Open Research Online
The Open University's repository of research publications
and other research outputs

Isomorphic processes in ERP adoption by Indian medium-sized firms

Conference or Workshop Item

oro.open.ac.uk

Isomorphic Processes in ERP Adoption by Indian Medium-sized Firms

Dr Seema Sharma
University of Bedfordshire Business School, Luton, UK
Email: seema.sharma@beds.ac.uk

Professor Elizabeth M. Daniel
Open University Business School, Milton Keynes, UK
Email: E.M.Daniel@open.ac.uk

Abstract

This study adopts an institutional theory perspective of the adoption of ERP (Enterprise Resource Planning) systems by medium sized firms in India. The study contributes to the understanding of the operation of the three isomorphic pressures: coercive, mimetic and normative, in the adoption of IS by moving beyond the common view of these as 'monolithic entities'. The study is undertaken by means of nine qualitative case studies. The research makes three contributions. Firstly, the study shows the complete range of mechanisms by which the three isomorphic pressures act within and across organisations. Secondly, our findings contribute to aiding the conceptual clarity of parts of institutional theory, by explicating areas of overlap and coalescence of the three macro-level pressures. Finally, our elucidation of processes and mechanisms are of value to practitioners and policy makers, since it is at the level of these processes and mechanisms that individuals and groups can most readily and easily take action.

Keywords: ERP, institutional theory, isomorphism, India, SMEs, medium sized firms

Isomorphic Processes in ERP Adoption by Indian Medium-sized Firms

Abstract

This study adopts an institutional theory perspective of the adoption of ERP (Enterprise Resource Planning) systems by medium sized firms in India. The study contributes to the understanding of the operation of the three isomorphic pressures: coercive, mimetic and normative, in the adoption of IS by moving beyond the common view of these as 'monolithic entities'. The study is undertaken by means of nine qualitative case studies. The research makes three contributions. Firstly, the study shows the complete range of mechanisms by which the three isomorphic pressures act within and across organisations. Secondly, our findings contribute to aiding the conceptual clarity of parts of institutional theory, by explicating areas of overlap and coalescence of the three macro-level pressures. Finally, our elucidation of processes and mechanisms are of value to practitioners and policy makers, since it is at the level of these processes and mechanisms that individuals and groups can most readily and easily take action.

Keywords: ERP, institutional theory, isomorphism, India, SMEs, medium sized firms

Introduction

Many extant studies of the adoption of information systems (IS) adopt the premise of the rational agency of individual managers (Jeyaraj and Sabherwal, 2008). This study provides a complementary perspective by considering the complex range of pressures arising from social, economic and political sources that also contribute to the adoption of IS.

The study adopts the particular research context of the adoption of specific large scale IS, ERP (Enterprise Resource Planning) systems, by medium sized firms in India. It is well documented that the economy in India is growing rapidly (Ramakrishna, 2011; Golley and Tyers, 2012), fuelled both by domestic production and production for global export. In order to compete in both these spheres, firms in India have both sought themselves to adopt IS and also been encouraged to adopt such systems (Madon et al, 2009). Small and medium sized enterprises (SMEs) are a vital part of the economic growth of India. For example manufacturing SMEs produce approximately 40% of manufacturing output of India (Sharma and Ali, 2010; Dixit and Pandey, 2011).

Institutional theory suggests that due to their operational context, institutions are exposed to three isomorphic pressures that encourage firms to adopt similar structures and practices, which includes the adoption of IS. Despite having been three decades since these isomorphic pressures were conceptually elucidated, there has been little empirical investigation into how these pressures operate at the level of organisational and inter-organisational processes and mechanisms. Synthesis of extant literature suggests that the isomorphic pressures will be operant through a rich and varied set of processes and mechanisms (e.g. Currie and Guah, 2007; Nicholson and Sahay, 2009; Rajão et al, 2009). However, the limited set of previous empirical studies that consider institutional processes, only consider a narrow range of processes, often focussing on one or two processes or mechanisms (e.g. Teo et al, 2003).

This study addresses these impoverished views of the operation of isomorphic pressures, by seeking to identify the full rich and varied set of organisational and inter-organisational processes and mechanisms through which the pressures appear to operate in the chosen research context.

The paper commences with a discussion of institutional theory and its application in the IS domain. This is followed by a description of the case study methodology adopted for the empirical investigation. The findings from the nine case studies undertaken are discussed in terms of the processes and mechanisms through which the isomorphic pressures were found to operate. The paper concludes with a discussion of the findings including the implications for practicing managers. The limitations of the current study and opportunities for further research are also presented.

Institutional Theory and its Application in IS Research

Institutional theory recognises that organisational structures and practices are influenced by the existence and operation of institutions in an industry or country, where institutions include the legal system, governance mechanisms, capital markets, other organisations and cultural and professional norms.

Reviews of the use of institutional theory in IS have been undertaken by Weerakkody et al (2009) and Mignerat and Rivard (2009), both of which were published in a special issue of the Journal of Information Technology (Currie et al, 2009) focussing on this topic. 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 53 studies of institutional theory applied to the IS/IT domain over a period of 20 years, confirming the observation that the application in the IS domain is still relatively nascent. These authors find that whilst the majority of studies consider the effect of institutionalism on the adoption and diffusion of IT, only a minority of studies consider the processes by which that institutionalisation is operant or is enacted.

Criticisms of institutional theory include its lack of an 'agency' perspective, as it positions managers as victims of exogenous pressures (Currie, 2009). More recent studies have sought to understand how and why agency plays a part in altering institutionalized patterns of behaviour (Garud et al, 2002; Deejan et al, 2004; Garud et al, 2007). Other criticisms include the 'conceptual ambiguity' in key concepts noted previously (Hasselbladh and Kallinikos, 2000; Currie et al, 2009).

Institutional Isomorphism

One strand of institutional theory suggests that the institutions in a given context will cause organisations to adopt similar structures and practices and, hence, over time, the organisations will tend to become similar or isomorphic (Meyer and Rowan, 1977; Scott, 2007; Zucker, 1987; Hoffman, 1999).

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 high level pressures which lead to isomorphic change: coercive, mimetic and normative. Although their work was carried out almost three decades ago, the three categories 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. Teo et al, 2003; Lai et al, 2006; Son and Benbasat, 2007).

Coercive pressures are associated with informal or formal pressures. Informal pressures may arise 'from cultural expectations in the society within which the organisations function' (DiMaggio and Powell, 1983, p.150). Coercive pressures may also arise from the need to meet formal government regulations, such as pollution controls, tax and accounting regulations. The effect of coercive pressures have been included in a number of studies of the adoption of IS, particularly inter-organisational information systems (IOS) which usually rely on the adoption of the system by both a supplier and their customer. Son and Benbasat (2007) found that coercive pressures did not contribute to adoption of B2B e-marketplaces. They explained this contrast with findings relating to the adoption of EDI by noting that the latter was oriented towards supporting existing relationships between buyers and suppliers and hence prone to the influence of a known trading partner. Whilst we would not disagree with this difference, we would also observe that these authors only included a single mechanism (perceived dominance of supplier) in their measurement of coercive pressures.

Mimetic isomorphism arises from uncertainty. Based on earlier studies, DiMaggio and Powell (1983) argue that when conditions are uncertain, owing, for example, to rapid technological or market change, firms will manage this uncertainty by imitating what other, seemingly successful or legitimate firms are doing. They refer to this behaviour as 'modelling' (a firm models itself on other firms). Modelling can act through a number of mechanisms including recruiting employees from the other firms, using consultants, participating in industry associations and outsourcing (Pearson and Keller, 2009). Mimetic pressures have been found to be important in the adoption of IS systems. For example, Lai et al (2006) find that what they refer to as 'mimesis' contributes to the adoption of radio frequency identification (RFID) in the supply chain and set out the challenges and opportunities this pressure give rise to.

Normative isomorphism arises from professionalisation. Following Larson (1977) and Collins (1979), DiMaggio and Powell (1983) described professionalisation 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 legitimisation for their occupational autonomy' (p.152). Two particular mechanisms of normative isomorphism are identified: professional networks and formal education. 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 centralisation (Pearson and Keller, 2009) the latter of which is often a feature of IT departments in SMEs.

The three isomorphic pressures and the mechanisms identified in previous studies through which they operate are summarised in Table 1. As noted previously, review and synthesis of the literature, as presented here, suggest that the three types of pressure operate through a rich and varied set of mechanisms. However, extant empirical studies do not reflect this richness and diversity, instead focussing at the macro-level or on a narrow sub-set of processes and mechanisms. Our study addresses this gap in previous empirical studies through addressing the research question: through what organisational and inter-organisational processes and mechanisms do isomorphic pressures operate in the case of adoption of ERP systems by medium sized manufacturing firms based in India?

Isomorphic Pressure	Processes and Mechanisms
Coercive Formal and informal pressures such as government regulations or local culture	Local culture Government requirements Requirements of funders Influence of parent organisation on subsidiaries Need to mirror other organisations in order to interact easily
Mimetic Arising from uncertainty – firms will imitate other firms that appear successful or legitimate	Employee transfer Consulting firms Industry associations Wide or demanding customer base
Normative Arising from professionalisation, particularly of functional fields	Formal educational programmes Training Professional networks and trade associations Recruitment practices, e.g. from the same universities or the same firms Legitimacy of key firms in industry Common career titles and paths

Table 1: Isomorphic Pressures, Processes and Mechanisms

Research Methods

As identified by Weerakkody et al (2009) in the literature review of institutional based studies, extant studies tend to be positivist, quantitative studies. This contributes to the high-level, macro consideration of the three isomorphic pressures. Since our study was interested in the processes and mechanisms at a more detailed level, and we did not wish to pre-specify or limit the number and nature of the processes identified, we adopted a qualitative method based on case studies (Eisenhardt, 1989; Hoskisson et al, 1999).

Sampling and Data Collection

A multiple case study approach was adopted in order to increase the analytical generalisation of the study findings (Yin, 2003). In order to provide a degree of analytic replication all firms were drawn from the manufacturing sector and all firms studied were medium sized (between 150 and 300 employees). Nine case studies were undertaken, which are summarised in Table 2. The nine case studies spanned five manufacturing sectors, allowing a degree of both replication and generalisation. Nine cases also allowed a balance between data overload and the analytical generalisation sought by the study. The appropriateness of nine cases was demonstrated by 'saturation' and 'consistent regularities' being achieved during data analysis (Miles and Huberman, 1994, p.62).

Within the majority of the case study organisations, interviews were carried out with three individuals who had played a key role in the ERP implementation. In most cases these were: the Chairman, CEO or other senior manager; the IT Director or Manager, who in most cases also acted as the project manager for the ERP implementation, and a business executive that represented users within the organisation. As shown in Table 2, a total of 27 interviews, which lasted from one to four hours, were undertaken across the nine case study firms.

Case	Number of employees	Industry	Interviewees	Interview location
Firm 1	300	Car parts	3	Haryana, India
Firm 2	200	Automobiles interiors	3	Haryana, India
Firm 3	150	Car steering system	2	Haryana, India
Firm 4	300	Medicines	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	

Table 2: Case study firms and interviewees

Consistent with other case-based research, interviews were guided by a semi-structured interview schedule. The interviewer was alert to descriptions of the processes and mechanisms identified in Table 1, and prompted the interviewee if they did not mention certain mechanisms. However, the list was not viewed as exhaustive and the narrative based approach ensured that further processes or mechanisms could be self-elicited by respondents during their narrative responses.

Whilst the researchers reflected on each case study as it was undertaken, all nine case studies were completed before formal analysis was undertaken. Whilst it is recognised that 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.

Data Analysis

The interviews were recorded and fully transcribed. Interviews were conducted in the local language and transcriptions were translated into English. The translated transcripts were coded using tabular layouts in a word processing package. Consistent with the semi-structured interview guide, initial codes were the processes and mechanisms identified in Table 1, that is initial coding was deductive in nature. In addition to the predefined codes, an opportunity for additional codes, and

reformulation of initial codes was allowed for during analysis (Dey, 1993), that is there was an opportunity for inductive coding from the narrative responses. Intra-case coding was first carried out on each of the nine case studies. The codes were then compared across the case studies. There was a very high degree of consistency and hence the coded data were combined across the cases. Coding was undertaken by one researcher and then independently assessed by the other researchers involved. Inter-coder reliability was high, but where differences occurred these could be resolved by looking at the text in its fuller context.

Internal and External Validity

As described above, internal validity was increased by interviewing and combining data from multiple interviewees with differing roles in their firm's adoption. Internal validity was also increased by using multiple researchers in the data analysis process. External validity and generalisation was addressed by undertaking multiple case studies (Yin, 2003).

Findings

Isomorphic Processes and Mechanisms

The isomorphic processes and mechanisms that were identified in the case studies are discussed below, according to the type of isomorphic pressures to which they relate.

1. Coercive Pressures

The case study firms were subject to a number of coercive pressures, 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. These pressures operated through a range of mechanisms or practices which all contributed to the adoption of the ERP system by the case study firms.

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:

In the pharmaceutical industry, tracking of the entity is very important; suppose a batch number of medicine needs to be tracked....ERP can give us this type of output. (Executive, case study 4).

Parent organisations 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 idea came from the parent company in Germany... this is a German company. So, Germans very much believe in systems...If you don't have any systems, you can't run your organisation well...(IT Manager, case study 4).

The need for firms in certain industries to work closely with suppliers or customers is another mechanism through which coercive isomorphic pressures can operate. Whilst these do not have the legal weight of government regulations, large and powerful suppliers or customers can exert considerable influence over how they wish to interact and trade with small or medium-sized firms in the industry (Chwelos et al, 2001; Teo et al, 2003). Both case study firms 1 and 2 manufacture car parts that for large car manufacturers. In order to be suppliers to these manufacturers, they were required to be able to supply parts according to strict delivery schedules in order to meet the just in time (JIT) manufacturing model of the manufacturer. This need to be able to meet the requirements of their customers had resulted in their adoption of ERP systems. For example, the IT manager in case study firm 1 described:

To a great extent the delivery of seating systems on a JIT basis has been possible through successful ERP implementation. The information on a real time basis was required by us to be able to optimize the complex seating production processes to get on time and increased productivity. (IT Manager, case study 1).

Less formalised coercive pressures arising from the Indian context in which the firms were operating were evident in the case study firms in two ways. Firstly, a number of the firms described how their firms were growing rapidly due to increased demand for their products within both the domestic and export economy. This rapid growth required them to find ways of addressing that growth in efficient ways, such as by the introduction of IT systems. For example, both of the firms that manufactured cables described how they had been experiencing increased demand for their products:

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... (Director, case study 8).

As will be discussed in relation to normative isomorphic pressures, the Indian government has placed considerable emphasis on formal education as a means of economic development. Consistent with this, many Indian families also see education as a means of social mobility and improving their standard of living and hence are willing to invest in the education of their children (Thatchenkery et al, 2004; Golley and Tyers, 2012). Whilst this is leading to a dramatic increase in the number of graduates, many of these graduates want to work in large companies, where they perceive there are greater opportunities. The medium sized firms, which were the focus of the present study, reported experiencing severe shortages of experienced IT staff that could be involved in the ERP adoption. They also reported that when they could find such staff or when their own staff gained experience of ERP, they were often left to take up jobs in other companies. For example:

...part of the problem that comes with ERP is once people are trained in ERP they have a high market value and they leave. As a result you have nobody and then you have to start again to look for a replacement. During implementation we did faced this problem but later on sustaining ERP experts is a major concern that I think most organisations face. (Chairman and Managing Director, case study 3).

…There was no choice of team as there are not enough people with IT skills. People working with us left the company so finding replacements who can take the place of these people was difficult… (Manager, case study 9).

Whilst the hiring of employees from other firms is often characterized as a mechanism by which to address mimetic pressures, we would argue in this case, that the rapid transfer of staff between organisations is coercive in nature. That is, it is particular characteristics of the Indian context: the rapid growth in the Indian economy and the shortage of experienced IT professionals, are causing staff to move quickly between organisations. Once in post in a new organisation, they will tend to share the experiences and ideas they were exposed to in previous firms, leading to increased isomorphism.

2. 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 modelled themselves on what they could observe or learn from other firms. For example, the IT manager in firm 1 stated:

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 mechanisms used to achieve this modelling included benchmarking against firms in the same industry and also firms in other industries that were considered to be leading exemplars of ERP use and efficient operation:

Our vision is to become a world class IT enabled manufacturing 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).

In the case of firm 3, which manufactured car parts, the Chairman described how he was a Board member of another medium sized company. He had 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).

As well as deriving the overall idea for ERP adoption from other firms, some of the case study firms described how they had sought to learn about the detailed operations of the ERP systems within other firms, for example by visiting other firms and observing the systems in use, and also the benefits that other firms were achieving from their ERP systems:

We visited other organisations to see how they work on their ERP system. (Chairman and Managing Director, case study 3).

….in fact Imaging Pro was running in DCM. Our Chairman was also more interested in going for the same ERP, because it had given good results to DCM (IT Manager, case study 5).

Vendor and implementation partner selection was seen by the case study firms as another important mechanism through which they could model themselves on other companies had adopted ERP. For example, firm 1 had a failed attempt at implementing an ERP system before the implementation that was included in the present study. Their previous failed attempt was with a local vendor. A decision was made to select an international ERP vendor for the second implementation, because they believed such a vendor would have greater experience of implementing ERP in other firms from which they could learn and on which they could model themselves. Case study firm 3 described how they carefully selected their vendor, after attending presentations by a range of vendors, based upon the vendor's previous experience of working with small and medium sized companies. Firm 3 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. This was described by the Head of IT:

..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).

Firm 4 chose its ERP vendor after comparing certain parameters across the market leaders. The parameters emphasised the prior experience of the vendors, in particular their experience and hence knowledge of the pharmaceutical industry, which they believed would allow them to be able to adopt similar practices to pharmaceutical firms they perceived to be successful.

In addition to the selection of software vendors that would allow the case study firms to model themselves on other firms, most of the case study firms used consultants or implementation partners to help them with the configuration and implementation of the ERP systems and in most cases, to provide training for staff. These consultants and partners were also selected so that the case study firms could learn from their experiences with previous clients. In particular, case study firms 1 and 2 were keen to stress that they did not believe that domestic consultants would have sufficient experience they could learn from, and hence were keen to appoint international consultants:

We used the services of international consultants after observing first time implementation failure with a local consulting firm. (IT Manager, case study 1).

We used the services of international consultant as we knew other firms that used services of international consultants and were successful in ERP implementation process. (Chief Information Officer, case study 2).

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). The two case study firms that produced clothing both emphasised how they have had to find ways of meeting the increasing demands of their customers. Case study firm 5 sold their products directly to consumers and described how the data warehouse in their ERP system allowed them to identify where stock was being held across their multiple stores:

…suppose you are sitting in Delhi, we have a number of shops in Delhi, so every shop can log in into the central data warehouse...if the inventory has finished in that particular shop, we can always refer to the second shop, I mean either ask customer to go to that shop or he can always ask for that product to be sent to his nearest store... (IT Manager, case study 5).

As discussed in the previous section, pressure from powerful customers or suppliers is viewed as coercive in nature. In contrast, copying from others is viewed as mimetic. Descriptions from respondents in case study firm 1 appeared to coalesce these two isomorphic pressures:

Our customer's demanding nature in terms of use of latest IT applications in business operations forced the firm to adopt ERP as it was also being adopted by similar kind of firms during that period. (ERP Implementation Manager, case study 1).

This coalescence is considered further in the discussion section of the paper.

3. Normative Pressures

A key mechanism in normative processes is formal education. Prior literature suggests that the effective adoption and implementation of large scale IT systems, such as ERP systems, requires a blending of both IT and management knowledge. Hence, Table 3 shows the higher education (HE) qualifications in the areas of 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. This is consistent with the earlier observation that many families and individuals within India hold education and the achievement of formal qualifications in high regard (Thatchenkery et al, 2004; Golley and Tyers, 2012).

Case	Chairman/CEO/Senior Manager	IT Director/IT Manager/Technical Advisor	Business Manager/Executive
Firm 1	Masters degree (IT & 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

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

In addition to formal education, more informal education, such as provided by in company training and executive education provided to individuals whilst undertaking their professional roles is also an important mechanism for the propagation of normative isomorphism. All of the case study firms provided training in the use of the ERP system to their users. However, there was a difference across the case study firms in who provided this training, who was given training and what training was provided. In case study firms 1 – 6, training was well planned, structured and systematic and involved use of an external implementation partner to provide training. These firms tended to train a wide range of staff and provided a range of training including general awareness raising and detailed training for specific roles. This wider reach and nature of the training provided greater opportunities for the normative influences to permeate the adopting firms.

In contrast, in firms 7 – 9, external partners were not used to undertake training mainly due to concerns about cost. Instead, a limited amount of training was given by

the firm's ERP implementation team based on what they had learnt about the system during implementation. These firms also tended to stress that training was limited to how users should input data into the system, rather than to provide a wider awareness of impacts and benefits that the system use could have on the processes or operation of the firm.

In addition to formal qualification and training, the case study firms sought to increase their understanding of ERP systems and their use in other firms by participating in professional networks. For example, the IT manager in case study firm 1 noted:

Senior staffs 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 a common theme when discussing professional networks, that is, it was usually only senior staff that participated in such networks. This reflects another aspect of the Indian context in which the study was conducted. Previous studies of cultural orientations have identified Indians as high on power distance measure (Hofstede, 1990; Marcus and Gould, 2000). In cultures with high power distance, there is a great respect for authority and it was seen as appropriate for only senior managers to participate in such networks. This prevented the exposure of a wider range of staff to the information available from such networks.

Finally, similar job titles and common career paths have also been seen as contributing to the formalisation and structuring of functional fields and hence a mechanism through which normative isomorphic pressures can act. 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 organisations where roles and titles are often specific to the organisation and less transparent to the outside world.

Discussion

The isomorphic processes and mechanisms that were identified in the case studies are summarised in Table 4. This table confirms the starting premise of this paper that is; the three isomorphic pressures are operant through a significant number of distinct processes and mechanisms.

Coercive
Government regulation
Influence of parent organisation
Be able to work effectively with customers and suppliers
Rapidly growing economy
Shortage of experienced IT staff willing to work in medium sized firms
Mimetic
Visits to other firms
Board position in similar firms
Benchmarking – including operational aspects and benefits achieved
Vendors with experience of other SMEs
Vendors with experience in same industry
Consultants / implementation partners with industry or SME experience
Demanding customers
Normative
Formal education
In-company training
Professional networks
Common job titles and career paths

Table 4: Isomorphic Mechanisms Identified

Elucidation of the full set of operant mechanisms allows for further consideration and understanding of the adoption of IS and the realisation of competitive advantage from IS. For example, the findings demonstrate that the isomorphic nature of some of the mechanisms is explicit, such as, employing consultants with experience at other firms in the same industry in order to learn accepted or common practice (Teo et al, 2003). The isomorphic nature of other mechanisms is more implicit, for example, recruiting staff with formal education qualifications. This implicit nature of some mechanisms suggests that whilst some modelling may be intentional, some of it may be unwitting.

Our findings also suggest that at the macro-level of isomorphic pressures, there appears to be overlap or coalescence, which gives rise to the criticism of the

'conceptual ambiguity' of parts of institutional theory (Hasselbladh and Kallinikos, 2000; Currie et al, 2009). As discussed, case study firm 1 appeared to be subject to both coercive and mimetic pressures. Consideration of the underlying mechanisms allows a clear distinction to be made: firm 1 experienced coercive demands from major customers to adopt IT systems and that these customers were influenced through consultants and other advisors to model their adoption of IT on the adoption of ERP systems by firms similar to themselves.

We next consider the Indian context of our study. A number of the mechanisms identified in Table 4, while not unique to the Indian context, are certainly made more pertinent due to that context. In particular, the rapidly growing economy has put considerable pressures on Indian firms to find ways to increase production whist being able to maintain relatively low costs. Similarly, the increased standard of living of some in India has made them more demanding customers. Both of these add to the dynamism and uncertainty in the economy and encourage firms to adopt mimetic approaches to address that uncertainty. Table 4 shows that the firms in our study adopted a wide range of mechanisms in order to affect this.

Other aspects of the Indian context appear to reinforce certain isomorphic pressures, making them more influential than they may be in other contexts. For example, as discussed in the section on normative pressures, many Indian families and individuals place considerable emphasis on formal education and the gaining of qualifications (Thatchenkery et al, 2004; Golley and Tyers, 2012). Hence, as shown in Table 3, there is often a high rate of individuals, even in small and medium sized firms, with formal qualifications in business and IT, and sometimes both. Formal qualifications tend to increase the professionalising of fields and hence the normative pressures that result from professionalization. Similarly the high power-distance measure of many Indians (Hofstede, 1990; Marcus and Gould, 2000) suggests a great respect for authority and senior managers are assumed to 'possess wisdom and are automatically esteemed' (Marcus and Gould, 2000, p.36). In such cases, if senior managers have been influenced to adopt ERP and other IT systems through their participation in professional networks or through involvement with other firms, then it will be difficult for subordinates to question that decision to adopt or to put forward alternative approaches.

Our findings showed that similar ERP systems were being adopted across the industries included in our sample. This similarity of adoption reflects that ERP systems are Type II systems in Swanson's (1994) typology, which are those systems are directed largely at the administrative processes and infrastructure of the firm, rather than systems that relate to products and services (Type III). Our findings also suggest that similar isomorphic mechanisms were operating both within and across these industries. However, we further research would be needed to determine if certain mechanisms were dominant or more effective in certain industries than others, or if certain mechanism were more effective at inter-industry isomorphism compared to intra-industry isomorphism.

Conclusions

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 mechanisms that contribute to the three macro-level pressures. This study has gone beyond the monolithic view and has empirically elucidated the range of processes or mechanisms through which institutional isomorphic pressures appear to act in the adoption of ERP systems by Indian medium-sized firms.

Son and Benbasat (2007) observe in their institutional theory based study that, '*identification of the specific factors contributes to theoretical knowledge in this area and is also more managerially meaningful than merely identifying the …main types of organizational motives*' (p.85). Our research addresses this observation and hence makes three contributions. Firstly, by providing data at a more detailed level than the three macro-level pressures, our study shows the mechanisms by which those pressures act within and across organisations. Secondly, our findings contribute to aiding the conceptual clarity of parts of institutional theory, by explicating areas of overlap and coalescence of the three macro-level pressures. For example, in the Indian setting of the study, the coercive nature of national culture, with its high regard for formal qualifications and respect for authority, is found to positively reinforce the

normative effects of formal qualifications. Finally, our elucidation of processes and mechanisms are of value to practitioners and policy makers, since it is at the level of these processes and mechanisms that individuals and groups can most readily and easily take action.

Implications for Practice

The findings of this study are particularly useful to practitioners who wish to adopt good practice, as well as those seeking to promote diversity of practices within their firm or across their industry. For those seeking to model their practice on that of other firms, Table 4 identifies 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 mechanisms 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 mechanisms 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 to ensure that their firms are not unwittingly acting in ways that are likely to promote homogeneity, for example, recruiting from a limited number of universities or former employers.

Limitations of Study and Further Research

As with all studies, the limitations of this research should be recognised. As discussed in the methodology section, a qualitative approach, which included an inductive stage, was adopted in order to reveal the rich and varied range of mechanisms through which isomorphic pressures might operate in the context studied. The intention was to achieve analytical generalisation rather than statistical generalisation. 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, which in turn were manifest in the range of mechanisms shown in Table 4. However, whilst firms in other developing economies or in developed economies may experience the

same three macro-level isomorphic pressures, these may operate through different mechanisms or through different combinations of mechanisms.

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

References

Chwelos, P., Benbasat, I. and Dexter, A. S. (2001) *Empirical test of an EDI adoption model*, Information Systems Research, 12 304-321.

Collins, R. (1979) The Credential Society, Academic Press, USA.

Currie, W. (2009) *Contextualising the IT artefact: Towards a wider research agenda for IS using institutional theory,* Information Technology & People, 22 63-77.

Currie, W. and Guah, M. W. (2007) *Conflicting institutional logics: a national programme for IT in the organisational field of healthcare,* Journal of Information Technology, 22 235-247.

Currie, W., Swanson, L. and Burton, E. (2009) *Special issue on institutional theory in information systems research: contextualizing the IT artefact,* Journal of Information Technology, suppl., 24 283-285.

Deejan, F., Gond, J-P. and Leca, B. (2004) *Measuring the unmeasured: An institutional entrepreneur strategy in an emerging industry,* Human Relations, 57 741-764.

DeLone, W. and McLean, E. R. (2003) *The DeLone and McLean model of information systems success: A ten-year update,* Journal of Management Information Systems, 19 9-30.

Dey, I. (1993) Qualitative Data Analysis: A User Friendly Guide for Social Scientists, Routledge, UK.

DiMaggio, P. J. and Powell, W. W. (1983) *The iron cage revisited – institutional isomorphism and collective rationality in organizational fields*, American Sociological Review, 48 147-160.

Dixit, A. and Kumar Pandey, A. (2011) *SMEs and Economic Growth in India: Cointegration Analysis,* IUP Journal of Financial Economics, 9 41-59.

Eisenhardt, K. M. (1989) *Building theories from case study approach,* Academy of Management Review, 14 532-550.

Garud, R., Jain, S. and Kumaraswamy, A. (2002) *Institutional entrepreneurship in the sponsorship of common technological standards: The case of Sun Microsystems and Java,* Academy of Management Journal, 45 196-214.

Garud, R., Hardy, C. and Maguire, S. (2007) *Institutional Entrepreneurship as Embedded Agency: An Introduction to the Special Issue,* Organization Studies, 28 957-969.

Golley, J., and Tyers, R. (2012) *Demographic Dividends, Dependencies, and Economic Growth in China and India,* Asian Economic Papers, 11 1-26.

Hasselbladh, H. and Kallinikos, J. (2000) *The project of rationalization: A critique and reappraisal of neo-institutionalism in organization studies,* Organization Studies, 21 697-720.

Haunschild, P. and Miner, A. (1997) *Modes of interorganizational imitation: the effects of outcome salience and uncertainty,* Administration Science Quarterly, 42 472-500.

Hoffman, A. J. (1999) *Institutional evolution and change: environmentalism and the US chemical industry,* Academy of Management Journal, 42 351-371.

Hofstede, G. (1990) Culture and organizations: Software of the mind. McGrawHill, UK.

Hoskisson, R. E., Hitt, M. A., Wan, W. P. and Yiu, D. (1999) *Theory and research in strategic management: swings of a pendulum,* Journal of Management, 25 417-446.

Jeyaraj, A. and Sabherwal, R. (2008) *Adoption of information systems innovations by individuals: A study of processes involving contextual, adopter, and influencer actions,* Information and Organization, 18 205-234.

Lai, K. H., Wong, C. W. Y. and Cheng, T. C. E. (2006) *Institutional isomorphism and the adoption of information technology for supply chain management,* Computers in Industry, 57 93-98.

Larson, M. F. (1977) The Rise of Professionalism: A Sociological Analysis, University of California Press, Berkeley, USA.

Madon, S., Reinhard, N., Roode, D. and Walsham, G. (2009) *Digital inclusion projects in developing countries: Processes of institutionalization,* Information Technology for Development, 15 95-107.

Marcus, A. and Gould, E. W. (2000) *Cultural Dimensions and Global Web User-Interface Design,* Interactions, 7, 32-46.

Meyer, J. W. and Rowan, B. (1977) *Institutionalized organizations: formal structure as myth and ceremony,* The American Journal of Sociology, 83 340-363.

Mignerat, M. and Rivard, S. (2009) *Positioning the institutional perspective in information systems research,* Journal of Information Technology, suppl., Special Issue on Institutional Theory in Information Systems, 24 369-391.

Miles, M. B. and Huberman, M. A. (1994) Qualitative Data Analysis: An Expanded Sourcebook, Sage Publications, USA.

Nicholson, B. and Sahay, S. (2009) *Deinstitutionalization in the context of software exports policymaking in Costa Rica,* Journal of Information Technology, suppl. Special Issue on Institutional Theory in Information, 24 332-342.

Pearson, A. M. and Keller, H. (2009) *Explaining web technology diffusion: An institutional theory perspective,* Communications of the Association of Information Systems, 25 593-606.

Rajão, R., Hayes, N. and Rajão, L. (2009) *Conceptions of control and IT artefacts: an institutional account of the Amazon rainforest monitoring system,* Journal of Information Technology, suppl., Special Issue on Institutional Theory in Information Systems, 24 320-331.

Ramakrishna, G. (2011) *India's Trade Policy: The Impact on Economic Growth, Balance of Payments and Current Account Deficit,* Journal of International Economics, 2 4-17.

Scott, W. R. (2007) Institutions and Organizations (3rd edition), Sage, Thousand Oaks, CA, USA.

Sharma, D. and Ali, M. (2010) *Framework for implementing flexible automation in Indian industries,* Global Business and Management Research, 2 208-223.

Son, J. Y. and Benbasat, I. (2007) *Organizational buyer's adoption and use of B2B electronic marketplaces: Efficiency- and legitimacy-oriented perspectives,* Journal of Management Information Systems, 24 55-99.

Stacie, P., DeLone, W. and McLean, E. R. (2012) *The Past, Present, and Future of IS Success,* Journal of the Association for Information Systems, 13 341-362.

Strauss, A. L. and Corbin, J. (1990) Basics of qualitative research: grounded theory procedures and techniques. Sage, USA.

Swanson, E. B. (1994) *Information systems innovation among organizations,* Management Science, 40 1069-1093.

Teo, H., Wei, K. and Benbasat, I. (2003) *Predicting intention to adopt interorganizational linkages: An institutional perspective,* MIS Quarterly, 27. 19-49.

Thatchenkery, T., Kash, D. and Stough, R. (2004) *Information technology services and economic development: The Indian experience,* Technological Forecasting and Social Change, 71 771-776.

Weber, M. (1952) The Protestant Ethic and the Spirit of Capitalism, Scribner, New York.

Weerakkody, V., Dwivedi, Y. K and Irani, Z. (2009) *The diffusion and use of institutional theory: a cross-disciplinary longitudinal literature survey,* Journal of Information Technology, suppl., Special Issue on Institutional Theory in Information, 24 354-368.

Yin, R. K. (2003) Case Study Research: Design and Methods, Sage, USA.

Zucker, L. G. (1987) *Institutional theories of organization,* Annual Reviews in Sociology, 13 443-464.