Understanding Organizational Level ERP Assimilation: 
A Multi-Case Study

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Abstract

Assimilation of ERP technology into organizational routine has received increased attention in the literature. The main objectives of this study are to examine the different levels of ERP assimilation in companies and to understand the primary drivers of organizational level ERP assimilation. Using a multi-case study method in this exploratory research, we conceptualize ERP assimilation at organizational level in a hierarchical model from supporting business process, to supporting operational decision marking, and to supporting business strategies. We then identify some primary drivers of organizational level ERP assimilation, including environment uncertainty, perceived usefulness, and internal managerial need. Finally, we identify some facilitating factors for organizational level ERP assimilation, including interaction with vendor, cautious implementation strategy, and strong IT champion. Theoretical contributions and managerial implications are discussed.

1. Introduction

ERP systems have become the most significant information technology for companies of all sizes across the world in today’s globalized digital economy. According to a recent report by the market research firm AMR, the world wide ERP market is expected to grow from $28.8 billion in 2006 to $47.7 billion in 2011, at the annual rate of 11%; for the Asia-Pacific region, the ERP revenue is expected to grow from $3 billion to $5.7 billion, at the rate of 13% annually during the same time period, and will become the third largest ERP market in the world after North America and Europe [14]. With price tags often ranging from $3 million to over $100 million per ERP implementation project [22], ERP systems have also become the most significant IT investment for most companies in their capital budgeting.

In the IS literature, the lifecycle of ERP systems is often described in terms of three phases—ERP adoption, ERP implementation, and ERP assimilation. The focus of ERP research so far, however, has been on the adoption and implementation processes and the critical success factors related to ERP implementation projects. Recently, some researchers have moved beyond the adoption and implementation phases and into the assimilation phase (e.g., [16, 26]). This is because the ultimate goal of using any technology or innovation is to create business value or enhance business performance. The potential business value of ERP systems cannot be fully realized until they are extensively assimilated in various business processes they are implemented in and supporting.

While there is a stream of literature on IT assimilation in general (e.g. [1, 7, 19]), the research on ERP assimilation in specific is scant [16]. In today’s highly competitive markets, assimilating IT applications, such as ERP, is critical to companies’ success [16, 26]. Although its importance is clear, only a few studies have been conducted focusing on uncovering the factors behind the assimilation of ERP systems within organizations.

The purpose of this study is two folds. First, we want to address the question what the different levels of assimilation of ERP in organizations are. And second, we want to find out what the primary drivers of organizational level ERP assimilation are. To accomplish these objectives, we employed an exploratory multi-case study in which we visited 5 companies and interviewed 31 individuals. The patterns that emerged from these interviews across companies suggest that there are different levels of organizational ERP assimilation, characterized by the level of involvement of ERP systems in organizational decision making. Also, we identified the primary drivers and the facilitating factors that contributed to the organizational differences in the hope to provide prescriptive insights for managing ERP assimilation in organizations. In the remainder of the paper, we review
the literature background of this research and present
the research methodology and main findings.

2. Literature review

2.1. Definition of ERP assimilation

The studies on ERP assimilation stem from the
literature on technology assimilation in general. Purvis
[19] defined assimilation as “the extent to which the
use of technology diffuses across the organizational
projects or work processes and becomes routinized in
the activities of those projects and processes.” This
definition is often used in subsequent assimilation
studies (e.g., [16, 26]). On the other hand, Gallivan [11]
defined assimilation in terms of breadth and depth of
use. Breadth reflects how broadly the technology is
used in the organization, for example the number of
users and percentage of business processes that are
using the technology. Depth reflects how extensively
the technology is used by the users and in the business
processes. Bajwa [2] argued that assimilation has two
dimensions: acquisition and utilization. Acquisition (or
availability) is defined as the proportion of
organizational end users for whom an IT is available or
accessible; while utilization is defined as the extent to
which an IT is used. Similarly, the ERP assimilation
measure used in Liang [16] has three indicators that
cover the breadth and depth of ERP usage in an
organization.

One of the most recent concepts was proposed in
Hardgrave [12], which offered another view of IT
innovation assimilation. It presented a hierarchy of
assimilation model in term of depth in the context of
RFID technology. The hierarchy was grounded in
industry observations of the difficulty of early adopters
to fully realize the benefits of the RFID technology. At
the base level of the hierarchy is technology
deployment, followed by data understanding, and, at
the top of the hierarchy is business value creation.

Drawing on the extant literature, in this study we
define ERP assimilation at organizational level as “the
extent to which the ERP technology is used in
facilitating business processes and the degree it is
routinely used to support business operations.” In the
next sections, we use this basic definition to analyze
the levels of assimilation of ERP in various companies.

2.2. Studies on ERP assimilation

Although there have been a number of studies on
innovation and IT assimilation in general (e.g. [1, 7,
19]) during the last two decades, studies on ERP
assimilation appeared only in the past few years (e.g.
[16, 15, 26, 6]). Liang et al. [16] developed a research
model about assimilation of ERP by considering the
effect of institutional pressures and the mediating role
of top management team (TMT). Based on the
interviews conducted in three Canadian manufacturing
firms, Kouki et al. [15] tested the determinants of ERP
assimilation by using a case study methodology. Their
research framework includes organizational,
technological, and environmental factors. Their
findings showed that a number of factors were critical
for ERP assimilation, including smaller size of the
focal firm (fewer employees), IT skills and
competence, top management championship,
absorptive capacity, alignment with a firm’s business
strategy, managers and users feedback, and coercive
force from customers or government. In a longitudinal
study of ERP assimilation in Fortune 1000 companies,
Wang [26] found that in addition to institutional forces,
the external partners also exert significant influence on
the assimilation of ERP technology in the focal firm.
By analyzing survey data of over 1000 TMT members
from approximately 500 companies, Cereola [6] tested
a research model developed to study the impact of
assimilation of commercial open source enterprise
software (COSES) in small and medium sized
enterprises (SMEs). Specifically, the model explained
how top management team’s information technology
(IT) knowledge and experience impact both
assimilation and firm performance.

3. Research methodology

3.1. Multi-case study design

We adopted a case study approach because it is
considered most appropriate when “how” or “why”
questions are being asked about the focal phenomenon
or events over which the researchers has little or no
control[27]. As one of the most complex information
systems application ever developed for organizations,
ERP systems vary in terms of modules installed,
number of users, industries, vendors, and many other
characteristics. Thus it is also critical that a multi-case
design is adopted for this study. Our design called for
visiting companies that have successfully implemented
ERP systems with various sizes and in different
industries, representing a spectrum of ERP users both
in organizational and individual terms. In order for this
research to yield rich and reliable insight into the
complex issues of ERP assimilation, three levels of
individuals with diverse organizational roles and
background in each organization were selected for the
interviews, including members of top management
team, divisional or departmental level managers and ERP users.

In designing the interviewing questions, we were guided by the two research objectives and the theories related to innovation and technology assimilation described above, as well as the philosophy of cross validation, as strongly recommended in the case study literature [4, 10, 27]. Three sets of questions were developed targeting top management, middle level managers, and end users respectively. Each of the question sets consists of 16-19 open ended questions, ranging from managerial philosophies on the role of ERP in competitive strategies to how individuals use ERP for their daily work activities. Some questions were specifically designed for cross validation purposes.

Table 1. Profiles of interviewees

<table>
<thead>
<tr>
<th>Company</th>
<th>Number of interviewees</th>
<th>Descriptions of interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5</td>
<td>Top Managers: CEO, COO, CFO, COO</td>
</tr>
<tr>
<td>B</td>
<td>7</td>
<td>Top Managers: CEO, COO, CFO, COO</td>
</tr>
<tr>
<td>C</td>
<td>7</td>
<td>Top Managers: CEO, COO, CFO, COO</td>
</tr>
<tr>
<td>D</td>
<td>6</td>
<td>Top Managers: CEO, COO, CFO, COO</td>
</tr>
<tr>
<td>E</td>
<td>6</td>
<td>Top Managers: CEO, COO, CFO, COO</td>
</tr>
</tbody>
</table>

Table 2. Profiles of the case organizations

<table>
<thead>
<tr>
<th>Company</th>
<th>Location</th>
<th>Type</th>
<th>Industry</th>
<th>Annual revenue (million RMB)</th>
<th>Number of employees</th>
<th>Number of ERP users</th>
<th>ERP vendor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Shanghai</td>
<td>Joint venture</td>
<td>Plastic</td>
<td>200</td>
<td>2200</td>
<td>300</td>
<td>Developed in house</td>
</tr>
<tr>
<td>B</td>
<td>Shanghai</td>
<td>Joint venture</td>
<td>Gas equipment</td>
<td>300</td>
<td>280</td>
<td>188</td>
<td>External contractors</td>
</tr>
<tr>
<td>C</td>
<td>Shanghai</td>
<td>Private</td>
<td>Paint</td>
<td>150</td>
<td>160</td>
<td>20</td>
<td>UFIDA U8</td>
</tr>
<tr>
<td>D</td>
<td>Suzhou</td>
<td>Joint venture</td>
<td>Electronic</td>
<td>1200</td>
<td>3000</td>
<td>300-400</td>
<td>UFIDA U9</td>
</tr>
<tr>
<td>E</td>
<td>Hangzhou</td>
<td>Oversea Investment</td>
<td>Cosmetic</td>
<td>300</td>
<td>1300</td>
<td>50-60</td>
<td>UFIDA U8</td>
</tr>
</tbody>
</table>

3.2. Case companies and interviewees

The data collection process took about two weeks in March 2009 in several major China industrial cities. Three of the four authors participated in the interview process. The research team visited each site and spent from half-day to one day in each site. At each site, in addition to interviews, relevant documents including brochures and computer files were collected whenever they were deemed essential by the research team and made available to the research team upon request.

All interviews were recorded using digital recorders, with the explicit permission of the participants, and later transcribed into text using professional transcription service. Each interview started with the prepared open-ended questions which
were often followed up with questions that explored the ideas and thoughts as they emerged. A typical interview with one individual lasted about 30 - 60 minutes, with interviews with managers typically being longer than the ones with end-users. In a few occasions, the participating companies sent two or three end users together, so group interviews were conducted. In such occasion, the research team made sure that each interviewee had opportunities to express his or her viewers. In total, the research team visited 5 companies and interviewed 31 middle or top managers and ERP users from a variety of business departments and divisions, including IT, accounting, finance, operations, and procurement, and sales. For the purposes of confidentiality, the five case companies were referred to as A, B, C, D, and E in this paper. Table 1 shows the profiles of the interviewees, and Table 2 shows the profiles of the case companies.

4. Data analysis and case findings

4.1. A model of ERP assimilation at organizational level

![Figure 1. ERP assimilation model at the organizational level](image)

During the interviews and the post-hoc review of the transcripts, a clear pattern of ERP assimilation at organizational level emerged. In almost every company we visited, the level of ERP assimilation quite naturally fall into one of the three categories: supporting business process, supporting operational decision making, and supporting business strategy. Coincidently, these three categories of assimilation form a natural hierarchy of ERP assimilation. Intrigued by the ideas of Hardgrave et al. [12], we graphically represent the hierarchical model in Figure 1.

In this hierarchy, shallow assimilation reflects an organization in which the functionalities of the ERP system are utilized only in routine business operations; while deep assimilation reflects an organization which is using the functionalities of the ERP system extensively for its decision making and strategic advantages, resulting significant impacts on the overall performance of the organization.

The basic function of any ERP system is to support the effective and efficient execution of business processes in an organization. Naturally, the lowest level of ERP assimilation is about supporting business processes. At this level of assimilation, ERP is used for key business processes (finance, production, purchasing, inventory and sales) and, in some cases, for auxiliary business processes (HRM, CRM, BI, and OA). ERP applications are often used to generate reports for monitoring the health of the firms and analyze production data for improving efficiency. The impacts of ERP on organizational structure and performance are minimal.

The CIO of Company B indicated that ERP assimilation in her company was still at a supporting business process level: “Our ERP system has been used at a basic level. Although I know that ERP could provide some support for our decision making, we haven’t reached that level now. It can only support the operations at employee level, not the management level yet...... To our company, the main effect of ERP system is making our business processes more normative.” A similar situation was found in Company C, as described by the CFO: “I think the ERP system can’t directly support our business decision making. The role of ERP in our company is data management. It can help us to collect data...... However, the analytical functions of the ERP system haven’t been fully recognized yet. When we need some analytical reports, we export useful data from the ERP and analyze the data using EXCEL.”

However, this type of beliefs about the role of ERP in organization is not universal among all the companies we visited. In many companies, the successful use of ERP systems in supporting business processes only forms the baseline of ERP assimilation in organizations. At this level, the business value of the ERP system hasn’t yet to be fully realized. The next level is to analyze and utilize the data captured and reported by the ERP system to enable timely and informed decision making by managers at the operational level. At this level of assimilation, ERP is used to analyze production data to improve the effectiveness of business processes, market data to improve the effectiveness of marketing campaigns, and customer data to improve the effectiveness of customer service practices, etc.

The chairman of the board of Company D believed that his company was using the ERP system at the
level of supporting operational decision marking: “The ERP system can support the short to medium term production planning in my company now. But, there is still a distance to meet my objective. I hope the ERP system can support my low-cost and fast-reaction strategy in the future.” Similarly, the CEO of Company E used the following analogy when describing how ERP had been used in his company: “ERP assimilation in organizations may be categorized into five levels, including primary school level, middle school level, undergraduate level, master level, doctor level. I think my company is at the undergraduate level now.” Further discussion with this CEO led us to believe that his primary and middle school levels correspond to our business process support level definition and the undergraduate level matches well with our operational decision support level definition.

On the other hand, his idea about master and doctoral levels of ERP use points to what we believe to the highest level of ERP assimilation: the use of ERP for supporting business strategies or even creating new business strategies based on the capabilities of the ERP enabled business processes. At this level, organizations use ERP systems to gain competitive advantage in the market, such as long-term strategic planning based on business intelligence (BI), strategic alliances with partners based on integration of inventory and production modules, and implementing low-cost or differentiation strategy based on the analysis of production and market data. Organizations that operate at this level will most likely see greater return on their IT investment and better shareholder value in the marketplace.

The COO of Company A described how his company had been using the ERP technology at the supporting business strategy level: “ERP doesn’t only support our business processes but also yearly production planning. Furthermore, from the strategic perspective, it can support my company choosing the customers. By analyzing the sales order data in our ERP system, we can rank our customers according to the sales volume...... Also, we can analyze sales data following different terms, such as location and time. This can provide strong support to our production planning.”

Although only one of the five companies we interviewed had clearly reached the strategic level, and a couple may stay at the business process level for foreseeable future, some of the companies at the middle level were making progress moving up to the assimilation hierarchy. Managers in those companies, especially executive level managers, seemed to share the vision that eventually ERP systems would be playing more strategic roles, while admitting that they were not there yet.

4.2. Primary drivers for organizational level ERP assimilation

Our data so far have substantiated the conceptual model of organizational level ERP assimilation as shown in Figure 1. This leads to some interesting and important questions: how did an organization end up at a certain level? And what led the organizations to move up in the hierarchy? A further analysis of the interview transcripts showed that there were a number of primary drivers for an organization to move up the assimilation hierarchy. These drivers included environment uncertainty, perceived usefulness, and internal managerial need. Moreover, we found that some key factors identified in prior literature were insignificant in the context of our case companies, including government and business partners. We now provide a detailed account of these drives and factors for organizational level ERP assimilation based on our interviews.

4.2.1. Environment uncertainty. External business environment affects an organization’s internal decisions and behaviors in general and organizational innovation especially [8]. Environmental uncertainty is defined as “the difficulty of making accurate predictions about the future” [5] (p. 201). According to Iyer et al. [13], demand unpredictability and process turbulence are the two components of environmental uncertainty. Demand unpredictability refers to “the uncertainty and inability to accurately predict sales and market trends”, while the process turbulence is defined as “the rate, unpredictability, and volatility of change in production and logistics processes in a firm’s industry” [13] (p. 649).

During our interviews, it was clear to us that environment uncertainty was an important driver for organizational ERP assimilation. When environment uncertainty is high (e.g. volatility in demand), companies seems to need ERP system more to support faster and more accurate decision making. For example, the CEO of Company B stated: “The variety of customers is an initial driver for our ERP assimilation effort. At the earlier time, our customers were simple so that our products and market demands were also simple. We didn’t need to make our systems too complex. However, along with the number of customers increasing, the demands of our customers became diverse. At that time, more conflicts emerged. For example, if you satisfied one customer demand for product and delivery, that may impact the schedule of the other customers [due to inefficient production and material planning].....How to analyze and forecast
4.2.2. Perceived usefulness. Perceived usefulness is an important component of the Technology Acceptance Model (TAM) [25]. According to Davis [9], perceived usefulness referred to “the degree to which a person believes that using a particular system would enhance his or her job performance” (p. 320). While this is an individual level concept, our interviews suggested that it could be extended to the organizational level as well. From the perspective of an organization, perceived usefulness can be defined as “the degree to which an organization (its managers by proxy) finds that using a particular system would enhance the organizational performance”. Perceived usefulness can be viewed as the positive feedback of the ERP system from the perspective of the whole organization during the post-implementation period.

Our evidence shows that organizational level perceived usefulness has a positive relationship with the level of assimilation of ERP systems. For example, when being asked how he turned the top level managers’ negative attitudes into positive attitudes towards the ERP system after the implementation phase, the CEO of Company A said: “It’s due to a key production project. That project was one of the biggest challenges our company had and must be solved immediately at that time. We were able to resolve the problem with the help of the ERP system……Before that, many top managers didn’t believe in ERP. I started to emphasize the importance of ERP technology one year before that time. But, nobody believed me. After that crisis, everyone saw the effect [of ERP] in the end.”

This example shows that the perceived usefulness of ERP system leads top managers to believe that ERP can help them manage their company by solving complex business challenges. As a result, the organizational level ERP assimilation deepened. The manager of the finance department of Company C expressed similar view: “At the beginning of ERP use in our department, some users preferred their original handwritten account book to the ERP system. They had more trust in their handwritten account book than in the ERP system…… Then we gradually realized the usefulness of the ERP system, for example, the decreased human labor, real-time data, and more convenient data sharing. It helped us use this experience to promote more ERP use in the entire finance area.”

4.2.3. Internal managerial need. After the initial phase of ERP implementation is completed, the essential tasks of business process integration are usually completed as well and the ERP system becomes part of the management routine. However, what seems to happen is that new managerial needs and challenges will emerge, and these needs and challenges will call for higher level ERP assimilation.

Our interviews suggest that the growing internal managerial need is an important driver for organizational level ERP assimilation. In this paper, internal managerial need is defined as the problems and challenges that managers need to address when internal and external business environment shift away from the original conditions over time.

This was illustrated by the CEO of Company A when he explained why they had to continually improve their ERP system: “We developed our ERP system totally according to our internal managerial needs. Although our ERP system is not complete and the user interface is not pretty, it’s really useful for us……Our most valuable experience is to develop the system out of the managerial needs. If you don’t pay attention to managerial needs, you won’t have a successful ERP system.” This is also evident in the following statements by the Vice President of Company E and he showed us an example explaining the important role of internal managerial needs for organizational level ERP assimilation: “During the process of our company’s development, new needs will be proposed. For example, we started to use some modules of ERP system in 1998. However, if we implemented all the modules of [UFIDA] U8 in 1998, we wouldn’t be able to assimilate all of them. The most recent one, MRP module, had been implemented in 2005 because at that time the pressure of material management was becoming greater. So we chose that time to implement the MRP module……I believe that managerial need is a more powerful driver.”

4.2.4. Government. Management literature has long suggested that governments play an important role in business and management. It is believed that
governments matters in so many different ways and that they affect our lives and the conduct of business and trade [21]. From the perspective of strategic imperatives for IS assimilation, government policies has been found to be an important factor specific to firms in developing nations [23]. Studies had argued that government policies were a key factor towards IT adoption (e.g. [24]). In two empirical studies on ERP assimilation, Liang et al. [16] and Wang [26] both considered rules and regulations of government as measurements of pressures from institutional environment.

However, our interview data seem to suggest that governments hardly had any influence on organizational level ERP assimilation. For example, when asked if local and central government agencies had provided any incentives in terms of finance and regulation to promote ERP assimilation in organizations, the CFO of Company C expressed this view during our interview: “According to my knowledge, there has been no this kind of support yet in Shanghai. This is my personal view. Even though the government promotes companies to use ERP, it’s not significant to companies. This is because government can’t understand the actual needs of companies.” The Vice President of Company E also confirmed that: “To our company, this influence is insignificant. That is because the government is only an external factor. There are many external factors. But these external factors can’t become main drivers.”

While we can’t dismiss the role of government in ERP assimilation based on the evidence from just a few companies, this result does cause us to pause and rethink. We can no longer claim the role of government in a blanket statement. More studies are needed to understand the circumstances under which government agencies may or may not have significant impact on organizations in terms of technology assimilation in general and ERP in specific.

4.3.1. Interaction with vendor. In Wang [26]’s longitudinal study of ERP assimilation, it was found that in addition to institutional forces, the external partners also exert significant influence on the assimilation of ERP technology in the focal firm. The author employed resource dependence theory (RDT) to explain pressures from a focal firm’s exchange partners. Although Wang [26] reported that all three parameters related to the exchange partners (investors, suppliers, customers) were significant in general, our case evidence suggests that business partners’ influence on organizational level ERP assimilation is limited at best.

When being asked whether their business partners influenced their ERP assimilation, a user from the IT department of Company B said: “We just share some experiences about usage of ERP system [with our partners]. For example, when one of our suppliers wanted to implement PDM module, they learnt some experiences from us since we implemented earlier than them…… [Our business partners] can’t influence our business processes [in ERP system].” The CFO of Company C also confirmed that: “All of our business partners, including multi-national corporations and small companies, don’t have much influence on our ERP system.” The manager of finance department from Company D expressed this view about the influence on ERP from business partners during our interview: “When we didn’t have our ERP system, we found that, from the financial perspective, our suppliers’ financial data were very detailed. For example, we could check the invoice number in their system. We admired their ERP system a lot.” These statements seem to suggest that business partners could influence the initial adoption of ERP systems, and more in line with the mimetic pressure of the institutional theory [16]. However, it is clear to us that there is not enough evidence that suggests business partners affecting ERP assimilation after the initial adoption and implementation phases. This is again another area of future research interest.

4.3. Facilitating factors to organizational level assimilation

In additional to the primary drivers, we also found some other important factors in organizational level ERP assimilation. We submit that these factors enable, but not directly lead to, higher level organizational ERP assimilation. To differentiate them with the primary drivers, we call them “facilitating factors.” The facilitating factors may influence the direction and extent of processes that are already happening in the organization, but not to cause the processes to happen. Next, based on our interview data, we provide a detailed account of these facilitating factors for organizational level ERP assimilation, including interaction with vendors, cautious implementation strategies and strong IT champion support.

4.2.5. Business partner. In Wang [26]’s longitudinal study of ERP assimilation, it was found that in addition to institutional forces, the external partners also exert significant influence on the assimilation of ERP technology in the focal firm. The author employed resource dependence theory (RDT) to explain pressures from a focal firm’s exchange partners. Although Wang [26] reported that all three parameters related to the exchange partners (investors, suppliers, customers) were significant in general, our case evidence suggests that business partners’ influence on organizational level ERP assimilation is limited at best.

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4.3.1. Interaction with vendor. Interaction with ERP vendors is seldom mentioned in the extant literature. Kouki et al. [15] noted that a good relationship with ERP vendor is not a requirement for assimilating ERP systems. However, after analyzing the interview data, we found that, to some companies, interaction with ERP vendor played an important role in their post-implementation assimilation. Such interactions could lead to a strong relation between the client and the vendor. With this interaction, the client can get more
technical help from the vendor, while the vendor can benefit from the experience of the client for improving their own ERP product. It is truly a win-win process.

This situation was illustrated in Company D. This company chose to implement a new and still evolving ERP product from a national ERP vendor. The chairman of the board of the company explained: “We don’t like UFIDA U8, but we believe that UFIDA is a good company. We want to implement their new ERP product, UFIDA U9. However, at that time, U9 hasn’t been completed yet. Actually, we provided UFIDA a chance to do experiment with us. I believed that UFIDA would do their best to support my company since if U9 is not used successfully in our company, U9 will not be a successful product in the marketplace. Eventually, we became the first user of UFIDA U9.”

This phenomenon has been observed in other companies as well. The Vice President of Company E confirmed: “We have a good partner relationship with UFIDA. Some of their top managers are my friends…... We gave some advice on the improvement of UFIDA U8. And UFIDA would choose some of the most common demands from customers to include into their next ERP product release. During this process, our relationship gets closer and closer…… I go to UFIDA to talk to their product managers and top managers more than 10 times in one year.”

4.3.2. Cautious implementation strategy. ERP implementation strategy referred to the range and type of module selection and decisions concerning the strategy for integrating ERP with legacy systems [18]. Some companies choose a module-by-module strategy to implement ERP systems due to its modular nature, while others choose a full functionality implementation strategy in the hope to solve most of the problems once for all. In our interviews, we found that most of the companies seemed to be more risk averse and chose a module-by-module implementation strategy, which also led to lower pressures for the whole organization to assimilate the ERP modules implemented a few at a time.

It seems to us that a cautious implementation strategy has facilitated organizational level ERP assimilation in a positive way. This was illustrated in Company C as described by the manager of finance department: “Why the ERP system in my company is being continually used? In my opinion, one important reason is that we didn’t do it all at once. In fact, we took a long time…… Some companies I used to work for had encountered major problem in their ERP systems. One of them failed in ERP implementation. Why did that happen? They implemented all of the modules. Nobody knew either what they should do or how to integrate these modules together.” The Vice President of Company E also supported this view when being asked to give some advice to the companies that want to use ERP in the future: “Some companies had problems when using ERP systems, but they can’t solve them. Sometimes they don’t have a strong team to solve these problems. Or they don’t know IT at all, but they want to become IT professionals immediately. All of these lead to failures……. I believe that companies should have an IT strategy. You must go step by step. You should develop your ERP according to the different situations you are in. I still don’t have BI module in my ERP now. Why? We don’t need it, and I think the functions of BI module are not practical for us now.”

4.3.3. Strong IT champion. In the literature on the success of information technology (IT), it is suggested that an important antecedent to a successful implementation of information system is a “technology champion” for the new system (e.g. [20]). Information technology champions refer to the managers who “actively and vigorously promote their personal vision for using information technology, pushing the project over or around approval and implementation hurdles” [3] (p. 355). Although the need for a champion in the IS implementation is well documented, literature on the role of the champion in the post-implementation period is scant.

The role of the technology champion in ERP assimilation is clearly noted in our case companies. There is at least one IT champion in all of the case companies. Interviewees at top manager level confirmed the importance of IT champions. The CEO of Company A expressed this view: “The key person about ERP implementation is the CIO in companies. This person is difficult to find and his/her job is very difficult to do. People don’t know operations can’t become CIO. CIO shouldn’t only know IT…… In fact, the term “CIO” is wrong. If CIO and COO are separate, how can a good ERP system be developed? So, ideally, CIO and COO should be the same person.”

The case of the CIO of Company B illustrates the significance of continuity of IT champion. When the IT champion moved to another position, the ERP assimilation partly stopped. The CIO of Company B said: “If a company wants to succeed in using ERP system, there must be a special person to push the project forwards. Our implementation of knowledge management module stayed at the condition in 2007. [That’s because] I moved on to be in charge of sales in the northern territory in July 2007. So a lot of functions were not implemented. We were all using the functions that had been already completed [in 2007].”
5. Discussion

5.1. Theoretical implications

Our study contributes to the theories of technology assimilation in at least two ways. First, we proposed a hierarchical model for conceptualizing ERP assimilation at the organizational level that encompasses both quantity and quality dimensions at organizational level. This model can be viewed as an important foundation for designing comprehensive measurements for organizational level ERP assimilation. Furthermore, this organizational level model has its root in the literature on technology assimilation [1, 7, 16].

Second, we identified three primary drivers and a number of facilitating factors for organizational level ERP assimilation and called into question some of the previously held beliefs such as the roles of government, business partners in the technology assimilation stage. While we cannot assert our findings based on just a few cases, these findings call for further investigation in the future. Nevertheless, these findings, along with the conceptual model of organizational level ERP assimilation, lay the foundation for the development of more sophisticated theoretical models of ERP assimilation in organizations that can be empirically validated.

5.2. Managerial implications

From the managerial perspective, our findings offer some prescriptive guidance to management practices for the post-implementation period in the ERP life-cycle. First, we suggest that recognizing various customers’ demands and managerial needs can be an important approach for top managers to promote organizational ERP assimilation at a higher level. ERP assimilation should be a continuous process since firms’ competitive environment and internal managerial challenges will become more and more complex. Second, choosing an appropriate ERP implementation strategy is critical for the success of implementation as well as the subsequent assimilation. Considering the fact that most managers are risk averse, module-by-module strategy seems to be a better choice than the full-scale implementation strategy for most companies. In the module-by-module ERP implementation process, managers and employees will have enough time to witness the effect of the ERP system and develop positive perceptions of the usefulness of the ERP system. The success of some modules will lead to the demand for other modules, which eventually results in a full-scale implementation and higher level of assimilation. Third, we find that it is critical for a company to have at least one person who has intimate knowledge of both business and IT to become an IT champion in the company who will continue to lead the effort from implementation to the post-implementation assimilation. IT champions should come from the top management rank as well since they must have enough power and influence in decision making and resource allocations. Moreover, it seems to be very helpful for the IT champion to have a strong long term strategic relationship with the company’s ERP vendor(s).

6. Conclusion

The research on ERP assimilation in specific and technology assimilation in general is still evolving. Studies on technology and ERP assimilation are critical due to the significant benefits that may be derived only after the organization uses the technology effectively in all of their business operational and decision making processes [1, 16]. Using a multi-case study research design, we conducted interviews with top managers, middle level managers, and ERP users at five Chinese companies about the nature and the drivers of organizational level ERP assimilation. Drawing on the extant literature and our interviews with organizations that have implemented various types of ERP systems, we conceptualized the ERP assimilation at an organizational level and developed a hierarchical model. This model focuses on both the depth and the breadth of ERP assimilation in organizations. An organization could use this model to evaluate where they stand on both the depth and breadth dimensions of ERP assimilation and determine what they could do in order to move upward in the hierarchy and hopefully derive more benefits from their ERP systems. Furthermore, we identified three primary drivers of organizational level ERP assimilation, including environment uncertainty, perceived usefulness and internal managerial need. We also found that two widely reported drivers for organizational level ERP assimilation, government and business partners, aren’t as significant as suggested in prior studies. Last but not least, we found some important facilitating factors for organizational level ERP assimilation, including interaction with vendors, cautious implementation strategy, and strong IT champion.

Like in most case studies, our findings need to be considered in the light of certain limitations. First, this multi-case study is in a single country setting with its unique social, cultural, and economic characteristics. Thus, it necessitates caution when extending the findings to other countries. Second, the generalization
of the findings may be limited by the relatively small number of firms and industries covered in this study. Nevertheless, we believe this study has laid a solid foundation for developing more sophisticated and comprehensive models of ERP and technology assimilation in organizations by proposing the assimilation conceptual model and identifying the drivers and facilitating factors for organizational ERP assimilation. In addition, we also identified a number of possibilities for future research, such as the roles of government and business partners in ERP and technology assimilation.

7. References


