What's Wrong with ERP in China?

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Abstract. ERP was introduced to Chinese organizations for about 30 years. However, the successful ERP implementation rate are always kept low, sometime even lower than 10 %. By adopting Hofstede (2001) national culture dimensions, this study provides substantive explanations and conclusions about the effects of national culture dimensions on organizations' ERP implementation successful rate.

Keywords: ERP · China

1 Introduction

As a central efficient solution strategy, enterprise resource planning (ERP) becomes to a key management package in most of the organizations in the world since last two decades. Benefits from ERP systems are obvious. Through data standardization and process integration, ERP systems have the potential to facilitate communications and co-ordination, enable the centralization of administrative activities, reduce IS maintenance costs and increase the ability to deploy new IS functionality (Gattiker and Goodhue, 2000). When they are well implemented, ERP systems are able to bring operational, managerial, strategic, IT infrastructure and operational benefits to their customers (Shang and Seddon, 2000). ERP systems have spread rapidly among organizations all over the world.

After three decades, China grows up rapidly and has now become the second largest economy. During the development, China adopted tons of new technologies, advanced business and management theories and applications. ERP is one of the blooming market in China for the past twenty years. The evolution of ERP in China can be summarized into three stages:

1. 1988 to 1995: SAP is the first ERP vendor entered China in 1988. After that, more and more international ERP vendors, such as Oracle, PeopleSoft etc., followed in around early 1990s. This was the first time Chinese organizations first heard business process reengineering (BPR) and ERP. According to many reasons including several strong culture reasons, many Chinese organizations tried to implement ERP. Unfortunately, very few succeeded. At this stage, over 90 % of the ERP market were taken up by foreign ERP vendors (Zhang et al. 2002).
2. 1996 to 2002: Because of high failure rate of ERP from foreign vendors and high demand of ERP in the market, many of Chinese domestic vendors began to design

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and develop small scale of ERP packages. At this stage, domestic vendors took over the ERP market from the foreign giant vendors. Because of complicated and rapid changing accounting and financial policies in China, large foreign ERP vendors were hard to localize their packages in China. However, domestic ERP vendors, most of which were accounting software development vendors before, easily put a lot of unique Chinese characteristics in their agile ERP packages. Therefore, most of the Chinese organizations at this stage went to the domestic vendors for ERP solutions. Unfortunately, the failure rate of ERP implementations got even higher, over 90 % (Liu 2014).

3. 2003 to date: Some Chinese organizations realized issues from domestic vendors, such as unreliable system, non-integrated functions, fatal database systems, etc., then switched to foreign vendors. The rest of the organizations still relied on domestic vendors, mainly because of the cost. In this stage, according to IDC report (2015), there are too many software packages announced to have ERP functions in the Chinese market. However, most of them were not fully functioned ERP systems. Most of the current "ERP" packages are more close to a sub function in one of the ERP modules. Therefore, on one side, most of the Chinese organizations need ERP packages with Chinese characteristics; on the other hand, they are looking for inexpensive packages. For other organizations, they are willing to adopt ERP systems from giant foreign vendors. However, even large companies, like SAP, entered China almost thirty years, there are still not many skilled Chinese consultants available for their packages. In results, the reputation of the ERP systems from these ERP vendors in China are expensive and difficulty to implement. Some of the Chinese researcher even declared that the successful rate of ERP applications in China was close to zero (Liu 2014).

Comparing the ERP adoption and usage in China and western countries, we found an interesting issue that even for the same package of ERP, the results could be totally opposite. Xue et al. (2005) argue that cultural issues could make ERP adoptions and implementations much more difficult. Therefore, in the study, we focus on culture influence on ERP adoptions, especially what are the key factors of Chinese culture influencing the successful ERP adoption of Chinese organizations.

2 Literature Review

Today, a vast amount of the ERP studies focus on management perspectives of ERP on either implementations or post-implementations. However, cultural impact was not addressed in previous research studies as a determinant factor of successful ERP adoption. Only a few of studies concern the culture issues in ERP implementations. After study different dimensions of culture differences, Alhirz and Sajeev (2014) only find a significant influence between uncertainty avoidance and perceived user involvement and user resistance with ERP in a Saudi Arabia case study. By recognizing the cultural differences, a Thai corporation adopted "Cultural Intelligence" strategy in the ERP implementation to ensure the successful ERP implementation (Meissonier et al. 2014).

The culture differences between China and Western countries toward IT/IS implementations have been recognized by many researchers (Martinson and Revenaugh 1998; Martinson and Westwood 1997; Ping and Grimshaw 1992). Martinson and Revenaugh (1998) argue that fundamental values in Chinese culture does conflict with IT-enabled strategic change which generated from Western managerial culture on a "harmonious equilibrium with the system and the respect of hierarchical authority." Sheu et al. (2003) study on four US-Taiwanese manufacturing organizations and find five categories of culture related differences influencing successful ERP implementation: language, culture, politics, regulations and management style. Soh et al. (2000) identified three cultural issues including incompatibilities of data format between organizational requirements and the ERP systems, incompatibilities in processing procedures required, and incompatibilities in information reports and presentations of ERP.

After analyzing the failure cases of Chinese ERP implementations, Liu (2014) points out two cultural characteristics among Chinese organizations while facing to the ERP adoptions: over self-criticizing of management capability, which makes Chinese organizations believe that everything made-in-China cannot be compatible with foreign products, over estimation of the quality from Western countries, which causes Chinese organization being easily persuaded by foreign vendors. Davison (2002) summarizes the cultural differences on ERP implementations between North America and Hong Kong into three issues: different beliefs in providing access to information, misunderstanding/miscommunications due to complications of Chinese language, and significant difficult reengineering processes. Avison and Malaurent (2007), through a case study of failure ERP implementation in a Chinese branch of an international organization, find that four categories of issues: organizational, cultural, political and economic. Additionally, they argue that linguistic factors are crucial.

3 Theoretical Background

Hofstede (2001) introduced a five dimension classification of cultures based on a survey of employees in IBM subsidiaries located in fifty countries.

Power distance index (PDI) identifies how societies under different cultures regulate the behavior of their members. In large power distance countries, the less powerful members expect and accept the inequality of power distribution. Lower power members are required to be obedient and respectful to higher power members. For example, employees are rarely encouraged to challenge their superiors. In countries with lower distance power, children are allowed to contradict their parents or challenge their teachers. In ERP implementations, Chinese organizations always emphasize that ERP is a so called "Leader support project", which is similar to Top management support in Western culture. However, in most of the Chinese organizations, there is only one leader in the organization who is the King of the organization. If the ERP project gain the support from this leader, most likely all the resources will be lean to this implementation and the successful rate gets much higher for the project. Hence, we suggest the following hypothesis:

H1: The higher the country's PDI score, higher leadership support more likely will cause higher successful ERP implementation.

According to Hofstede (2001), uncertainty creates anxiety and people feel threatened by uncertain or unknown situations, for example, knowledge of a life after death. Uncertainty Avoidance Index (UAI) describes how people adapt or cope with these uncertain or unknown situations. In high UAI cultures, people tend to adopt technology, law, rules, and religion to decrease the ambiguity of situations by making events clearly interpretable and predictable. Organizations in high UAI cultures will not take unnecessary risks and only plan and complete those projects with enough value that they can explicitly approve in the market.

Since there are so many uncertainties in an ERP implementation, to avoid these uncertain issues, organizations in high UAI cultures are inclined to stay with trusted vendors and controllable scale of implementations. Hence, we suggest the following hypothesis:

H2: The higher the country's UAI score, the more likely companies in that country are will choose vendors with better reputation implementing with reliable ERP packages. Therefore, the successful rate of ERP implementation will be high.

Individualism and collectivism index (IDV) represents the relationship between the individual and collectivity or the group in a certain society. Individualism and collectivism impact the decision making of a person in the society. Individualism culture is more toward personal decision making with less influence from the surrounding collectivity or group.

For example, converting oneself from believing one religion to another is a highly individual activity in the countries with high individualism score while, in high collectivism countries, it is more reasonable that people tend to change their views together with their surrounding groups. In countries with low individualism culture, organizations are more likely to adopt the BPR and implementation suggestions from the vendors instead of having their unique methods. Hence, we suggest the following hypothesis:

H3: The higher the country's IDV score, the more likely companies in that country are to consider better BPR and implementation solutions, therefore, the implementations will gain the higher successful rate.

The fourth dimension in Hofstede's model is Masculinity (MAS) and Femininity. Basically, Hofstede (2001) argues that gender differences come from the natural differences between men and women. Culture could be more Masculinity or more Femininity according to how the societies define and follow norms in different ways. From his survey, Hofstede found two basic facts.

First, historically, masculine cultures tend to be more militaristic; second, masculine cultures tend to be more competitive while feminine cultures try more to encourage cooperation. Masculine cultures focus more on ambition, making quick decisions with less cooperation. Therefore, organizations with higher MAS scores tend to implement the ERP project alone without too much cooperation. Hence, we hypothesize the following:

H4: The higher the country's MAS score, the more likely companies in that country are to implement the ERP alone without too much involvement of consultants. Therefore, the successful rate of the implementation will decrease.

In his second edition of Culture's Consequences, Hofstede (2001) defines a new dimension of national cultures:

Long- Versus Short-Term Orientation. This Long-Term Orientation Index (LTO) score is based on a Chinese Value Survey (CVS) conducted in 1985 from students in 23 different countries. Cultures with high LTO scores tend to persist for a longer time with higher perseverance. The key words in LTO connotations summary are persistence, perseverance, personal adaptability to different circumstances, and believe of the happening of the most important events in life in future.

On the contrary, people in Low LTO cultures expect quick results, prefer personal steadiness and stability, and believe that the most important events in life occurred in past or occur in present instead of future.

Therefore, we expect that organizations in high LTO cultures are more likely to focus on future results with long strategy and operations planning, and more receptive to changes which may offer better results in the future, while as companies in low LTO cultures tend to emphasize short term benefits and are resistant to change. Obviously, ERP implementation will be a relatively long project, but the benefits will come eventually. Therefore, organizations in high LTO cultures will be patient to work on the project and expect the successful results.

H5: The higher the country's LTO score, the more likely companies in that country are getting higher successful rate for long term ERP implementation.

4 Data Collection and Analysis

A survey was sent to 127 organizations in three US cities (one large city, one mid-size city and one small town) and 432 SMEs in three Chinese cities with similar city size pattern. A total of 186 surveys were completed and 164 (71 from US and 93 from China) were used in the analysis. Table 1 shows the industry distribution of the companies.

Table 1. Industry distribution

Industry	Number	Percentage
Industrial Manufacturing	31	19 %
Public Sector	18	11 %
High Technology	49	30 %
Education	12	7 %
Healthcare	26	16 %
Utilities	7	4 %
Others	21	13 %

The items used in this survey were adapted from Hofstede's IBM and China survey questionnaires. The reliability of the items was evaluated using Cronbach's alpha [17].

The coefficient alphas for the PDI, UAI, IDV, MAS, and LTO were 0.82, 0.80, 0.79, 0.75, and 0.81, respectively. Pearson's correlation coefficients were also determined to assess the convergence validity. Since all the attribute coefficients were somewhere from high to moderate ranges, they were all retained for future analysis. Additionally, there were no concerns about multi-collinearity because none of the coefficients was extremely high.

The data were analyzed using multiple linear regression analysis. The purpose of a regression analysis is to relate a dependent variable to a set of independent variables. Regression analysis, therefore, was the most appropriate analytical technique in this study to determine the relationship between customer commitment and innovation characteristics, between customer attitude and innovation characteristics, and between customer commitment and customer attitude. Table 2 shows the hypothesis testing results along with the conclusions whether the hypothesis is supported by the statistical analysis at $\alpha < .05$.

Table 2. Summary of Regression Analysis Results

Hypothesis	Independent Variable	t-value	Significance	Support
H1	PDI	−4.987	<0.001	Yes
H2	UAI	−2.858	0.021	Yes
H3	IDV	4.066	<0.001	Yes
H4	MAS	2.413	0.028	Yes
H5	LTO	−1.055	0.302	No

5 Discussion and Conclusion

As demonstrated by the data analysis above, this empirical study supports hypothesis 1, 2, 3, and 4, while hypothesis 5 was not supported. Consequently, we can answer the research question in our study. First, national cultural variables, such as PDI, UAI, IDV, and MAS are related to successful ERP implementations; secondly, national culture should be added to the framework in ERP implementation studies.

The findings indicate that level of LTO is not related to successful ERP implementation. The possible reason to explain this result may be because the index was measured in 1985. With the remarkable and rapid economic growth, Chinese culture of LTO may change from the long term expectations to short term visions. Therefore, the results show an opposite direction e between the two countries.

Our study provides substantive conclusions about the effects of national culture dimensions on ERP implementations in organizations. We formulated a number of hypotheses regarding the influences of various national culture dimensions, such as PDI, UAI, DVI, MAS, and LTO. According to our data analysis, we found evidence to support most of our hypotheses. We can conclude that national culture does influence the successful rate of ERP implementations in organizations. Hofstede dimensions appeared to be a good theoretical background for ERP implementation study.

References

Alhirz, H., Sajeev, A.: Do cultural dimensions differentiate ERP acceptance? a study in the context of Saudi Arabia. Inf. Technol. People **28**(1), 163–194 (2014)

Gattiker, T., Goodhue, D.: Understanding the plant level costs and benefits of ERP: will the ugly duckling always turn into a swan. In: Proceedings of the 33rd Hawaii International Conference on System Science, Hawaii (2000)

IDC report. China Business Analytics Services 2015–2019 Forecast and Analysis (2015). http://www.idc.com/getdoc.jsp?containerId=CN25099. (Accessed on Jan. 2016)

Liu, Y.: Analysis of the dilemma between low successful rate and high demand of ERP. Productivity Res. **10**, 2013 (2014)

Martinsons, M., Revenaugh, D.: IT-enabled strategic change in the Chinese business culture. In: Proceedings of AMCIS, MD, USA (1998)

Martinsons, M., Westwood, R.: Management information systems in the Chinese business culture: an exploratory theory. Inf. Manage. **32**, 215–228 (1997)

Meissonier, R., Houze, E., Lapointe, L.: "Cultural Intelligence" during ERP implementation: insights from a Thai Corporation. Int. Bus. Res. **7**(12), 14–28 (2014)

Ping, Z., Grimshaw, D.: A comparative study of the application of IT in China and the West: culture and the stages of growth model. Int. J. Inf. Manage. **12**, 287–293 (1992)

Shang, S., Seddon, P.B.: . A comprehensive framework for classifying the benefits of ERP systems. In: Proceedings of the Americas Conference on Information Systems, Long Beach (2000)

Soh, C., Kien, S., Tay-Yap, J.: Cultural fits and misfits: is ERP a universal solution? Commun. ACM **43**(3), 47–51 (2000)

Xue, Y., Liang, H., Boulton, W., Snyder, C.: ERP implementation failures in China: case studies with implications for ERP vendors. Int. J. Prod. Econ. **97**, 279–295 (2005)

Zhang, L., Lee, M., Zhang, Z., Chan, J.: A framework of enterprise resource planning system implementation success in China. In: Proceedings of the Pacific Asia Conference on Information Systems, Tokyo (2002)