Western ERP Roll-out in China: Insights from Two Case Studies and Preliminary Guidelines

Paola Cocca[a], Filippo Marciano[b], Elena Stefana[c] and Maurizio Pedersoli
Department of Mechanical and Industrial Engineering, University of Brescia, Via Branze 38, Brescia, Italy

Keywords: Enterprise Resource Planning, Multisite ERP Implementation, China, Chinese Culture, Case Study, Roll-out, Western ERP.

Abstract: China is one of the countries with the highest failure rate of implementation of foreign – western - ERP systems. Western companies encounter difficulties in their roll-out projects in China mainly for cultural issues. Based on the insights from two case studies, this paper aims to provide a preliminary analysis of the main criticalities of western ERP roll-outs in China and suggest guidelines to increase their success rate.

1 INTRODUCTION

An Enterprise Resource Planning (ERP) system is defined as "a set of business applications or modules, which links various business units of an organisation such as financial, accounting, manufacturing and human resources, into a tightly integrated single system with a common platform for flow of information across the entire business" (Beheshti, 2006).

Although the first introduction of ERP systems dates back to the 1990s (Jacobs and Weston, 2007), the rate of success for this kind of projects remains relatively low (Panorama Consulting, 2015).

China is reported by the literature to be one of the countries where the failure rate of implementation of foreign - western - ERP systems is very high (Ge and Voss, 2009; Xue et al. 2005, Zhang et al. 2003; Zhang et al. 2005). Indeed, cultural differences play a relevant role during the implementation of the ERP system in those countries whose culture is radically different from the culture of the ERP vendor. Culture affects the communication, the organization structure, how the technology and the business are perceived, the legal requirement, and generates resistance to change in all users whenever the imposed ERP culture is different from theirs (Zhang et al., 2005).

Having become one of the greatest economy in the world, China and its market are of great interest for western enterprises, that often decide to establish there a subsidiary or to make a joint venture with a Chinese company. These enterprises adopt ERP systems of western vendors and thus may encounter difficulties in their roll-out projects in China. A roll-out is an expansion of the domain of the ERP from a company (or a group of companies) to a subsidiary that currently does not use an ERP or uses another system. It is basically an implementation of the ERP system that is running in the headquarters, in one or more of the subsidiaries. Managing a multisite ERP implementation project is particularly challenging when multiple locations with different managerial reporting lines, languages spoken, and national cultures are involved (Markus et al., 2000).

The topic of ERP roll-out of western companies in their Chinese subsidiaries is under-investigated in the literature. Only Avison and Malaurent (2007) describe the case of the roll-out of a French firm's ERP in its Chinese subsidiary, first analysing the main criticalities, and then, after a few years, assessing the post-implementation results (Malaurent and Avison, 2015).

A few papers dealing with ERP implementation in China are available in the literature, but they deal mainly with the implementation of a western ERP by independent Chinese companies, not foreign-owned

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[a] https://orcid.org/0000-0002-6351-6042

[b] https://orcid.org/0000-0003-3502-9092

[c] https://orcid.org/0000-0002-6679-0362

(Zhang et al., 2003; Zhu et al., 2010; Sun et al, 2015; Xue et al., 2005; Srivastava and Gips, 2009; Yan et al., 2019; Lai et al., 2016; Marble and Lu, 2007; Liang et al., 2004; Elmeziane and Elmeziane, 2012). In addition, Reimers (2003) and Zhang et al. (2005) present some cases of ERP implementation in Chinese foreign-owned companies, but they do not clarify if they were stand-alone ERP implementation or roll-outs.

Although the majority of issues and critical success factors identified for a western ERP stand-alone implementation in China might be valid also for an ERP roll-out, roll-outs present some peculiarities that should be taken into consideration. For example, due to the need to adapt local business processes to a global standard template, a multisite ERP implementation may not necessarily yield the same benefits across all the local subsidiaries (Carton and Adam, 2003). Furthermore, the degree of process standardisation imposed to the subsidiary impacts the degree to which the ERP system will change managerial autonomy, task coordination, and process integration in the subsidiaries: change in these factors usually provokes organizational conflict and adds a "political" element to ERP roll-outs (Markus et al., 2000).

Based on these gaps identified in the literature, the objective of this work is to analyse the main criticalities of western ERP roll-out in China and suggest guidelines with the aim of increasing the success rate of such projects.

The paper is organised as follows. In Section 2 an analysis of the background literature is performed to identify the cultural elements that could affect an ERP roll-out project, in particular focusing on Chinese culture. Section 3 describes the research methodology adopted. In Section 4, two cases studies of roll-out projects are presented and discussed. Finally, based on the main insights from the case studies some preliminary guidelines to increase the success rate of roll-out projects in China are provided.

2 BACKGROUND

2.1 Cultural Issues in ERP Roll-out Projects

The culture of an organization is defined as "a pattern of shared basic assumptions that a group learns as it solves its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think and feel in relation to those problems" (Schein, 2000).

Then national differences such as national culture, language, management style, politics, regulations and customs can affect the "way of doing business" (Hofstede, 1983; Simchi-Levi et al., 2000.), and thus, organisational culture (Carton and Adam, 2003).

Many authors assert that organizational culture plays an important role during multisite ERP systems roll-outs and there is a need to recognise the unique social context, especially when the ERP business model reflects western practices (Shah et al., 2011; Soh et al., 2000; Davenport, 1998; Umble et al., 2003; Wagner and Newell, 2004; Ward et al., 2005). Moreover, the failure to adapt ERP packages to fit the national culture could lead to project running over time and over budget (Krumbholz et al., 2001).

Culture has been identified as being one of the most important factors influencing the success of ERP systems (Chadhar and Rahmati 2004; Leidner and Kayworth 2006; Palomino Murcia and Whitley, 2007). Indeed, cultural preferences and practices may exacerbate problems since companies which implement ERP systems suffer a radical change in their organizational information systems (Davison 2002, Olson et al. 2005).

The following cultural factors that could affect ERP roll-out projects have been identified in the literature:
- Mismatch with local culture: ERP systems are packaged software; this means that they contain the vendor's culture, most of the time under the form of "best practice". The "best practices" embody the best applicable business processes, without taking into consideration local characteristics. This causes a "clash of culture" whenever the local practices developed by national requirements (for example law, taxation, ecc.) are different from "best practices" (Davenport, 1998; Davison, 2002; Zaglago et al., 2013).
- Management culture: if managers cannot see the strategic implication of ERP systems or cannot activate all the company to move in a certain direction, the company will be affected by it (Talet and Al-Wahaishi, 2011).
- Cultural change: the viewpoint of most enterprises is function-based, while ERP systems are process-based, therefore the introduction of an ERP could cause disruptive organisational changes, thus generating resistance inside the organisation (Hammer, 1990; Marnewick and Labuschagne, 2005).
- Information flow: if the culture of the subsidiary is highly hierarchical, it is possible that information is

not shared inside the company, thus the integration is deterred (Marnewick and Labuschagne, 2005).

- Communication culture: if management does not explain its action to employees, on the longer run, the workforce will not have the holistic view of the organisation and its goals (Talet and Al-Wahaishi, 2011). The lack of information exchange results in distorted use of the ERP systems, because they will be used to reinforce hierarchical control instead of cross functional integration (Rasmy et al., 2005).

- Language: different languages hinder the communication between the parties. The assumption that English can be used as the only language of communication is incorrect: it is possible that users may not be fluent in English. Whenever this happens it is necessary to deploy countermeasures. Possible problems that can rise from different language usage are: misinterpretation, inability to use the system, incorrect specifics, training failure (Avison and Malaurent, 2007; Malaurent and Avison, 2015).

2.2 Chinese Culture

One of the most business relevant characteristics of Chinese culture is the "*guanxi*". The core idea of "*guanxi*" involves "relationships between or among individuals creating obligations for the continued exchange of favours" (Dunfee and Warren, 2001; Zhang et al., 2009). Due to personal obligation with another person an individual might also pursue behaviours that are detrimental to his/her company. Nonetheless the Chinese people see the "*guanxi*" as a useful way of doing business because the bond between two individuals/enterprises gives benefits in the long run (Marble and Lu, 2007). For example: a supplier can always accept an emergency order if that customer gives priority to that supplier when making orders, even if it is not the best candidate. "*Guanxi*" can be seen as a double-edged sword, as it can allow profitable relationships for both of the actors/parties, but it can also hinder them whenever individuals sacrifice the best interest of the organisation to maintain their personal relationship.

Chinese business affairs are governed by personalism and high context communication resulting in heavy reliance on informal (oral) rather than formal (written) communication/interchange (Martinsons and Westwood, 1997). This is highly in contrast with the highly formalised, rule-based approach of western ERPs. As an example, many Manufacturing Resource Planning (MRP II) system implementations did not benefit the company because they were only used as inventory recording systems instead of being used as planning tools (Marble and Lu, 2007).

The Chinese are affectionate to their way of doing business and do not want to discard it in exchange of the western one, just because the ERP does not implement it (Marble and Lu, 2007). This could be solved including the local business practices by customization of the ERP system (but this may create risk and hinder some benefits) (Marble and Lu, 2007).

In Chinese business culture, organisation is strictly hierarchical (Lockett, 1988). In addition, management is not accustomed to share information with employees; consequently the scope and the progress of a strategic project, like an ERP implementation, are usually unknow to the workforce.

Another aspect of the culture is that management is inclined to act as a father figure to the employees (Marble and Lu, 2007; Martinsons and Revenaugh, 1998). This means that management is perceived to know what is best for the company and that employees should just trust the top decision. The lack of debate and questioning of the leader's decision only enforce the hierarchical position of the management inside the organisation. Everybody under the management lacks the organization "big picture" and goals.

The responsibility is concentrated only in the management position. This is taken to the extreme where the employees do not have responsibility for the result of their work (Martinsons and Revenaugh, 1998). As ERP makes people accountable for what they do, this implies a strong culture resistance from the bottom (Martinsons, 1996).

Chinese business culture views change differently than western culture. The Confucian-derived model of change is cyclical and continuous (Marshak, 1993). The Chinese considers that movement and tranquillity are complementary and occur in a constant ebb and flow without reaching a specific or stable end state (Martinsons and Revenaugh, 1998). Because the culture of radical change is not rooted in the Chinese culture, the past still has a great value and causes a reluctant behaviour to change, hindering innovation. In addition, Chinese employees do not see ERP systems, and Information Technology (IT) in general, as a way to do business. They tend to prefer manual processes or old systems (Srivastava and Gips 2009; Liu et al., 2011) and see the ERP as a way to automate current processes instead of a chance of process improvement.

The language problem should not be overlooked. Several authors highlight the necessity of providing the system and the documentation in Chinese because

only a small part of the personnel is able to understand English (Avison and Malaurent, 2007). Language problem rises the need to adopt certain measures like interpreters or local consultants to impart the training to the user.

China business is characterized by a high degree of collectivism (Hofstede, 1983), meaning that the perception others have on someone has a significative value inside Chinese society. The concept of "*mianzi*" is one of the main constructs. "*Mianzi*" means "face" in Chinese and describes one's reputation or dignity in social context. This translates into a culture that is not prone to address error, especially in public. The traceability of information and transparency of ERP systems poses a threat to this social construct, because the error of an individual can be displayed to the entire organization. For example, ERP implementation usually requires business process reengineering (BPR), thus giving the impression that something was wrong with how the business was previously carried on, threatening the social position of the management. Another possible implication of the "*mianzi*" is the "Asian yes" (Avison and Malaurent, 2007) that is the act of agreeing on something or with someone only on the surface; for example, "Chinese cannot explain their proper need: calling attention to any problem of a business partner is viewed as a direct insult" (Marble and Lu, 2007).

However, Chinese people could follow traditional norms and value in some context, but also display individualism and competitiveness in others (Leung, 2008). Chinese education system promotes competition and hard work. University graduates are extremely competitive because they strive for a better position in society and materialistic achievement (Leung, 2008). Many Chinese now crave for wealth and status and struggle to reach their goals. An example is employee turnover: from basically zero turnover of state-owned enterprises, now the rate of turnover has spiked to the 30% (Leung, 2008). This because people tend to change often their job in pursuit of higher remuneration and social status.

3 METHODS

Giving the exploratory nature of this study, a multiple case study empirical research methodology was adopted (Sousa and Voss, 2001). The sample was composed by two Italian companies that have completed in 2018 the roll-out of the ERP implemented in their Italian headquarters in one Chinese subsidiary. In both cases, the ERP system implemented is SAP. Limiting the analysis to one

ERP brand ensures that the variation in the data is not merely due to variation in the ERP system (Reimers, 2003). Different data collection methods were used, including semi-structured interviews with roll-out project's team members and analysis of companies' documentation. To conduct the semi-structured interviews a guideline for the interviewer was developed outlining the subjects to be covered, the questions to be asked, and the specific data to collect (Voss, Tsikriktsis, and Frohlich, 2002). The data collected have then been analysed in order to identify the main problems experienced by the case study companies and the possible solutions to adopt.

4 RESULTS AND DISCUSSION

4.1 Case A

Case A is an Italian multinational group leader in the sector of automation. The Chinese division was established in 1993 as a private venture between Company "C" and a leading Chinese company in the sector of automation. Since Case A has the objective to reunite all the companies under the same ERP system, it has started multisite phased roll-outs in all its subsidiaries. The previous information system of the Chinese subsidiary comprised two different systems and lacked all the features of an ERP system. The benefits expected from the Chinese roll-out were:

- Replication of the procedures and methods adopted by the other companies of the group.
- Better control of the Chinese business unit from the Italian headquarters.
- Allowing the upper management of the group easier data analysis and cross check.
- Planning of the material with Material Resource Planning (MRP) logic.
- The possibility of the "intercompany flow", i.e. automatic creation of a sales order in Italy triggered by the creation of a purchase order in China.
- Adoption of some custom SAP transactions of the group.
- Automation of the billing process in compliance with the Golden Tax System (GTS), i.e. the Chinese electronic tax administration system.

The actors involved in this project were the CIO and the IT personnel of the headquarters, some business people of the Italian company (like the sales and purchase responsible), the staff of the Chinese company (that represent the key users), the board of directors of the group and external consultants from

two different agencies. The project team was divided by nationality and coordinated by two project managers. The Italian team was responsible to fit of the Chinese company practices to the ERP business model, implement the system, issue the training, provide the documentation and manuals, and support the user during the change of system. The Chinese team was responsible to provide the specifics of their business processes, execute the BPR and learn the logic of the new ERP system.

Difficulties related to national differences, like taxation and legal issues, required the contracting of SAP local consultants for the initial stage of the project. High geographical distance was a problem since the IT personnel of the Italian headquarters could not follow the implementation project on-site.

Also the language was critical. Except some executive staff members, the other Chinese users did not speak English. Therefore, Chinese consultants were contracted to issue training in mandarin. Nevertheless, the users did not completely grasp the logic behind the new business processes and the request of new customisations were fragmented and contradictory.

In addition, one week after the end of the project preparation phase the majority of the Chinese consultants left the project, causing several handover issues and difficulties with users' training.

Several technical problems arose during the final preparation stage and also after the go-live, causing manual corrections and losses of time. Furthermore, the Chinese management requested last-minute changes to the business model already tested and approved. This is probably due to the Chinese habit not to rush to solve problems, but to simulate agreement first even if they do not understand or do not agree upon something, and then do what they think is right.

ERP system was seen as a mean to archive operational transactions instead of using it as an actual business empowerment tool: it was not rare seeing an employee manually solve some problems and then record the result in the ERP.

Nevertheless, the implementation project respected the budget and planned deadline, and the system was getting used correctly by the Chinese users.

4.2 Case B

Case B is a multinational group that produces engine components for tractors and bulldozers. The Chinese division was a small start-up with around 30 workers, all between 30 and 40 years old. The plant director was Italian with more than 10 years of experience working and living in China. The start-up before the project did not have any IT personnel neither an information system. Furthermore, accounting was managed by a third party.

The start-up was organised on the same business model of the Italian plant, so the roll-out project was simplified, because it was not necessary to create a new model and there was no need to perform a BPR.

The decision not to automate the billing process in compliance with the GTS because of the scarce volume of sales to Chinese customers saved time and effort, and reduced the complexity of the project.

During the project some local consultants were contracted, because a few users (i.e. production workers) did not speak English, and Chinese legislation was unknown to the Italian consultants.

The training was issued by local and Italian consultants to the key users. The key users then issued the training to the end-users. The training manuals were make available for consultation months before the go-live, but were entirely in English, because they were the same from the previous international roll-outs. Nevertheless, during the training period significant problems did not arise. Translation related to the system were minimal. It was planned to translate only what was mandatory (e.g. accounting items) and some print-outs for the production workers that did not speak English.

The data conversion step was carried out smoothly, thanks to the limited dimension of the Chinese plant: low number of material codes and little production. The only issue regarding data migration was related to the financial part, but it was just due to a miscommunication between the Chinese accountant and the third party that managed their accounting.

Overall the project was on budget and on time and the user accepted the new system without showing resistance.

The fact that the start-up was comprised mainly of young personnel with a good level of education led to less resistance to change. That was facilitated also by the lack of consolidated habits and previous experiences of information system technologies.

The presence of a plant director that could speak Italian and Chinese helped in the communication of requirements, feedback and instructions, playing the role of a bridge between the two cultures.

4.3 Comparison of the Cases

The two cases present some differences.

The Chinese subsidiary of Case B was modelled after the headquarters business model and this allowed to skip the BPR phase. This was probably

possible because of the relationship between the two: the subsidiary was a recently founded start-up which was entirely under control of the headquarters. This allowed the replication of the models. Instead, for Case A the lack of complete control on the subsidiary and the presence of a Chinese company with half the ownership brought the joint venture to develop different business models than the Italian headquarters. This required the Chinese division to undertake a BPR to partially align itself with the Italian business model.

The subsidiaries of the two companies have different market targets: Case A's subsidiary is focused on Chinese customers, while Case B's has to deal with customers of different nationalities. This might have impacted on two aspects: the first one is the language and the other is the customisation of ERP's interface and forms. Having to deal with international customers, Case B's subsidiary probably hired workers who already possessed good competence in the English language. Instead, the majority of Case A's subsidiary customers are Chinese and so competence in English language might result not mandatory. Also, the fact that most of the customers were Chinese required the development of an interface for the GTS and some print forms in Chinese for the customer, increasing the workload compared to Case B.

Another aspect dealing with the language is the role of local consultants: even if in both the projects local consultants were contracted, in Case A they were contracted to issue training in Chinese to the majority of users and to provide support during the go-live. Case A also experienced the defection of a large number of local consultants, probably as a consequence of the high employee turn-over rate that is characterizing the Chinese enterprise (Leung, 2008). In Case B instead, the number of users who could not speak English was small. Therefore, Chinese consultants were principally contracted to aid the users during the go-live support.

The Chinese culture did not play a relevant role in Case B, while in Case A it created some difficulties in terms of acceptance of the system as a way of doing business and regarding the behaviour of the users ("Asian yes"). This may be related to the interplay of multiple factors: the nationality of the customers, the history of the subsidiary, the mean age of workers, the former IT tools.

4.4 Preliminary Guidelines

Based on the literature review and the main insights from the case studies, a set of preliminary guidelines

for the management of a western ERP roll-out in China are proposed in the following.

4.4.1 Strategy

The strategy for the roll-out must be defined during the planning phase: a clear definition of the level of customization (Mamoghli and Cassivi, 2019), which modules will be rolled out, what are the benefits expected form the project, what is the budget and time committed to the project. Clearly identifying the goals and the objectives helps the organization avoid "scope-creep" and allows monitoring of the project. Consider that customization could increase users' acceptance (Light, 2005). However, customizations of the system that were not planned should be carefully analysed and accepted by the project manager only if aligned with the planned goals and objectives (Grabis, 2019).

4.4.2 Change Management

It is necessary to establish a change management program to smooth the resistance to change of the users caused by their different cultural background: involving user in the project, training, creation of user expectancy, shared documentations and use of leadership to create an organizational culture sympathetic to the ERP system.

4.4.3 Documentation

Having written documentation allows individuals to remain up-to-date with the project: what are the requests, what are the solutions that meet the requests, and what are the changes to these solutions. Documentation must be accessible to the interested actors and updated keeping track of all changes.

4.4.4 Top Management

Top management should sponsor the project throughout the organization increasing users' involvement and commitment to the project. It can also establish an incentive and prize program to reward the project team's members for the realization of the project milestones, goals and objectives.

4.4.5 Team and Language

Communication is negatively influenced by the differences in language between the headquarters and the subsidiary. This complicates processes like training (increased difficulty of the users to understand the logic and how to use the system), the request of changes (risk to misunderstand the requests

of the users, and the answers of the project team) and the BPR. Having project managers with different cultures could be useful to by-pass the communication barriers. One project manager could be the company's CIO, the other should be a subsidiary's key user with project management skills or knowledgeable about that ERP system. In addition, the possibility to implement an ERP system that integrates the Chinese language decreases the resistance of the non-English speaking users (Malaurent and Avison, 2015).

Local consultants can be contracted to be part of the project team and can provide useful information regarding national regulation. They should also be knowledgeable about the ERP system in order to help to develop and test it. Local consultants could improve the relation with the users by eliminating communication barriers. It is recommended to link their retribution to the results of the project and to implement incentives to limit their turnover.

5 CONCLUSION

Based on a literature review and analysis of two case studies, some preliminary guidelines to increase the success of western ERP roll-outs in China have been proposed. However, the small number of cases and the fact that both companies were Italian limit the generalisability of results. Additional roll-out cases should be investigated, possibly including companies from various western countries, to confirm the validity of the preliminary findings and assess also the possible impact of different national cultures.

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