The Misalignment between Packaged Enterprise Systems and Chinese Context: A Context Study of Packaged ES Adoption in China

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THE MISALIGNMENT BETWEEN PACKAGED ENTERPRISE SYSTEMS AND CHINESE CONTEXT: A CONTEXT STUDY OF PACKAGED ES ADOPTION IN CHINA

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Abstract

This conceptual paper reviews a large number of literatures in terms of packaged enterprise system adoption and implementation in China. Three types of misalignments between packaged ES and Chinese context are identified, including (1) package-context misalignment in terms of software application, (2) package-context misalignment in terms of organizational management model, and (3) package-context misalignment in terms of organizational IT maturity. Based on (Soh and Sia 2004)’s ERP package-organization misalignment source framework, the researcher identified two group of contextual variables which direct or indirect results in these misalignments in Chinese context: (1) institutionally imposed contextual variables and (2) voluntarily acquired contextual variables. Based on these findings, the conceptual paper argues that, for the discussion of dealing with the package-context misalignment in Chinese business context, it is necessary to consider the context source which causes the misalignment, and then appropriate strategy can be confidently chosen to tackle with system misfit problem.

Keywords: Packaged enterprise systems, China, package-context misalignments
1 INTRODUCTION

In the latest decade, China has witnessed a dramatic increase in packaged enterprise systems (ES) adoption and diffusion, on the premise that ES will drive strategically important organizational change to Chinese organizations. However, despite the promises and continued popularity of ES, the success rate of ES project in China is appropriately 10% (Xue et al. 2005), which is much lower than the figure released by western counterparts. Recently, a number of studies argued that the system-context misalignment is one of the critical management issues hampering the ERP implementation success and future efficient assimilation (Hong and Kim 2002; Soh et al. 2000; Soh and Sia 2004). Soh et al. (2000) further observed that the ‘misfit’ or misalignment phenomenon could be worse in Asian business context, because the underlying structure of most ERP systems influenced by the US and European business processes which in many cases are substantially different from those prevalent in business in Asia. This paper attempts to investigate the current state of packaged ES in China market and the contextual factors influencing the package ES adoption and assimilation. Having reviewed and scrutinized a large number of research papers and assays, published in top outlets in areas of Chinese IS implementation and management, this paper addresses a variety of misalignments issues between ES package system and Chinese context as well as identifies a list of contextual variables resulting in these misalignments from the technology-organizational-environment perspectives (Soh and Sia 2004; Tornatzky and Fleischer 1990).

2 THE ANALYSIS FRAMEWORK

Technology innovation theorists proposed a technology-organizational-environment perspective, by which they argued that three element of a firm’s context, consisting of organizational context, technological context, and environmental context, will influence the process of technological innovations adoptions and implementation (Tornatzky and Fleischer 1990). Organizational context posits to a rich source of structures and process that constraining or facilitate adoption of innovation; technological context describe both the internal and external technologies relevant to the firm; and environmental context is the arena in which a firm conducts its business (Tornatzky and Fleischer 1990).

Specific to the issue of package-organization misalignments, Soh and Sia (2004) argued that contextual differences between the package and implementing organization are important source contribute to the misalignments. In Soh and Sia (2004)’s framework, context source is operationalized into two types of contextual variables influencing the match between package ES innovation and organizations: (1) context source comes from external authoritative pressures which imposed on organizations (Scott 1988). The institutional pressures are exerted by ‘the coercive authority of nation states’ (DiMaggio and Powell 1983), through laws, regulations (Soh and Sia 2004), and the requisite structures (such as national culture) that organizations inherit, comply and remained in their structure. (2) Context source can be chosen by individual organizations based on their own interest and conditions. An economic entity are always able to find a variety strategic to ‘negotiate, persuade, and debate’ (Orlikowski 2000) with the institutional environment. That is, organizations are likely to have more leeway in choosing an appropriate structure based on their own interests and conditions, in other words, organizations can adopt structures voluntarily to find a niche and gain a unique competitiveness. Both types of contextual variables jointly work to shape current organizational structure of the implementation company, then subsequently causing the mismatch between package software and implementing organizations.

This extended institutional perspective is very useful to interpret the misalignments identified between packaged ES and Chinese organizations. Based on Soh and Sia (2004)’s framework and technology-organization-environment framework (Tornatzky and Fleischer 1990), a framework of packaged-context misalignment framework is developed and depicted in Figure 1. In the left hand, two types of contextual variables influencing the package-organization misalignments in China were identified. One is institutionally imposed contextual variable, including national economic environment,
government policy/regulation/legal requirements, national culture and language, and enterprise ownership. The second type of contextual variables is voluntarily acquired by originations, including organizational structure, organizational-specific technique experience and technical sophistication. As described in figure 1, these two types of contextual variables result in a variety of misalignments between ERP package and Chinese organizations, including (1) misfits in terms of software application design, (2) a discrepancy between Chinese conventional management model and the management model embedded in packaged ES, and (3) a gap in terms of technical sophistication of Chinese organizations and the technical complexity of packaged ES. Each of these contextual variables and package-context misalignments in Chinese context is discussed in following sections.

3 PACKAGE-CONTEXT MISALIGNMENT IN CHINESE CONTEXT

3.1 Package-context misalignment in terms of software application design

The ES package provides a generic solutions with purported ‘best business practice’ that dictates how a company structure its organizations, production and management(Sathish and Pan 2007). ‘The best practice’ reflects an idea of ‘technical fix (Swan et al. 1999)’ that vendors keen to adopt. The technique suppliers perceive the technical artefacts as a fix physical entity which parameters has been defined, codified and packaged—the design of such technology could (or maybe) relatively independent of the context where they are used (Swan et al. 1999). Following this ‘technical fix’ idea, ERP packages prescribe clients with a procedural vision and means for segmenting, organizing and carrying out work in contemporary enterprise settings(Kallinikos 2004a). In an ERP package, these procedural and segmented works are then codified as data, process, and transactions within and across functions of an organization. Therefore, in a traditional software application perspective, we can examine the misalignments in the technical level. Three categories of misfits are identified from the previous studies, including data, process, system output/interface.

Data misfits arise from incompatibility between organizational requirements and ERP package in terms of data format and relationships among entities as represented in the underlying data model (Soh et al. 2000). For example, the ERP package must equipped to handle double–byte characters, since written Chinese is not alphabet-based(Trombly 2006). There are also cases that Chinese names or terms go beyond the defined number of characters in data field in ERP system (Soh et al. 2000).

Process or functional misfits arise from incompatibilities between organizational requirements and ERP packages in terms of the processing procedures required (Soh et al. 2000). This type of misfits are also entitled as ‘feature-function fit’(Goodhue and Thompson 1995; Sathish and Pan 2007), mainly pertaining to the extent to which the internal organizational functionality can be supported by external package features. When a large number of user’s requirements are missing from the system, a low alignment between system features and organizational functions exists.

Last but not the least, output/interface misfit arise from incompatibilities between organizational requirement and the ERP package between presentation formant, information content and user interface design(Hong and Kim 2002; Soh et al. 2000). This type of misfit is a crucial one in Chinese company. Take financial module as an example, China implements a very different accounting and taxation system compared to West. In this case, the misfit of financial report content and format cause great difficulties in implementing international ERP package(Brown and He 2007), and a number of
Chinese companies prefer to choose local systems which are compatible to national financial system (Ge and Voss 2009; Trombly 2006; Xue et al. 2005).

3.2 Package-context misalignments in terms of embedded management model

Yusuf et al. (2006) ascribed the poor fit between ERP and the Chinese company to a fundamental incompatibility between the prescribed ERP business model and traditional Chinese management systems. In China, the traditional business and production system is conducted in a unique way, where decisions heavily rely on manager’s experience and intuition (Martinsons and Westwood 1997); management information is communicated through hard copies of reports; manufacturing is based on traditional planning system (Wang et al. 2005); and production plans is revised much more frequent (Brown and He 2007) than western counterparts. It is also noticed that Chinese managers and ES users have different perceptions on information sharing, strategic decision making, task standardization and empowerment; however, those issues are emphasized by ERP package or believed to be the primary benefits delivered by ERP. All these issues present a gulf between ERP embedded practice and Chinese organizations.

Information transparency: Chinese prefer to transfer knowledge through interpersonal contract rather than through formal and written means. This informal communication manner defies the information codification and openness prescribed by information systems (Lu and Heng 2008). Meanwhile, in Chinese context, the meaning of a message always depends on its context and its content, therefore, data and information will lose much of their meanings if they are encoded in a simplified form and deprived from the context (Martinsons and Hempel 1998; Martinsons and Westwood 1997). Besides, the released information is selective and incomplete. It is always encouraged to release information that promotes conformity and suppresses the information that undermines stability(Xue et al. 2005). Information control is also related to organizational power in Chinese hierarchy management structure (Davison 2002; Lu and Heng 2008; Martinsons and Hempel 1998). Critical information is one of the predominant sources of power in China, which are kept as personal asset rather than an organizational resource(Martinsons and Westwood 1997). In this circumstance, ERP and ERP-enabled information sharing and openness conflict with Chinese fundamental value, and information transferring and release are rather different compare to West. Chinese management might feel uncomfortable with information disclosure.

Decision making: The decision making mode in Chinese business context is also misaligned with the way a packaged ES prescribe. ES facilitate better decision making by providing timely, accurate and reliable data(He 2004; Shang and Seddon 2002). The Chinese entrepreneurial model of strategy making that relies on personal knowledge and intuition rather than dry data, objective criteria and qualitative methods(Lu and Heng 2008). Meanwhile, the decisions making process only involves few peoples and take very short to make (Martinsons and Hempel 1998). It is also noticed that the decision making in Chinese organization are highly influenced by institutional dictation of the government authority.

Business process : Morton and Hu (2008) argued that, in the context of ERP adoption, organizations with a low level of business integration and a relatively non-standardized work process will encounter higher resistance from within, as the ERP pushes the organization to integrate functions and units and adopts the standardized business process embedded in the system. However, Chinese company are lack of formality in business process and planning (Martinsons and Hempel 1998), representing as informal information transferring, reliance on networking and relationship, and intuitive decision making as discussed above. ERP system, which emphasize planning, standardization and elaborate procedures(Kallinikos 2004b), therefore place an heavy burden of adaptation and reengineering on Chinese company where business process often vary markedly from West (Yeh et al. 2006).

ERP package also characterize as cross-functionalities, which enable unified vision of firms and force organizations move away from function-based system towards process-oriented integrated system(Al-Mashari 2003). Other scholars believed that ERP increase interdepartment coordination and promote the ‘interdependence’ across functionality units. This notion of task interdependence seems to align with Chinese value of harmony, however it is not simply the case. A number of scholars pointed out,
under the broad umbrella of collectivism, Chinese value an ‘individualistic collectivism’ (Lu and Heng 2008), where small group or family values and interests is emphasized and protected, rather than holistic society-oriented (Lu and Heng 2008; Marble and Lu 2007). Therefore, a coordinated behaviour across departments is not attained easily in Chinese organizations as assumed. When ERP impose such interdepartment coordination in the context and overriding vested interests within a group, resistance probably occurs in the company.

ERP package dictate standardizations by redefining responsibilities and clarifying job role in each step of the procedural chain in a corporation business process. Thus, employees need to acquire new knowledge and are further delegated reasonability to make decisions. It is not appropriate to assume that all people in different context are welcome to the empowerment (Yusuf et al. 2006). In Chinese context, where people get used to centralized administrative system, there is considerable reluctance to accept those empowerment initiative (Davison 2002). It is a normal phenomenon that many clerical staff at the bottom of the hierarchy feels much safer if they are told what to do and informed what is expected (Davison 2002).

**Attitude towards organizational change:** As so many misfit issues arise from the incompatibilities between ERP package and Chinese organizations, radical change towards management and business process are required accompanying the packaged ES adoption. Shue et al. (2004) suggested that, to take a full advantage of ERP software, business process reengineering (BPR) is a prerequisite. BPR is defined as ‘the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporize measures of performance, such as cost, quality, service and speed’ (Hammer and Champy 2001). The definition of BPR indicates that ERP enacts radical change that challenge existing organizational culture and conventions, and arguably undermine the current authority and power in the company. However, literature indicated that, when Chinese confronting radical change they are not expected and prepared, the resistance will be widely observed, such as in the scenario of ERP adoption. ‘People will then use relationship, power or other approach to stop the IS implementation’, as suggested by (Lu and Heng 2008). (Shanks et al. 2000) also commend that ‘change management in the Chinese context is not important. Change is accepted if it is demanded’. In a context where harmonious equilibrium is pursued, people are more favour of mild, stepwise and incremental change rather than a disruptive and rapid one.

### 3.3 The misfit from the perspective of IT maturity in Chinese context

A general rule observed is that, the more sophisticated the level of the software, the harder it will be to sell in China (Hayward and Wiggins 2006). This argument is echoed by a number of studies, which reported technique complexity, high price and massively IT human resource demanded as obstacles hampering Chinese organizations from adoption ERP system (Ping and Grimshaw 1992; Shue et al. 2004; Yusuf et al. 2006; Zhang et al. 2005). We argue that there is an implicit gap between packaged ES and Chinese context due to the technique complexity of such technology and the immaturity of Chinese organizations in terms of using technology.

Firstly, data accuracy is not a given in Chinese organizations whereas not a big issue in other context. Poor quality of legacy data, data format and data content inconsistency has been singled out as critical issue in Chinese ERP adoption (Brown and He 2007; Shanks et al. 2000). Secondly, Chinese organizations are often more dependent on external parties’ technical supports due to lack of internal qualified IT staff to deal with such sophisticated IT projects. (Zhang et al. 2005)suggested both the vendors support and consultant efforts are critical for Chinese ERP adopters. In spite of the IT professionals, there is a long run to establish a learning mechanic to educate competent end users, to encourage appropriate usage and to transfer the knowledge from proficient user to novice. In Chinese organizations where is lack of the necessary learning and changing environment, resistance to the ERP is implicit yet hard to defy (Zhang et al. 2008). End users keep telling the mismatch of user requirements and technical problems yet reluctant to deal with this problem with IT professionals (Avison and Malaurent 2007). The compliance made Chinese user nominally supported the project, but in fact they did not take the training and participant opportunity seriously (Zhang et al. 2008). This will eventually lead to data of poor quality, inappropriate system configuration, misalignment
between user requirement and software. All this accumulated passive attitude and overt or covert resistance will turn out to be a failure situation.

In a conclusion, ERP involve technology, people and functions. When we are talking about the sophisticate technology, we cannot afford to overlook the people who will work with the system. The end users of fix mind-sets and of poor quality, who are conservative to change and passive to learn, are one of the major obstacles to fully realizing the potential benefits of ERP.

4 THE SOURCE OF MISALIGNMENT

4.1 Institutionally imposed contextual variables

The figure 1 shows that, in the scenario of Chinese enterprise system misalignment, the most influenced institutionally contextual variables are related to economic environment, government policy, national cultures and enterprise ownership decided by politics.

**Economic environment:** China is still a developing economy which heavily relies on its abundant source of low-cost labour. Only a few organizations address the need to utilize advanced technology to gain new competitiveness as a substitution of reliance on low-cost labour and manufacturing low value-added products (Hayward and Wiggins 2006). The disadvantageous economic foundation naturally forms an enormous gap between current computing environment in Chinese enterprise and sophisticate ES package and solutions. Nevertheless, there are many Chinese firms stand on each development lifecycle and it is not rare case that a start-up business realizes tremendous expansion in only a few years. This rate of change and quick expansion means that ‘one-model-fit-all’ or ‘one stop shopping’ is not realistic for those Chinese businesses, hence a flexible system which is easily customized and take into account the dynamic business practice is required in those companies (Liang and Xue 2004).

**Political and regulatory factors:** Government policy and legal requirement are very crucial institutionally contextual variables in the context. In China, government regulation and dictation supersede organizational goals and also shape organizations’ economic activities (Zhang et al. 2008; Zhao and Grimshaw 1992). The tax policies, accounting regulations and importing/exporting process differs from that of Western countries. All this national regulatory norms and standards require the conformity of software products in terms of data format and output content and format. Chinese organizations will purchase ES which is compliant with this institutional variable; otherwise system customization is necessary.

**National culture and language:** Chinese culture is the most popular lens by which the IS misalignment issues are interpreted. Hofstede’s national culture model is the most frequent cited in explaining cultural influence in light of IS usage and implementation. Martinsons and Westwood (1997) and Martinsons and Hempel (1998) instantiated Hofstedes’s culture criteria within the context of Chinese IS management, which is instructive in discerning misalignment between packaged ERP and Chinese organizations. For instance, the long power distance together with individualism collectivist largely influence Chinese ES users’ attitude towards information transparency. Another example is the national culture of uncertainty tolerance is arguably related to the unstructured business process. The table 1, adapted from (Lu and Heng 2008), presents both Hofstede’s culture model and Martinsons et al. (1998) culture dimension.

<table>
<thead>
<tr>
<th>Hofstede Culture criteria</th>
<th>(Martinsons and Westwood 1997) culture dimensions</th>
<th>Attribute in Chinese context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masculinity/ Femininely</td>
<td>Relationship to the environment</td>
<td>Harmony maintenance</td>
</tr>
<tr>
<td>Individualism/ collectivism</td>
<td>Fundamental social units</td>
<td>Collective</td>
</tr>
<tr>
<td>Power distance</td>
<td>Management structure</td>
<td>Hierarchical</td>
</tr>
<tr>
<td>Uncertainty avoidance</td>
<td>Uncertainty tolerance</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Attitude to change</td>
<td>Conservative</td>
</tr>
</tbody>
</table>
Language is another crucial contextual variable largely related to the package-organization misalignment in Chinese context. Language difference leads to a misfit in term of data form in some ERP package (Shue et al. 2004). Language difference also result in communication barrier which is far more difficult to overcome (Avison and Malaulent 2007). In some multinational ERP project, some key Chinese employees who are not proficient with English felt that they has been left out and the communication with foreign ES expert are inefficient (Avison and Malaulent 2007). Moreover, the language issue will affect system manual documentation and training program (Shue et al. 2004), since it is not an effortless task to translate document and tailor training program for local needs.

**Enterprise ownership:** Enterprise ownership is probably one of the most unique China-specific variables influencing the package-organization alignment (Reimers 2003). China takes a somewhat special role as different ownership structures can be found side-by-side. This includes state-owned enterprises (SOE), foreign-invested enterprises, and privately held companies. A bulk of evidence shows that ERP implementing/usage results vary among firms with different ownership characteristics (Ge and Voss 2009; Ma and Loeh 2007; Martinsons 2004; Yusuf et al. 2006). Non-SOE tends to report more chance of success than SOE business. The arguably reason for this phenomenon is that the organizational structure of non-SOE are more compatible with the structure embedded in packaged ES compared to traditional SOE. As the ownership characteristic is imposed by political factors, such as economic system (e.g. socialism and capitalism), it logically categorized as institutionally contextual variable.

### 4.2 Voluntarily acquired contextual variables

According to Figure 1, the voluntarily acquired contextual variables include organization’s structure, organization-specific technique experience and technique resource. This category of contextual variables, in contrast to those external authoritative variables which require absolute conormities from organizations, allow the organizations to respond with a amount of flexibility and with accordance to their self interests. However, it is noted that this freedom is also under the broad umbrella of the externally institution environment.

**Organization structure:** Morton and Hu (2008) argued that the integration and standardization imposed by most ERP systems might not be suitable for all types of organizations. Thus, the ‘fit’ between the organizational structure of the adopting organization and the standardized business process designs embedded in the packaged ERP affects the likelihood of ERP success or failure. They afterwards argued that the Packaged ERP system will be more ‘fit’ to the organizations which is characterized as high formalization, high structural differentiation and a low decentralization\(^1\). This argument is applicable to Chinese adopters. Taking the SOE as an example, being the main part of economy and taking unique political and economic roles in Chinese society, SOEs gain a specific organizational structure, featuring low formalization, low decentralization and medium to low structural differentiation. SOE’s organizational structure is probably unfit to the structure of packaged ERP as previous study indicated (Morton and Hu 2008). In a contrast, non-SOE Chinese enterprise tends to have a larger amount of leeway to choose a more efficient business process and organizational structure to survive in a market-driven economy. Non-SOE is more compatible with structures embedded in packaged ERP (Martinsons 2004). The different organizational structures

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1 Morton and Hu (2008) defined (1) ‘formalization’ as ‘the standardization of work processes and documentation’, (2) ‘structural differentiation’ as ‘the differences in goal orientation and in the formality of the structure of the organizational units’, and (3) ‘decentralization’ as ‘the extent to which power over decision-making in the organization is organization is dispersed among its members’.
acquired by various types of companies can render scholar a lens to interpret the discrepancy between Chinese SOE and non-SOE in term of ERP success.

**Technology experience:** Most of Chinese company has no ‘historic path’ in term of using sophisticate enterprise purpose solutions (Ma and Loeh 2007). SOEs typically had a low pre-existing level of process automation, and exiting IT applications were restricted to financial accounting and very basic inventory control (Martinsons 2004). Taking a historical perspective, Chinese ERP type of solution was originated from stand-alone accounting software and gradually evolving into the ERP concept. This evolution course is largely pushed over by local vendors who strive for survival in the dynamic Chinese ES market, rather than stemmed naturally from the need of Chinese enterprise. Thus, the boom of Chinese ERP market is largely attributed to the technology suppliers’ effort on diffusing concept of ERP, and the discrepancy between the level of IT maturity in Chinese organizations and ERP technology complexity has been ignored intentionally.

5 DISCUSSIONS AND CONCLUSION

This conceptual paper reviews a large number of literatures in terms of packaged enterprise system adoption and implementation in China. Three types of misalignments between packaged ES and Chinese context were identified. Based on (Soh and Sia 2004)’s ERP package-organization misalignment source framework, the researcher then identified two group of contextual variables which direct or indirect results in these misalignments in Chinese context.

The research indicates that, for discussion regarding what options Chinese organizations and ES package developer can pursue in order to minimize the misalignment issues, is dependent on which type of contextual variables invokes the incident of misalignment. For example, if the misalignment is caused by institutional variables, such as government regulation or political issue, the package localization and customization probably is the only feasible solution. However, if the misalignment is caused by voluntarily variables, such as lack of technical experience and top management style, it then has leeway to negotiation for the organizational change or software customization.

The author finally concludes that introducing ERP system entails an opportunity which transforms the old-fashioned Chinese management model towards a scientific, standardized and integrated one. Because of the national culture and characteristic, the change might not be welcomed at the first place and a lot of painful resistance has taken place in many Chinese firms, but we argue that the reform of Chinese management is necessary and worthwhile, which is one of the significant and profound impacts received from enterprise systems.

References


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2 The full list of reference is available upon request. Due to the page limitation, only a few of key reference was included.