# Organizational Culture, Supply Chain Management Practices and Organization's Decision upon ERP Systems

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# ORGANIZATIONAL CULTURE, SUPPLY CHAIN MANAGEMENT PRACTICES AND ORGANIZATION'S DECISION UPON ERP SYSTEMS

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## Abstract

In recent years, more and more Chinese organizations have tried to adopt enterprise resources planning (ERP) systems to improve their supply chain management (SCM) practices and efficiencies and subsequently to increase their competeness in the marketplace. However, compared with their Western counterparts, the failure rate of ERP implementation for the Chinese organizations is much higher. Many of them find it very difficult to select an ERP system that fits their management practices. We believe that cultural differences could be the important reason contributing to the phenomenon that existing Western-based ERP systems cannot be directly adopted in Chinese companies. In this study, we propose a theoretical model that stipulates how organizational culture affects ERP decisions through influencing supply chain management practices. The object of this study is not only to provide insights for Western ERP vendors to modify/localize their existing systems to better fit local Chinese practices; but also to provide guidance for Chinese companies to select ERP systems or to develop their own systems. Empirical data will be collected to validate the proposed model. In order to develop measurement constructs for the survey instrument, company visits and interviews are conducted. In this paper, we shall reveal the initial findings from the interviews and discuss the steps forward.

## 1. Introduction

Enterprise Resource Planning (ERP) systems can help to facilitate enterprise-wide integration of information by linking suppliers, distributors and the customers together without geographical limitations (Akkermans et al., 2003). They may count as 'the most important development in the corporate use of information technology in the 1990s' (Davenport, 1998). Therefore, ERP system has become a "must have" system for many firms to improve competitiveness in the past few years [Sheu et al., 2004]. The cross-functional/cross-organizational integration allows companies to improve productivity and customer service while lowering costs and inventories.

In recent years, we have witnessed a dramatic increase in ERP adoption and diffusion in China [Huo, 2002]. Some companies (mainly large corporations) selected Western-based ERP systems like Oracle and SAP, some companies chose local Chinese ERP systems like Kingdee and UFIDA, others decided to develop their own ERP systems. Whatever systems that they have chosen, Chinese companies encountered many unexpected problems and even failures when implementing ERP in their organizations as ERP systems are extremely complex and difficult to implement [Xue et al., 2005]. Compared to their Western counterparts, the success rate of ERP system implementation of those Chinese companies is very poor. It was estimated that the ERP success rate in China is approximately 10% [Zhang et al., 2003]. ERP system has not achieved its objectives and even turn into a nightmare for many firms [Davenport, 1998]. Many Chinese companies have found it is quite difficult to find an ERP system that is very fit for their daily operations and management. Also, most companies did not recognize the difficulties until they are deeply involved into the implementation.

Moreover, if we take a look at the Chinese ERP market, one can find that this market has grown with an annual rate of 25% from 2002 to 2005 [Xue et al., 2005]. Western ERP vendors such as SAP and Oracle rush into the Chinese ERP market and make great efforts to catch a piece of this ERP pie. But it's really not easy for these Western ERP vendors to tame the Chinese ERP market. As reported by CCID Consulting (2002), only about 18.5 percent of the ERP market share was held by SAP and Oracle, who are the main Western ERP vendors in China. Western giants have not demonstrated their dominance in China ERP market the same way as they do in their Western world [Xue et al., 2005]. In addition, they meet many difficulties in localizing their software systems to facilitate the Chinese management practices. On the other hand, many local ERP vendors, who are supposedly more familiar with Chinese management practices, still find it difficult to implement their ERP systems for Chinese companies.

Therefore, in this study, we aim at helping these Chinese companies find ERP systems which fit their practices, as well as helping ERP vendors to localize or develop systems that culturally fit for the Chinese organizations.

## 2. Theoretical Foundations

We begin our discussion with the definition of culture. It is a big challenge for researchers who conduct

studies involving culture to arrive an understanding on what culture is, given so many definitions, conceptualizations, and dimensions used to describe this concept (Leidner and Kayworth, 2006). Hofstede (1980) defined culture as "A collective programming of the mind which distinguishes one group from another". He suggests culture be manifested by different levels of depth: symbols, rituals, heroes and values, among which values are the core of culture.

Among so many conceptualizations of national culture, Hofstede's (1980) work is one of the most popular. Based on his survey conducted in more than 50 countries, Hofstede identified four dimensions (power distance; individualism/collectivism; uncertainty avoidance and masculinity/femininity) to measure national culture; these dimensions became the basis of his characterizations of culture for each country (Hofstede, 1980). Later on, Hofstede and Bond (1988) conducted 'Chinese Values Survey (CVS)' and introduced the fifth dimension named 'Confucian Dynamism' or 'Long/Short Term Orientation'. There are also some other cultural instruments. For example, Hall (1976, 1990) proposed polychronism versus monochronism and context as dimensions to measure national culture. Trompenaars (1996) also proposed six dimensions to describe national culture; these dimensions include universalism/particularism, affective/neutral relationships, specificity/diffuseness, achievement/ascription, long term/short term orientation and internal /external control.

Besides national culture (cross-cultural) studies, there is another stream of cultural studies called organizational culture study, which is largely separated from cross-cultural study. At the organizational level, there are also many conceptualizations of organizational culture. Here we take the approach to divide the instruments into types and dimensions of organizational culture. For the organizational culture type instrument, the Competing Values Models (CVM) developed by Quinn and Rohebaugh (1983) is the most popular, the model measures organizational culture as four types: Hierarchy, Clan, Adhocracy and Market, which are the results of two pairs of competing values: internal versus external, flexible versus control; Cooke & Lafferty (1986) developed 12-dimensional instrument named organizational culture inventory (OCI) to measure organizational culture, these dimensions measure the behavioral norms as organizational culture; Hofstede (1990) proposed a six-dimension cultural framework (process-oriented/result-oriented, job-oriented/employee-oriented, professional/parochial, open/closed system, tight/loose control, pragmatic/normative) to distinguish different organizations, these six dimensions are used to measure the practices perspective of organizational culture.

Although many criticisms for Hofstede's cultural instrument exist, this study is going to use it as

it is well known for its relevancy, rigorous and relative accuracy (Ross, 1999; Sondergaard, 1993). On the other hand, we are not going to directly use the scores of Hofstede, we will measure organizational culture by using those dimensions in his instrument, which avoid most of the weaknesses of Hofstede. Hofstede's work has a great impact on both academics and practitioners, his dimensional model has been widely used in various business areas like information systems, operations management practices, human resources management, conflict management, total quality management etc.

In information systems field, there are many studies relating culture (both national and organizational culture) with various IS/IT behaviors such as information system development, IS/IT adoption and usage, IS/IT management, IS/IT outcomes, these studies find that culture has a significant effect on certain IT behaviors (Leidner and Kayworth, 2006).

At national culture level studies in IS field, many researchers used Hofstede's cultural scores to examine how culture affects various IT behaviors. For example, Garfield and Waston (1998) used case study to examine the role of national culture (described by uncertainty avoidance and power distance) in the development national information infrastructure, they found that countries will follow similar development models based on their similar cultural values. For the IT adoption studies, Hasan and Ditsa (1999) used interpretive field study to examine how national culture (in terms of uncertainty avoidance) affects technology transfer success. They found that IT is less readily adopted in risk-averse cultures as technology is perceived as inherently risky. Also, Srite (2000), Png et al. (2001) also reported their findings on examining how national culture affects IT adoption. Quaddus and Tung (2002) used Hofstede's cultural indices of the four dimensions and found that masculinity and collectivism lead to different uses of group decision support system (GDSS).

At organizational level, researchers examined how different organizational culture (in terms of cultural types or cultural dimensions) affects IT behaviors. Hoffman and Klepper (2000) studied how three types of organizational culture (networked, communal, fragmented, mercenary) link with success with new technology assimilation and found mercenary culture more be supportive of new technology assimilation. Ruppel and Harrington (2001) used competing values framework to represent organizational culture and found that developmental culture can facilitate intranet implementation. Kanungo, Sadavarti, and Srinivas (2001) used three types of organizational culture (innovative, bureaucratic, and supportive) proposed by Wallach (1983) to examine organizational culture's impact on IT strategy, they found that innovative type cultures are found to be most closely associated with firms having a delineable

IT strategy.

These IT-culture studies (Leidner and Kayworth, 2006) conclude that culture (organizational or national) plays a common role in determining patterns of IT behaviors (including IT development, adoption, use, and outcomes, management and strategy). However, the levels (national and orgaizational) of analyses are separated, which could be a new research opportunities for this study. In addition, there is a lack of measuring certain cultural dimension and examining its impact on certain IT behavior, in this study we try to fill in this gap.

We also found many studies relating cultural values to management practices (Newman & Nollen, 1996; Aycan et al., 1999). In operations management area, scholars attribute culture as an important factor to affect practices and subsequently affect company's performance. For example, Some scholars examined the relationships between culture, quality management practices and performance (Prajogo & McDermott, 2005; Naor et al., 2008). These studies proved that culture has a direct impact on management practices in general.

However, all of these studies emphasize the impacts of culture on management practices and IT behaviors respectively. We believe the existence of the relationships among culture, IT behaviors and management practices. In this study, we are not going to examine all IT behaviors, we focus on the decisions an organization makes upon ERP systems, and these include the willingness to use ERP system and the choices of using certain type of ERP system. We are not going to examine management practices in general; we focus on SCM practices, as ERP is closely related to SCM. Technologically, ERP is said to be the backbone of SCM, the integration of ERP and SCM is a natural and necessary process in strategic and managerial consideration, the most important trend for ERP vendors today is the integration with SCM (Tarn et al., 2002). Therefore, we suggest that SCM practices can directly affect an organization's ERP decisions.

In addition, we also believe that different companies adopt different SCM practices under different levels of supply and demand uncertainties they face, that is, they have different supply chain strategies (SCS) and subsequently practice differently in supply chain management (Mason-Jones *et al*, 2000; Christopher & Towill, 2002; Lee, 2002).

## 3. Research Model and Hypotheses

Based on the discussion above, we suggest that cultural differences could be the important reasons contributing to the phenomenon that existing Western-based ERP systems cannot be directly adopted in Chinese companies. For most management theories (i.e. ERP, SCM etc.) developed in the Western hemisphere, they are often assumed to be universally applicable (Zhao, et al., 2006), but this supposition is based on the premise that organizational culture and practices are strong enough to overwhelm the effects of national culture (Hofstede, 1993). However, there is a lot of evidence that national culture is stronger than organizational culture and its effect is quire robust (Zhao et al., 2006). Western-based theory or tools might not be appropriate in Chinese context (Leung et al., 2005). Thus, considering that most management initiatives are designed and developed by Western professionals and the structures and processes embedded in these initiatives reflect Western cultures, which make it harder to achieve success in different cultural contexts like China.

To settle the problems regarding of ERP systems, we put forward with the following conceptual model, which represents the relationships among culture, management practices and IT behaviors.
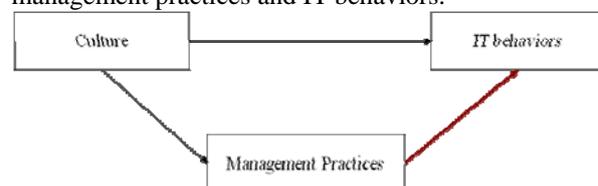


**Figure 1: the basic conceptual model**

In this study, we hope to find out the cultural factors that affect SCM practices and subsequently affect an organization's ERP decisions. In addition, we want to examine the role of supply chain strategies in SCM and ERP decisions. Therefore, we put forward with the following hypotheses.

*Hypothesis 1: organizational culture has a significant effect on an organization's decision upon ERP systems;*
*Hypothesis 2: organizational culture has a significant effect on an organization's supply chain management practices;*
*Hypothesis 3: an organization's supply chain strategy has a significant effect on an organization's supply chain management practices;*
*Hypothesis 4: an organization's supply chain management practices have a role as a mediator between organizational culture and an organization's decision upon ERP systems;*
*Hypothesis 5: an organization's supply chain management practices play a role as a mediator between an organization's supply chain strategy and an organization's decision upon ERP systems;*

## 4. Research Methodology

To prove the existence of the relationships among organizational culture, SCM practices and ERP decisions proposed above, we adopt an empirical method and develop a structuralized questionnaire to collect data to examine the research model and hypotheses. The whole study includes three stages:

In the first stage, we conduct a comprehensive literature review and factory visits, interviews with managers (mainly CIOs, production managers). The subjects of these field studies are those manufacturing

companies running in China, we define an ERP user company as one that has installed at least the basic modules of an ERP system. Based on the findings of the literature and field studies, we develop and fine tune a questionnaire for data collection.

In the second stage, we will conduct data collection in the industries. We choose two different industries to facilitate the future comparison of this study. This will include several comparisons: within industry comparison and between industries comparison. We also compare according to different ownerships of the companies investigated.

In the last stage, we will analyze the data and explain the findings, after which some suggestions upon ERP systems and SCM practices for ERP vendors as well as organizations that are going to adopt ERP systems will be put forward.

## 5. Findings, Discussion and Further Plans

To help us to validate the conceptual model and develop an instrument to prove the theory we propose, we conducted some field studies in some Chinese firms. We chose three companies which are quite different in terms of ownerships to conduct our site visits: a local Chinese state-own enterprise (SOE) (namely S company), a local Chinese private company (namely P Company) and a Hong Kong private company running in China (namely F Company).

Before we went to visit these companies, we used email and telephone to contact the person who is in charge. We used a draft questionnaire which is an open-ended based as a guideline to interview the managers of the companies. The questionnaire covers the constructs defined in the research model above. We asked them the facts they choose ERP systems and their usage of ERP systems, we also asked them their SCM practices in terms of supplier relationships, customer relationships, lean production, information sharing etc. the tables in appendix show the details of the findings we summarized from the site visits and the responses from the questionnaire.

From the findings in factory visits and interviews, we basically see the existence of the relationships among culture, SCM practices and ERP decisions. What is more important is to empirically prove existence of these relationships. Therefore, we have developed a questionnaire including organizational culture, SCM practices, ERP decisions and supply/demand uncertainties.

As the theory we put forward with in the beginning, cultural differences could be the important reasons contributing to the phenomenon that existing Western-based ERP systems cannot be directly adopted in Chinese companies. We add efficiency-oriented vs. flexibility-oriented as a dimension of SCM practices, of which we think could be a dimension to differentiate Chinese local companies and the Western companies. We also add

*Guanxi* (interconnections and relationships) as a dimension of organizational culture, of which we think is an important dimension of Chinese culture. In the next stage, we will fine tune the questionnaire through discussion, field study and pilot test. Especially, we want to find out those cultural dimensions to differentiate Chinese and Western culture. After this, we will conduct our data collection in China and hope to prove the theory we put forward.

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## Appendices: the findings from Interviews
### Table 1: ERP decisions and usage of the three companies

|  | S Company | P Company | F Company |
|---|---|---|---|
| | ERP Decisions and Usage | | |
| *ERP system used in the organization* | UFIDA U8 ERP (embedded with UFIDA finance) | Self-developing ERP + Kingdee finance software | Microsoft Axapta +   Kingdee finance software |
| *Modules used in the ERP system* | Inventory management Human resource management (HRM) Finance management | Production management Purchase management Order management Customer service | Production planning, inventory/warehouse management, logistics management, order and sales management, purchase management, HRM |

| | Sales management Purchase management | management Inventory management HRM | |
|---|---|---|---|
| *Main purpose of using ERP* | finance management and inventory management | Production planning, material management and inventory control | Production management |
| *Main benefits of using ERP system* | N/A | Shorter order cycle time, Improve perfect order fulfillment rate | Lower inventory level |

**Table 2: SCM Practices of the three companies**

| | S Company | P Company | F Company |
|---|---|---|---|
| | SCM Practices | | |
| *Strategic Supplier relationships* | Very stable in supply | The company is weak in bargaining with suppliers, supply uncertainty becomes a problem for the company | A few suppliers become strategic suppliers and they affect the company's product development |
| *Customer relationship* | The demand from customers are stably forecasted | Many communications with customers including before and after sales; | Few feedback and communication with customers, but the company also builds up long term relationships with customer; stable customer groups have been built up. |
| *Information sharing* | N/A | Less information shared with suppliers but more with customers | More information shared with suppliers but less with customers |
| *Internal lean production* | N/A | The company completely practices pull-production, ERP system is used to facilitate the design and planning for each kitchen to reduce error and waste. | the company keeps compressing cycle time and reducing waste in production; they try their best to reduce inventory level and practice pull-production |

**Table 3: Supply and demand uncertainties of the three companies**

| | S Company | P Company | F Company |
|---|---|---|---|
| | Uncertainties in supply and demand | | |
| *Supply Uncertainty* | Low | High | Medium |
| *Demand Uncertainty* | Low | High | Low |

**Table 4: Organizational culture in the three companies**

| | S Company | P Company | F Company |
|---|---|---|---|
| | Cultural dimensions | | |
| *Power distance* | High, The ranking and status in the company is clear, the organizational structure is like a pyramid. | Low, good relationships have been built up between common staffs and the bosses, employees participate in important decision making | Low, employee participate in daily management issues of the company, organizational structure is relatively flat |
| *Uncertainty avoidance* | High, as the foods are closely related to human health and life, risk should be avoided | Low, the company makes many efforts to import new techniques and theories. | High, as the company produces dangerous chemicals, trial and errors are made very carefully |
| *Collectivism vs. individualism* | Collectivism, this company is a traditional SOE in China | Collectivism, employees like to work as a team and work for the good of the company | Collectivism, employees regards them as part of the company and like to work as a team |
| *Open system vs. close system* | Medium | Open system, new employees are easy to fit in the company; | Open system |
| *Pragmatic vs. normative* | Normative, the clients are mainly from their chain stores | Highly pragmatic, the company tries the best to get customers, and to satisfy customers | Pragmatic, the company tries their best to satisfy the customers |