Responding to External and Internal Changes: Organizational Responsiveness
Pressures in Institutionalising ERP Systems

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Abstract—Organizational responsiveness is a critical factor for success of any business. It requires business organizations to understand and respond to changes in its external and internal environment. As a consequence, organizations are required to create a dynamic internal environment. This dynamism is built around exchanging information and ideas relating to business sustainability, progress, and growth. Enterprise technologies like ERP systems are becoming more popular among contemporary businesses. Implementation of these technologies is, therefore, engaged in conscious effort to develop internal capabilities, so as to use the same to address external challenges and to look similar to other evolving institutions. It is important that the organization continuously evaluates itself, to assess how it is going, what are the performance gaps (if any), how can it sustain its operations, and how should it grow both internally as well as externally. Being responsive, helps the organization to view every new technology investment as a mean to providing a coherent view of organizational information, allowing for informed decision making, and helping the organization to assess, learn, and grow. This paper, thus, opens up new research streams in institutional thinking by introducing organizational responsiveness as a new form of isomorphism among organization and other sub-institutions.

I. INTRODUCTION

Organizational evolution is a dynamic and iterative process of change that is shaped by the interaction of variety of organizational forces. In contemporary business paradigm, enterprise technologies such as ERP (Enterprise Resource Planning) system provide the foundation around which organizations evolve and mature. They not only aids organizations in enabling strategic business objectives through automation of operations, but with their information processing and decision support capabilities, these technologies also aid in business planning and management. Thus, the scope of these technologies extends from strategic enablers to strategic advisors. Implementation of ERP systems, thus, should not be viewed as one off endorsement of technology. It needs to be viewed as an on-going process of organizational learning and evolution through which ERP is institutionalised in the organization. In this way, ERP system establishes its legitimacy within the broader operating environment of the business ([8], [16], [25], [26], [31], [35], [40]).

Organizations aim to be responsive to internal and external changes to become competitive. Institutional logics guide social actions and legitimize organizational forms and managerial practices by providing assumptions and values about how to interpret organizational realities, what constitutes appropriate behaviour, and how to succeed. Organizational responsiveness pressure, i.e., a novel form of organizational isomorphism introduced in this paper, helps organizations to understand how and why they exhibit similarity and variation in the use of such forms and practices. This understanding is critical for tracing the relationship between organizations and the logic that constitutes their institutional context ([3], [11], [17], [31], [38]). This form of isomorphic mechanism helps organizations to satisfy and comply with its aims, vision, conditions, and future organizational demands by continuously addressing internal as well as external challenges. This paper describes two case studies of ERP adopting organization in Australia to show how organizational responsiveness isomorphism leads to successful institutionalisation of ERP systems within the organization.

The remainder of this paper will flow as follows. The next section reviews literature on ERP assimilation and institutionalisation process followed by an in-depth overview of institutional theory and isomorphic pressures. The following section introduces a new form of isomorphic pressure, i.e., organizational responsiveness. Two case studies of Australian ERP adopting organizations are then discussed to show how organizational responsiveness mechanism affects institutionalisation of ERP systems. The final section concludes research contributions and implications.

II. ASSIMILATING AND INSTITUTIONALISING ERP SYSTEMS

In the normal progression of events, firstly the technology is implemented. Then, it is assimilated in the organization and once its usage becomes routinized and embedded within the organizations’ work processes and value chain activities, it leads to successful institutionalisation. ERP assimilation, however, refers to the diffusion of ERP usage across organizational business processes and the routinization of activities within these processes. Once the organization is making optimal advantage of ERP, its use will be taken for granted by the organizational stakeholders to contribute to the value of the organization. This taken-for-grantedness to provide value in day to day operations results in institutionalisation of the ERP system ([21], [24], [26]). Reference [1] introduces a five stage ERP assimilation process called ERP life cycle starting from awareness for the need of ERP implementation to selection of appropriate package, preparation, implementation and finally operation. Most of the researchers more or less agree to theses stages.
III. INSTITUTIONAL ISOMORPHIC PRESSURES

Institutional theory has been applied to technology management paradigm by researchers ([4], [6], [7], [17], [28], [31], [44]). Activities involved in development and use of technologies in general and ERP systems in particular are subject to social, cultural, organizational, technical, and other institutional factors. These factors could be from external sources such as competitors, suppliers, customers, and regulatory agencies as well as by legitimate forms, practices, and logics embedded within the organization. Organizations may respond to these forces by conforming to technology mandates, or modifying their business practices to absorb the technology within the technical as well as organizational infrastructure. In doing so, organizations address the opportunity of social approval and/or legitimacy within the industry as well as target market. Individuals as well as groups within the organization have a profound role in achieving this social approval and legitimacy, for organizations are viewed as independent variables influenced not only by direct consequences of individuals’ attributes and stakeholders motives, but also by cognitive and cultural explanations which are continuously reproduced through the socialization process ([8], [22], [31], [35], [38], [44]).

Theories related to institutionalisation of technology are focused on macro as well as micro level. At the micro-level, institutionalised behaviour is reproduced as a result of institutionalisation. This behaviour is constructed socially and become stabilized over the period of time. However, with the proceed of time, the social background which led to the emergence of that behaviour will be forgotten, as a result of discontinuous and incremental change process ([6], [7], [17], [35], [42], [46]). Reference [45] uses micro level thinking to define three stages of technology institutionalisation, i.e., habitualisation (the production of shared social meanings), objectivation (facts become independent as a reality experienced in common with others), and sedimentation (objectified facts become part of routine behaviour).

At the macro level, external and environmental characteristics are considered as the main conduits of institutionalised behaviour. Coercive, normative, and mimetic are three isomorphic mechanisms through which organizations shape, maintain, and transform their social rules, ideals, and practices by aligning themselves with the environmental conditions ([7], [9], [27], [35], [38], [46]). These institutional pressures push organizations to adopt shared notions and routines. Thus, the interpretation of intention to adopt technology and the prevailing context of the organization is affected by its perception of these pressures ([7], [9], [17], [27]). According to reference [35], institutions are social structures composed of cultural-cognitive, normative, and regulative elements that, together with resources and associated activities, bring stability and meaning to organizations’ social life. Cultural-cognitive elements are based upon beliefs and taken-for-granted assumptions. Regulative elements involve conformity
The coercive isomorphism occurs by organizational desire to conform to laws, rules, and sanctions established by institutional actors or sources. This similarity results in reducing uncertainty, improving predictability, and benchmarking organizations which are performing at or near optimum level ([9], [24], [35], [38]). Organizations that are structurally equivalent and have similar economic network position, similar goals, and products are more likely to imitate each other. In fact, organizations mimic because they anticipate similar benefits. Therefore, when an organization adopts technology, competitors from the same industry become aware of its advantages and consider adopting it ([20], [35]). However, it is conceptually not clear whether organizations mimic other organizations to gain legitimacy in technical terms or for economic advantage [37].

The mimetic isomorphism is a cause of organizational tendency to remain similar to its peers in order to get positive evaluation from the industrial environment. This mechanism results in reducing uncertainty, improving predictability, and benchmarking organizations which are performing at or near optimum level ([9], [24], [35], [38]). Organizations that are structurally equivalent and have similar economic network position, similar goals, and products are more likely to imitate each other. In fact, organizations mimic because they anticipate similar benefits. Therefore, when an organization adopts technology, competitors from the same industry become aware of its advantages and consider adopting it ([20], [35]). However, it is conceptually not clear whether organizations mimic other organizations to gain legitimacy in technical terms or for economic advantage [37].

The normative mechanism mostly concerns the moral and pragmatic aspects of legitimacy by assessing whether the organization plays its role correctly and in a desirable way. It can refer to the positive pursuit of valued ends, as well as negative deviations from goals and standards [35]. The progressive use of IT in an organization could be viewed as the result of normative influences, such as, ATM service which is a standard service offered by retail bank. The banks who do not offer this service are at the risk of damaging their legitimacy within the industry as well as with other institutions that they interact. Normative pressures evolve through organization-supplier and organization-customer inter-organizational channels as well as through other trading partners, and professional and industry institutions ([9], [24]). For instance, the frequency of technology usage among an organization’s suppliers and customers may make decision makers aware of the technology and contribute to the organization’s inclination to adopt it. Furthermore, compliance with norms with respect to environmental concerns can lead to profitability, e.g., reducing organizational cost by conforming to an industrial standard resulting in reduction in wastage of efforts, time, and resources ([8], [19], [22], [31], [35], [46]).

IV. ORGANIZATIONAL RESPONSIVE PRESSURE

Responsiveness is the element which helps organizations to be competitive. This pressure forces the organization to continuously evaluate itself, so as to be able to quickly reconfigure itself to detect market changes, meeting new market demands, and share knowledge across organizational borders by taking maximum advantage of information processing ([3], [11], [15], [26], [41]). It is a result of organizational desire to develop a technical solution which has the ability to respond quickly to changes in the external environment of the organization as well as future organizational scalability requirements. Organizational learning is the core characteristic of organizational responsiveness which refers to the ability of organization to learn from past experiences and grow accordingly. A learning organization builds upon the lessons learned from past experience and creates new knowledge that equips the organization to respond to internal as well as external challenges ([30], [32], [36]). This does not just mean
extracting the information/knowledge from organizational memory; in fact it entails massive changes in the organization. These changes aim at educating, enlightening, and training individuals on preserving, using, and exploiting organizational tacit as well as explicit knowledge ([30], [32], [41]). Organizations, therefore, are more inclined to implement information technologies which could support learning process, provide repositories for knowledge, and enabling technologies that help capture, transfer and manage the tacit as well as explicit knowledge [33].

ERP implementation, however, is not one-off endorsement of technology; in fact it is a continuous process of mapping organizational requirements with technology. This means that the more capable an organization is in responding to the fast changing business information requirements and in managing organizational knowledge; the more likely that the ERP implementation will achieve all the objectives set for its implementation. This obviously means that the organization has to make use of the existing tacit as well as explicit knowledge to be able to consolidate its competencies and be able to learn from its previous technology implementation mistakes, so as to accommodate the new technology properly within the organization [41]. The inability of organization to understand its strength and weaknesses develops rigidities of various kinds in the organization, i.e., process rigidities, technology inflexibilities, and employee as well as organizational attitudes. Reference [15] terms ‘resource and routine rigidities’ as the major hurdle in changing resource investment patterns and organizational processes. Reference [13] extends the argument further and posits that if the organization does not have the ability and/or willingness to overcome resource and routine rigidities, it is unlikely to adopt and assimilate any standard relating to technology in the organization. The ability of the organization to overcome routine rigidities is even more important because they represent the repetitive reconﬁgurable patterns of behaviour bound by rules and customs that characterize organization’s on-going activity [11]. In other words, they represent the level of organizational maturity at the given point in time, and in order for the organization to move to high level of maturity, they have to question the existing level. However, questioning the status-quo of existing level is depending upon the responsiveness of the organization, which it attains through a process of learning ([32], [33]).

This form of isomorphic mechanism is different from existing known institutional pressures. For example, coercion is a force exerted on an organization by external entities upon which it is dependent such as suppliers, customers and regulatory agencies. However, conforming to the pressure exerted by external entities does not guarantee whether the organization will be able to reap the same advantages from the use of technology as that of the coercing entities. The behaviour of technology differs from organization to organization, because the use of technology follows a cause and effect relationship between the technology, organizational infrastructure, and humans. Therefore, if organization is responses to technical, organizational, and environmental changes, the chance of successfully aligning technology with the organizational capabilities and information requirements is possible. Organizational responsiveness contributes to normative mechanism because when an organization learns, it unlearns existing norms and shapes new norms and routines. Organizational learning capabilities are embedded in the organizations’ values and structures. For example, when a technology is introduced to an organization, they are certain norms and objectives associated with the intended use of technology. This norms and interpretations becomes routinized within the organizational environment and gives rise to taken for grantedness of use of technology, until the existing interpretation and meaning of technology is questioned due to the changes in organizational information requirements. This questioning of the interpretation of technology is directly dependent upon the internal forces through which the organization reflects on its behaviour and modifies it in light of past experiences and by developing new knowledge from the analysis of existing knowledge ([30], [32]). This mechanism complements mimetic forces because organizational learning leads to creating a learning organization, whereby uncertainties about various aspects of organizational life are reduced. In other words, the main reason for which organizations seek to be responsive is that they do not just want to imitate; rather they want to create and environment which provide them with an opportunity to learn from other entities and mature accordingly [23].

V. RESEARCH METHODOLOGY

This research follows a qualitative interpretive approach with an interpretive case study method. Interpretive research does not predefine dependant and independent variables but focuses on the complexity of human sense making as the situation emerges. This research is governed by the eight step framework proposed by reference [10]. These steps include getting started, selecting cases, crafting instruments and protocols, entering the field, analysing data, shaping hypotheses, enfolding literature, and reaching closure. This paper demonstrates the results of the within case analysis of two Australian organization who have adopted ERP. The with in case analysis is central to the generation of insight because it helps researchers to cope early in the analysis process with the enormous volume of data. The overall idea of this analysis is to become intimately familiar with each case as a stand-alone entity. This process allows the unique patterns of each case to emerge before investigators push to generalize patterns across cases [10].

In order to comply with the conditions sets by ethics committee of the university, case participants of this study cannot be identified by their real names. Therefore, the case participating organizations will be referred to as communication organization and electricity utility.

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organization. This is a research in progress, and the data is to be collected through on-site interviews of eight to ten participants in each site. These participants include enterprise architect, solution architect, business development manager, IT manager, business analyst, project manager, portfolio manager, and etc. that are engaging in various stages of ERP assimilation. In addition, secondary sources of data would include surveys, review of ERP implementation documentation, and observation of execution of workflow and day to day routine usage of ERP system. Through this triangulation of data sources, the collected data will be analyzed using data analysis software, i.e., NVivo. This software is useful in organizing data according to different themes emerging from the data collected, which allows testing theories or in directing the study to generate new theories. The following sections describe how organizational responsiveness pressure plays role in two large Australian organizations that are implementing ERP systems in their organizations.

VI. THE CASE OF ELECTRICITY UTILITY ORGANIZATION

Since 1990s, the context of this organization has changed from being a small service business to a large sized organization that enjoys a dominant position in electricity retail industry. The organization’s technological infrastructure has matured along the continuum of several standalone disparate legacy systems to integrated solutions. At present, its technological infrastructure is customer facing solutions, including a SAP R/3 ERP system and Oracle financials application that handle its critical back and front end processes. Since early 2000s the organization has made significant moves towards renewing its infrastructure. Initially, the organization moved financial, asset management and related backend modules from legacy system to Oracle solution. Later the organization integrated its billing system, customer relationship management and some important front-end processes within the SAP systems. These two technologies along with some retained critical legacy systems have been integrated to enable critical business application infrastructure.

The external environment of this organization is subject to frequent changes; therefore, it needs a solution that is capable of addressing the changed market demands. For example, as a part of government regulations, the power companies should develop the capability to provide customers with smart meters, so they can monitor their energy use. This requires real time integration of usage data with billing data. As mentioned above the organization has integrated its billing system with SAP. Therefore, the organization is able to provide customers with this information and in doing so respond to the changes imposed on the organization by external forces. As another example, the number and type of customers of this organization has been increasing steadily. Range of customers includes house-hold consumers to industrial customers. Therefore, responsiveness is the key competency that the organization is striving for. With an integrated ERP system and other core technology, the organization is able to manipulate information according to their needs. However, responsiveness is not just being able to process information; it requires a certain level of maturity of organizational processes, systems, as well as the organizational planning and management. This is where the organization has left a void in the process of technology institutionalisation. The organization has outsourced some aspects of ERP to a cloud provider. It acknowledges that once an organization outsources some aspects of a technology, it does not grow or attain maturity in that area. In other words, the organization is happy to stick to the level of maturity of their processes and technology capability. However, the impact of technology is quite profound and cannot be contained within particular processes or areas of the business.

A technology or an aspect of technology has a direct relationship with the context of the organization where each matures in keeping with the other. Assuming that a certain capability is not required by the organization may be cost effective in the short term, but in the long term is rendering a whole area of the entire organizational ‘system’ to not to grow in keeping with the rest of the organization. This results in lack of alignment between technology and organizational evolution, which contributes to lack of routinization. At the same time, the organization ‘takes it for granted’ that the outsourced capability is not critical for the organization, and hence information life cycle management and analysis relating to the outsourced aspects of technology are not institutionalised. When this organization first went through the process of ERP implementation, they had significant difficulties in implementing and adapting to ERP usage. Even though the organization went through an extensive process of pre-implementation technology assessment, yet it was difficult to craft the change management program that would see smooth implementation of ERP. Nevertheless, during this process the organization developed significant learning and knowledge sharing capabilities. This process acquainted the organization to the various aspects of technology use, which matured from viewing ERP as a standalone ‘although integrated system’ to a purposeful system, whose character changes with the organizational interpretation of its aims and objectives. There appears a significant disconnect between the process of organizational learning related to ERP implementation, adoption and routinization and strategic assimilation of ERP that necessary answers questions such as ‘where this organization is going’, ‘how it appears among its competitors’, and ‘how it appeals to its customers’.

VII. THE CASE OF COMMUNICATION ORGANIZATION

This organization is one of the leading organizations operating in a highly competitive telecommunications industry in Australia. Being a telecommunications business,
this organization is technology intensive and utilizes a variety of different technologies. In terms of business operations, this technology utilizes a number of legacy systems to automate backend and frontend processes. However, the journey of technical maturity in this organization has been a gradual one. This organization had attained significant maturity in the use of information technologies, as it has been using a mainframe system as the core technology platform. In 1990s, it started a program to move from mainframe systems to SAP ERP system in order to consolidate on to a major platform. This organization implemented SAP R/2 on their main frame systems, and subsequently when they changed to mini-computers, they implemented client/ server R/3 solution. Up till now, they have fully implemented financials, materials, and purchasing modules within the ERP system.

This organization had monopoly in Australia before 1990s and it was insulated from any kind of competition. However, with deregulation, new industry players entered into the market, which force the organization to be responsive to the external as well as internal environment. This organization believes that if it becomes internally efficient, it will be easy to address the external pressure. As a result they have gone through the process of redesigning business enabling IT infrastructure, with renewed added emphases on changing business requirements, business strategies, and goals. Internally, since there was no competition before 1990s, the organizational systems were not focused on the external environment; rather they were designed to maintain the status quo internally so as to induce internal stability within the organization. As a result, process were well defined, job descriptions were well defined and the organization was working like a well-oiled machine were each entity knew what it was supposed to do. Nevertheless, moving from mainframe systems to mini/ microcomputer environment was a sea change. Since the organization operated in the stable environment, its employees were not accustomed with change and its managers were not trained for change management. As a result, when the first ERP release went live in this company, the organization and its members were inexperienced and uncertain about the result of ERP adoption decision and were sceptic about its tangible and intangible benefits. However, through later releases of ERP and upgrading of its modules, employees have more rational idea about their capabilities and how the ERP system would affect their job description, function and entire organization. In this instance, the organization becomes a good exponent of the fact that if the organization learns from its past experiences, the probability of successful adoption, adaptation and assimilation of ERP system is increased. Being a formal government organization, the culture of the organization is heavily regimented. Due to this, the organization is good at taking direction, aligning itself with its industrial peers, and pursuing best practises. In doing so, although the employees of the organization seldom take outside the box and have a cynical view of technological innovations, yet they can be trained and made to operate technology in a particular way.

At the same time, a strong characteristic of this organization’s culture is knowledge sharing, which helps organizational actors to share their ideas with others. In doing so, when people share their experiences with technologies like ERP, it not only helps fellow employees in understanding more about the technology, but also shapes and evolves the use of technology in the organization.

VIII. DISCUSSION AND CONCLUSION

ERP assimilation is a nonlinear cyclic process of evolution within organizations. This process stipulates introduction of ERP system in the organization, use of ERP and sees it become dominant in the organizational life, and its institutionalisation within the organization. Once the organization is making optimal advantage of ERP, its use will be legitimized by the organizational stakeholders to contribute to the value of the organization. This legitimacy to provide value in day to day operations results in institutionalisation of the ERP system. The effect of institutional environment on technology implementation have been overlooked in the contemporary IS literature. Nevertheless, information system researchers tended to limit their attention to the effects of the institutional environment (i.e., coercive, normative and mimetic pressure) on structural conformity and isomorphism. Therefore, they fail to study the role of other institutional contexts which affect technology implementation and institutionalisation in organizations such as organizational context and its responsiveness capabilities. This paper, however, aims to fill this gap by introducing a new form of isomorphism, i.e., organizational responsiveness pressure. This mechanism helps organizations to understand how and why they exhibit similarity and variation in the use of organizational forms and managerial practices. This understanding is critical for tracing the relationship between organizations and the logic that constitutes their institutional context.

Organizational responsiveness helps business organizations to respond to external as well as internal changes. Organizations, thus, aim to develop internal capabilities, so as to use the same to address external challenges and to look similar to other evolving institutions. Organizational learning is at the core of responsiveness which refers to the ability of an organization to learn from past experiences and grow accordingly. Organizational learning considers organizations to be cognitive entities, capable of reflecting and modifying their own behaviour. A learning organization builds upon the lessons learned from past experience and creates new knowledge that equips the organization to respond to internal as well as external challenges. Organizations, therefore, are more inclined to implement information technologies, which support learning process and build knowledge around them; and enabling technologies that help capture, transfer and manage tacit as well as explicit knowledge.
Methodologically, this research follows the eight step process of building theory from case study research suggested by Eisenhardt [10]. This paper demonstrates the results of the within case analysis of two organizations in Australia who have adopted ERP. It aims to elaborate how organizational responsiveness mechanism influences institutionalisation of ERP system. The major research limitation of this study is that it is still in progress; therefore, the results reported in this paper are emergent and not complete. Another limitation of this paper is that it is Australian specific; therefore, the generalizability of the results in other settings cannot be ascertained.

REFERENCES


