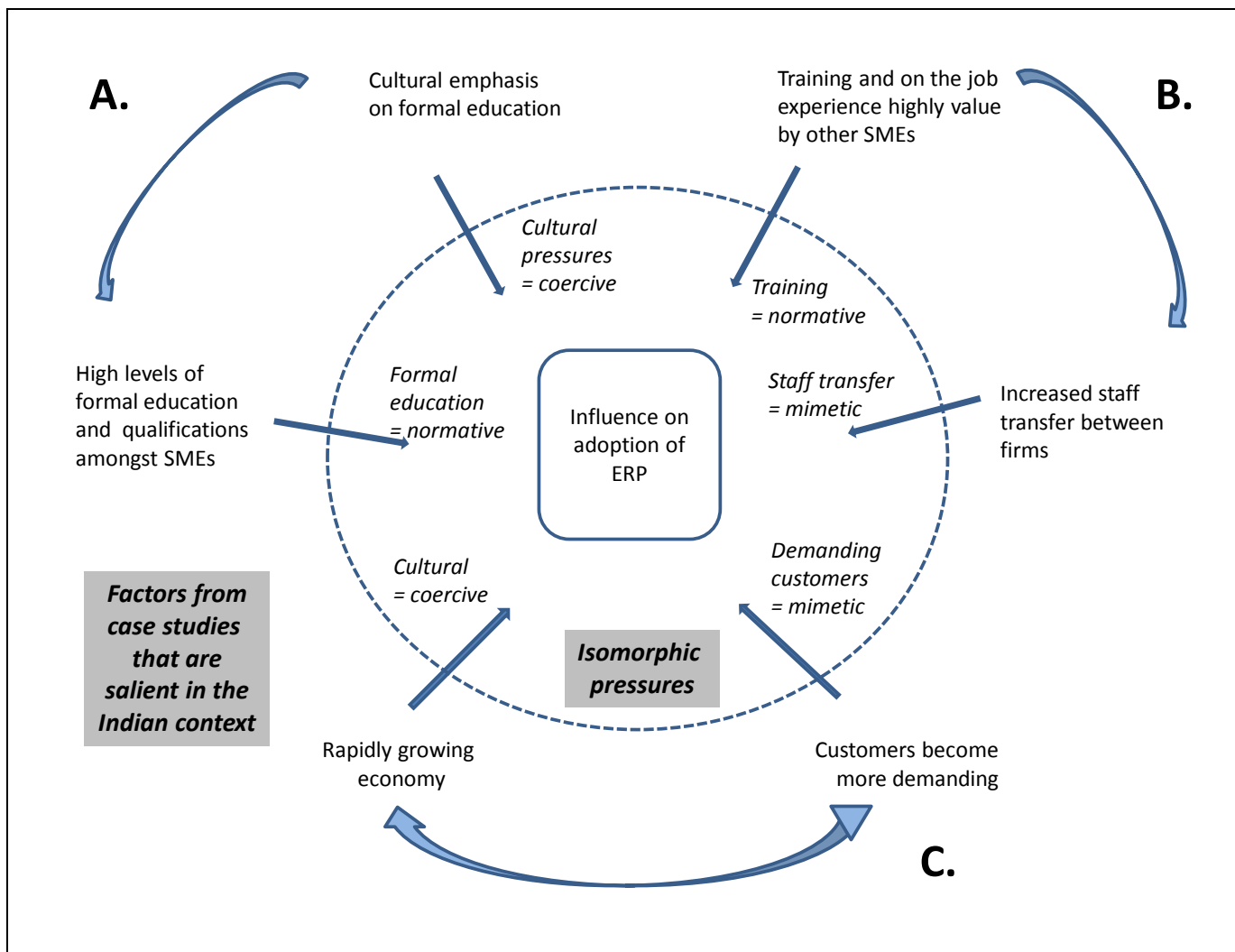


Figure 2. Isomorphic factors in the Indian context

Key: Outer circle shows factors identified in the Indian context; Inner dashed circle shows influence on isomorphic pressures

5. Discussion

Despite differences in size, sector and challenges, many firms, including those in India, have adopted ERP systems. It could be asserted that this is because they are the ‘best’ way of solving such a wide range of challenges. We do not seek to challenge if they are, or are not ‘best’ for the firms involved. Rather, our interest is in making explicit the full range of influences on the decision to adopt such systems. Only when all influences are made explicit can adoption rationales and decision making be fully understood.

Addressing our first research question has made explicit a range of factors that appear to contribute to the three types of isomorphic pressures. Whilst some of these factors are identified and explored in previous studies of IS adoption (e.g. Teo et al, 2003; Liu et al,

2010), to our knowledge, no previous study has set out the multiple and wide range of antecedent factors in a particular contextual setting. The factors identified are summarized in Table 4. Recognizing these more detailed factors is important since they are at the level at which practitioners can take action and also at which academic studies can recognize and study isomorphic influences.

Table 4: Antecedent Factors of Isomorphism in ERP Adoption

| |
|--|
| Factors Contributing to Coercive Pressure |
| Government regulation |
| Influence of parent organization |
| Be able to work effectively with customers and suppliers |
| Powerful suppliers or customers |
| Rapidly growing economy |
| Emphasis on education |
| Respect for authority/experience of others |
| Factors Contributing to Mimetic Pressure |
| Visits to other firms |
| Board position in similar firms |
| Benchmarking – including operational aspects and benefits achieved |
| Consultants or vendors with experience of other SMEs |
| Consultants or vendors with experience in same industry |
| Consultants /vendors implementation partners with international experience |
| Increasingly demanding customers |
| Factors Contributing to Normative Pressure |
| Formal education |
| In-company training provided by vendors/implementation partners with SME, sector and/or international experience |
| Training on technical and broader education on impact on processes and performance |
| Training across a broad range of staff |
| Professional networks |
| Common job titles and career paths |
| Simple job titles |

Our second research question considers the geographical context of our study in greater depth. Whilst we have identified the factors summarized in Table 4 in the Indian context, they are not unique to this context. Indeed, a number of them have been considered in isolation in previous studies which were based in other locations (e.g. Pearson and Keller, 2009; Nicholson and Sahay, 2009). However, our case study findings suggest that a number of the factors are particularly important in the Indian context, this importance both arising from and causing inter-relationships and reinforcement between factors shown in Figure 2. Differing patterns of reinforcement provides the potential for significant differences in isomorphic influences across geographical contexts, hence supporting our premise of the need to explicitly recognize contextual influences in IS adoption studies.

6. Contributions to Theory

Identification of the detailed factors allows us to make a contribution to management theory by addressing some of the limitations identified in institutional theory. As noted, criticisms of institutional theory include that it positions managers as victims of exogenous pressures (Currie, 2009). Our explication of the antecedent factors contributing to the three high-level pressures addresses this limitation, helping to bring an agency perspective into both institutional theory and practice. In the case of institutional theory, conceptualizing the three high-level pressures at the level of the contributing factors, allows a consideration of which factors could provide an opportunity for agency and how might that agency be deployed.

The factors identified in Table 4 differ in their isomorphic transparency or explicitness. For example, employing vendors and consultants with experience in other firms in the same industry in order to learn accepted or common practice (Teo et al, 2003), may be relatively easily recognized as a means of becoming more like the other firms and hence is an activity where explicit managerial choice or agency would be expected. In contrast, the isomorphic nature of having standard job roles and titles to those found in other firms is not apparent. Exposing the isomorphic nature of such factors will enrich future exploration of IS adoption.

Prior literature has also suggested that institutional theory has a degree of conceptual ambiguity (Currie et al, 2009; Hasselbladh and Kallinikos, 2000). Our identification of the more detailed factors can allow differences between the causes and responses to isomorphic pressures to be teased out in instances where there appears to be ambiguity. For example, we have highlighted that our case studies suggested an interaction between the rapid growth in the Indian economy and the increasing wealth of many Indians, resulting in them becoming more demanding. We are aware that, superficially there is a high degree of similarity or overlap between firms responding to increased demand due to growth in the market and responding to increasingly demanding customers. However, drawing on the more detailed level of insight provided by our study, growth in the market leads to increased volume of demand (Christopher and Ryals, 2014), and results in the implicit coercive pressure to become more efficient. In contrast, demanding customers increase the volatility and complexity of the market, resulting in modeling and mimetic pressures to address uncertainty. Hence the more detailed view of isomorphic factors helps to address conceptual ambiguity associated with institutional theory.

7. Implications for Practice

As noted by Son and Benbasat (2007), identification of more detailed isomorphic factors is '*more managerially meaningful than merely identifying the ...main types of organizational motives*' (p.85). It is at the level of these detailed factors that managers can take action. For those seeking to model their practice on that of other firms, Table 4 suggests specific mechanisms that they can use. Whilst some of these may be well known, for example, the use of consultants, the richness and diversity of the factors shown in Table 4 allow the consideration of other mechanisms that can support adoption, such as recruitment practices and adopting standard job titles and role definitions. The factors appear self-reinforcing, and hence addressing more than one of them at a time can be expected to aid the adoption of the selected practices. Conversely, for those practitioners seeking to promote diversity, Table 4

can act as a checklist of factors to avoid if they wish to ensure that their firms are not unwittingly acting in ways that are likely to promote homogeneity with other firms.

8. Conclusions

Previous studies of the adoption of major IS by organizations have focused on technical and economic rationales (Shang and Seddon, 2002; Nah et al., 2003; Ahmad et al, 2014). The first contribution of this study is to augment these previous studies by empirically identifying influences that are social, cultural and structural in nature, hence providing a more complete understanding of the influences on adoption.

As has been noted, there has been little development of the three isomorphic pressures identified by DiMaggio and Powell (1983). We would contend that this is because most studies treat three pressures as monolithic entities, without exploring the rich and varied factors that contribute to them. Our second contribution is to go beyond the monolithic view and empirically elucidate the more detailed factors that contribute to the three high-level isomorphic pressures in the case of adoption of ERP systems by Indian medium-sized firms. Finally, our elucidation of the contributing factors makes a contribution to theory by addressing two limitations of institutional theory; a lack of agency perspective and a degree of conceptual ambiguity.

9. Limitations and Future Research

As with all studies, the limitations of this research should be recognized. Our focus on Indian medium sized firms allowed us to conduct our study in a context in which firms were experiencing a range of pressures. However, whilst firms in other locations may experience the same three high-level isomorphic pressures, these may be influenced by different detailed factors to those shown in Table 4, or those factors may interact in different ways than shown in Figure 2. Future studies should explore the multiple and detailed isomorphic factors operant in different contexts, allowing a comparison between contexts.

This study did not seek to link the adoption of the ERP systems studied and the success of those systems. We recognize that there are multiple interpretations of success and means of measuring success in IS (DeLone and McLean, 2003; Stacie et al, 2012). Future studies could link the range and interaction of factors that an organization is exposed to and the influence that these appear to have on the success of their implementation and use of IS.

Our findings suggest that similar isomorphic factors were operating both within and across the varied industries that our case studies were drawn from. In order to provide even greater understanding of the processes of isomorphism, further research could determine if, and why, certain factors were more common or had greater impact in certain industries, or if certain

factors were more effective at inter-industry isomorphism compared to intra-industry isomorphism.

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Appendix 1: Topics for Discussed During Interview

Interviewee details (role, title, tenure, role in ERP adoption..)

Company details (sector, size..)

ERP system adoption (date started and finished, vendor, modules...)

Where did the idea for ERP come from/how arose?

Why did you think an ERP would be beneficial for your firm?

Who lead or championed ERP adoption – what was their rationales for or influences on adoption?

How or where did you get information about ERP and what it could offer your firm?

Were there any other influences that shaped or contributed to your firm’s adoption of ERP?

Were you influenced by outside parties? (government, suppliers, buyers, parent..)

Did you take advice on the reasons to adopt ERP? (vendors, consultants, others...)

Did your staff have formal qualifications or attend training relating to ERP/IT?

Have you recruited staff that know about ERP? Where are they recruited from and why?

Appendix 2: Exemplar Quotes from Interviews

| Isomorphic Pressure | Exemplar Quotes from Interviews |
|---------------------------|--|
| Coercive Pressures | |
| Formal regulation | In the pharmaceutical industry, tracking of the entity is very important; suppose a batch number of medicine needs to be traced....ERP can give us this type of output. (Executive, case study 4). |
| Parent organisation | The idea came from the parent company in Germany... So, Germans very much believe in systems...If you don’t have any systems, you can’t run your organization well...(IT Manager, case study 4). |
| Pressure from customers | Under the Just in Time (JIT) concept, the seating units must be delivered to the assembly lines of the manufacturer to a strict timetable. To a great extent the delivery of seating systems on a JIT basis has been possible through successful ERP implementation. (IT Manager, case study 1). |
| Rapid market growth | Our company is going through a growth phase- our turnover has increased almost 50 per cent in the last two years. (Director of Finance, case study 6) |
| Mimetic Pressures | |
| Modeling on other firms | Our Chairman was also more interested in going for the same ERP, because it had given good results to [other firm name] (IT Manager, case study 5) |
| Benchmarking against | Our vision is to become a world class IT enabled manufacturing |

| | |
|--|--|
| other firms | company....We have some specific goals to achieve that vision, like benchmarking particular industries for ERP implementations and adopting world class IT solutions and best practices in the world, like ERP. (Chairman, case study 2). |
| Vendor, implementation partner or consultant influence | ..I attended a lot of seminars by software companies like SAP, BAAN...Oracle. We went for Oracle as they have implemented in more companies of our size. (Head of IT, case study 3). |
| Wide base of or demanding customers | Customers always want something new ...the shelf life of a product is very, very small..... so that if the demand is there at another location, we can always take the inventory from that location and switch it to another location. (IT Manager, case study 5). |
| Normative Pressures | |
| Training | All the users attended training everyday so we could learn from the vendors how to use ERP. I am from the finance department and I was given functional training not only relevant to my finance department but also how the ERP system will be linked with other departments' business processes. (Executive Finance, case study 1) |