TITLE OF DISSERTATION

The influence of ERP system in enterprises' implementation
– Case study of SAP Software package
adopted in Sany Group

at

THE UNIVERSITY OF SHEFFIELD

by

Lin Tang

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Structured Abstract

Background

Following the discussion in literature review, the history of ERP package software development make the previous authors have deeper understanding in ERP system concept and implementation issues, especially in organizational, technical and culture three aspects.

Aims

This research intend to find the gaps between previous research review and practical investigation through case study, explore key internal barriers that could lead to ERP project implementation face the risks in enterprise, in order to find the potential solutions for ERP system problems.

Methods

The data collection processes will follow semi-structured interview. Based on the observation from ERP literature review and company documents, using qualitative method analyse ERP internal barriers, to explore the system risks that could influence business processes.
Results

Organisational and technical barriers were explored as the major barrier in ERP system implementation in China. Inefficient business integration in ERP project is due to many organisational and technical factors, especially in inefficient departmental commutation and cooperation.

Conclusions

It is concluded that the organizational, technical and culture barriers could lead to ERP project face the risks in different phases. Further research expected that through deeper investigation find more solutions reduce the risks in ERP implementation.
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Chapter 1 Introduction

1.1 Background of the research

Nowadays, in the fiercely competitive environment in businesses processes, many companies expected that following effective IT approaches to support business strategy (Nah et al, 2001). As an important IT innovation, Enterprise Resource Planning (ERP) Systems is the effective approaches to enhance organizational performance through providing end-to-end connectivity (Somers and Nelson, 2001). However, previous research stated that the difficulties and high failure rate in ERP systems implementation (Davenport, 1998). The same problems also relevant to Chinese company, with the competitive environment and economic pressure, increasing Chinese companies have implemented ERP systems (Peng and Nunes, 2008). However, sophisticated tasks make end-user face the challenge in ERP system implementation.

1.2 Research question

What are the main factors influence the ERP software package adaption in China?

1.3 Research aim and objectives

This research project aims to investigate the factors influence of ERP project implementation in organizations. To gain a deeper understanding this study
will carry out a case study in Sany Group to explore the factors that increase the risks of ERP implementation. The research aim attempts to find the gaps between previous research review and practical investigation in the analysis of ERP project in Sany Group, explore key internal barriers that could lead to ERP project implementation face the problems or risks in organization, in order to find the potential solutions.

In order to achieve research aims, the following research objectives are structured in inappropriate methods that involved the influence of ERP adaption in business processes, the list of research objectives show that:

• To review the knowledge of ERP implementation in enterprise
• To identify enterprises’ reasons for ERP adoption.
• To identify the internal barriers of ERP adoption in organizations
• To investigate the consequences that could affect ERP implementation
• To conduct the ontology based on literature review and case study about internal barriers of ERP adoption in enterprise.

1.4 Case Company

Sany Group founded in 1989 as a small welding material factory. It is a Chinese multinational heavy machinery manufacturer headquartered in ChangSha, Hunan Province. Now it has grown into a global corporation with five industrial parks in China, five research and development (R&D) and manufacturing bases in America, Germany, India, Brazil and Indonesia, and 21 sales companies around the world (Sany Group, 2011). Financial Times released the 2011 list of the world’s 500 most valuable companies (FT Global
500) ranked by market capitalization (Dullforce, 2011). Sany Heavy Industry was put on the list of FT Global 500 for the first time, ranked in 431st, with a market cap of 21.584 billion US dollars. Sany has become the first company listed among the world’s top 500 companies in China’s construction machinery industry. Currently, Sany Group employed nearly 60,000 people in more than 150 countries.

The main made products are from concrete, road, port, hoisting, pile driving, excavating machineries and wind energy equipment. Now as one of the successful enterprises in China, Sany Group hold ranks 6th among the top 50 global construction machinery manufacturers (Sleight, 2012).

Tracked the history of ERP system in Sany Group, the adoption of BAAN software package as early as 1999s, meanwhile, as the successful Computer Integrated Manufacturing Systems (CIMS) representative in China, Product Data Management (PDM) systems also had effective implementation. However, in recent years, due to the rapid development of enterprises, product update constantly, the weaknesses of data flow exposed, need advanced and experienced software vendors to improve departmental functions and to improve economic efficiency. Therefore, Sany Group signed a contract with SAP in April 2006, the standards is still valid until now (Sany Group, 2011).

1.5 Structure of the dissertation

In chapter one, it will give the introduction about background of this research, then following the research question to explore research aims and objectives conducting the theoretical framework of this research. After that, the
preparation of case study will be described. Structure of dissertation also will be mentioned in the end.

In chapter two, literature review will start with the history of ERP implementation, then review the concepts of ERP system and its applications, explore the key reasons of ERP implementation in enterprise. Through previous research scanning from organizational, technical and culture three aspects, in order to identify the key barriers and potential risks in previous research.

In chapter three, methodology part will mention about research approach and method first. Using qualitative method and inductive approach to processes this research, then the research strategies in data collection and data analysis will be explained. After that, the data analysis approaches and techniques will be identified. In the end, it will involve the limitation of methodology.

In chapter four, the finding part will focus on the interview contents in focused company, through the investigation in three aspects consist of organizational, technical and culture issues, explore the main barriers in ERP implementation. Ontology about internal barriers in ERP project adoption and usage in case study will be illustrated in the end.

In chapter five, further discussion will mention about the potential risks that caused by internal barriers, exploring the relationships between different barriers, in order to find the key risks influence the business processes in ERP implementation.
Finally, conclusion chapter will give the overall summary for all the research contents, then discuss about research limitation and recommendations, in order to find the approaches in further research.
Chapter 2 Literature review

2.1 Introduction

In this chapter, following the development of enterprise resource planning in the world, previous research identified many reasons of ERP implementation in enterprise. Therefore, it is necessary to explore the key issues that make the ERP project face barriers.

2.2 The development of ERP

2.2.1 The development of ERP in The world

The development of ERP in the world could be tracked back to the 1970s since Information System (IS) is considered to provide effective approaches that supported manufacturer to confirm the material requirements and stock availability. (Loonam and McDonagh, 2005) When arguing about the evolutions of ERP system, Olson and Kesharwani (2010) also emphasised the initial stages in the development of ERP systems. Because of the importance of flow of information for materials and inventory management, Material Requirements Planning (MRP) had been applied generally for supporting business process in organizations. However, the initial application had limitations in the historical evolution of ERP system. Alter (2002) listed three important factors that influence the development of ERP system, including hardware, software and data resources. Caused by these limited factors in initial ERP systems development, the initial stages cannot provide effective approaches to integrate the different functional departments.
Combined with both theoretical evolution and practical improvement in the ERP system, the ERP system designing is not only restrict in single functional area, but also using more comprehensive approaches to integrate the business functional systems. For example, Roberts and Barrar (1992) identified the successful elements in Material Requirements Planning II (MRP-II) implementation, and the influence of ERP system were also broadly analysed by previous researchers. After all, the former generation of ERP played significant role in the development of ERP implementation.

Nowadays, the diversity of ERP system competition is pushing the evolution of ERP system. Various types of ERP system vendors have been implemented in the enterprise processes in the world. According to previous research, the different ERP system vendors served for large amount of wide-users all over the world; these vendors include SAP, Peoplesoft, Oracle, J.D.Edwards and Baan. Within all these vendors, SAP software adoption is the most successful and SAP system vendors had occupied more than 50 percent leading ERP market shares in the world (Burns, 1999; Mabert et al., 2000; Stratman and Roth, 2002; Vaughan, 1996). One of the most successful ERP implementation examples is the SAP R/3 implementation in Colgate-Palmolive. (SAP, 2010).

2.2.2 The development of ERP software packages in China

The inception of China’s ERP market could be tracked from the 1980s when enterprise management staffs make the significant changes from traditional management model to automatic management model in organizations. According to many successful ERP implementation cases in the western countries, the concepts of ERP software are deeply understood by private enterprises and stated-own enterprises in China. With the improvement of the Chinese economic environment, many enterprises are intended to improve
their competitive advantages by adopting ERP system in organization (Peng and Nunes, 2010). In the process of the ERP market development in China, the seriously increase started in 1997 from about 78.4 million dollars to 2002 up to 243 million dollars (Liang et al, 2004). Moreover, the development of ERP market in China also remained annually growing trends between 2002 and 2004 (Xue et al, 2005).

![ERP Market Share and Major ERP Vendor of 1998 in China](image)

Figure 2.1 ERP Market Share and Major ERP Vendor of 1998 in China
Compare the statistics in Figure 2.1 and Figure 2.2, although national ERP system software packages have developed and the dominated parts of ERP Market Share in China changed with increasing of some different vendors such as Kingdee, Digital China in recent years, while none of these can shake the leading status of SAP system in the ERP market in China.

From general to specific area, SAP software package play the significant role in China ERP market. According to Figure 2.1, the most popular ERP software package in China is SAP which occupied 28.7% of market share in China in 1998 (IDC, 1998), and the previous investigation illustrated the importance of SAP software application. Comparing with Figure 2.1, Figure 2.2 illustrated that 34% ERP market share in China was also occupied by SAP in 2009 (IDC, 2009) which indicated that SAP was still the largest software vendor in China. Following the similar viewpoints in recent years, Co-chief Executive of SAP McDermott (2011) evaluated that SAP is the world’s largest
maker of business management software. Therefore, it can be inferred that the development of SAP software package in China in the last 20 years is not incidental. Following the sustainable trends, the development of SAP software will be increasingly adopted in more and more enterprises. Why SAP software package is so popular with private and stated-own enterprises in China competing with other foreign vendors (such as Oracle, JDE) and Chinese vendors (e.g. UFIDA, Kingdee)? Why SAP software can lead ERP market share in China? It is argued that many factors affect enterprises' decision in choosing SAP software. Firstly, as Davenport (1998) identified that in the scope of the enterprise system, SAP’s R/3 package is benefit for the system functions, with the implication of more comprehensive consideration to integrate the data processes for supporting different functional systems including financial system, operational system, logistic system, human resources, sales and marketing systems. In the positive aspects analysis, the SAP’s R/3 package could improve the functional system to be more efficiency and effectively; since the systems are not independently exist and make effects in the organization, the package could provide better facility for the functions between different systems. Therefore, the further arguments will be focused on the detailed purposes for ERP adaption; and the reasons of ERP adaption in enterprise will become the important issue in next section.

2.3 Concepts of ERP system and its applications

Firstly, a survey of the literature traces the main theoretical directions in ERP system concepts. It can be seen that the overall tendency is to focus on what is ERP system. Generally speaking, different forms of business application software are utilized to support end-users in information analysing, storing and delivering, in order to satisfy their requirements (Bocij et al., 2006).
As a product of computer software platform, ERP system is widely utilized for information management and information systems in organization (Gable, 1998). Turban et al (2008) highlighted that ERP software is designed to improve standard business transaction from whole functional department based on Web interfaces, and provide both theoretical framework and practical approaches in enterprises’ activities (Turban et al., 2008). Meanwhile, following with appropriate application, ERP systems provide significant support across the organization among key functional systems such as sales, finance and logistics for both events/transactions as well as record and document management (Koch, 1996). Similarly, Markus (2001) offered useful insights into ERP concepts that, as the commercial software package, ERP system facilitate the integration of transaction-oriented data and business processes throughout the whole organization.

Bocij et al (2006) provided different perspectives in ERP system, ERP applications are not only restrict in simple document management, which can contribute to organization single solution from a single supplier, but also with integrated functions for main business systems from cross the value chain through production, distribution, sales, finance and human resource system. Therefore, ERP system applications cover many different areas including organizational units and coordinate firm activities in business processes. Shehab et al (2004) also supported the opinion that the implementation of ERP system packages is one of the solutions to manage and integrate all functions within the organizations, whereas is more specific on business areas.

Following the previous research in ERP application, Laudon and Laudon (2006) mentioned the functional area and business processes for the separate business functions in ERP project implementation. The functional areas covered different value chain in organization although the ERP applications
are related to many functional areas, the key issue is to construct effective integration across different functional areas aiming for providing contribution to organizational behaviours. Similarly, Turban and Volonino (2010) provided more systemic ERP application modules to evaluate the ERP applications in organizational processes, as shown in Table 2.1 about internal value chains.

<table>
<thead>
<tr>
<th>Functional module management</th>
<th>Business application</th>
</tr>
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</table>
| Supply Chain Management (SCM) | 1. Forecasting  
                                 2. Purchasing  
                                 3. Distribution  
                                 4. Inventory  
                                 5. Collaboration |
| Manufacturing Management | 1. Material requirements planning (MRP)  
                               2. Research and Development (R&D)  
                               3. Work centers  
                               4. Scheduling  
                               5. Maintenance |
| Financial Management | 1. Accounting  
                        2. Cost control  
                        3. Analysis  
                        4. Expense management |

Table 2.1 Internal value chain in ERP application

In summary, ERP systems provided effective approaches to benefit for organizational behaviours, and the core issue of ERP system application in business is to integrate the functional department in organization. Kumar and Hillegersberg (2000) defined that the ERP systems provide powerful information system packages in order to combine information and information-based processes, and both components would then affect functional elements in the process of organizational behaviours. However, according to different business goals in enterprises, ERP implementation could
be focused on different purposes in different organization. Therefore, it is necessary to scan the purposes of ERP implementation in further research.

2.4 Key reasons of ERP implementation in enterprise

2.4.1 Functional integration in value chain

First of all, it is identified that the previous empirical researches mainly emphasized the effective ERP system functions in organizations. Following the illustration in previous parts, Turban and Voloninino (2010) supported that ERP’s major objective focuses on the effective integrations through departments and functional information flows in the enterprise, especially in support internal value chains. Umble et al (2003) proposed that the significant purpose of adopting ERP systems is to improve inventory recording and management styles of companies, which is through integrating approaches to guarantee the inventory management of enterprise. However, Kalakota and Robinson (2000) provided more comprehensive perspectives towards the reasons of ERP systems adoption in organizations, which focused on the platforms or core systems utilized in coalition with business applications for supporting SCM, CRM and e-business tools. Gattiker and Goodhue (2004) also pointed out two important reasons for ERP adoption in the business processes that is using available information to increase productivity and customer satisfaction. Simultaneously, another important advantage in ERP implementation is benefit for HRM. It is argued that ERP module provides appropriate strategies in reasonable schedule and payroll in HRM (Turban et al, 2008). Therefore, the benefits of ERP functions are not only narrow in single area of department in enterprise, but also take consideration in other internal factors in different business processes. Moreover, as the positive factors in previous ERP adoption, the increased efficiency, improved quality
and productivity are also considered as the key reasons to support the value chain in different functional systems (Ragowsky and Somers, 2002). Thus, the key reasons for ERP adaption in enterprise should be evaluated in further research.

2.4.2 Reduce cost

Reducing the cost in business activities is another key purpose through the ERP implementation that attracting many customers. Just as Wang and Nah (2001) pointed that the ERP systems hold the promise of reduce costs. Therefore, the main arguments in this aspect will concentrate on both tangible benefits and intangible benefits.

Nah et al (2001) listed three important tangible benefits from the ERP project implementation, which included inventory reduction, personnel reduction and procurement cost reduction. Meanwhile, it is also pointed that the intangible benefits for reducing cost is also an important factor but often ignored by users. Turban and Volonino (2010) supported that the information errors are being reduced by ERP implementation that means money is saved. Therefore, the potential benefits could be evaluated through the reduction from both intangible cost and tangible cost. Moreover, optimization of resources allocation also is the important factor influence the cost reduction in ERP system implementation (Ragowsky and Somers, 2002).

2.4.3 Summary

Although there are many other reasons influence the ERP implementation in organizations, the most essential factors are to improve functional systems and to reduce cost, both are the key factors that attract customers to improve enterprise competitiveness in the industry.
2.5 Organizational issues

It is suggested that the pre-implementation stage of organization is one of the most important factors in the preparation of ERP system adoption. Although organizations fully covered various elements that relevant to the ERP project of pre-implementation such as project goals, project cost and top management, while departmental communication and cooperation are still the key issues of ERP system implementation.

2.5.1 ERP project goals

Liang et al. (2004) identified cost as one essential problem related to lack of ERP adoption in China. However, the funding problem comes from the high expectation distinction between investment and return. Although top managers understand the importance of fund planning in the ERP pre-implementation, because they are short of effective observation of long-time interest and short-time benefit, tangible benefits and intangible benefits, there come difficulties for ERP implementation process (Bocij et al, 2006). Additionally, as one of the important subjective factor, customer’s experience and knowledge of ERP system should be evaluated based on organizational issues and technical issues. In conclusion, different authors possess different views about the intentions of ERP system application in organizations, the most empirical evidences are primarily based on how ERP system supports business functions, and most of them use comprehensive perspectives and reasonable insights to understand the principle of ERP system implemented in organizations. However, it is pointed that the initial aims of Chinese ERP implementations invariably reflect the need of demonstrate tangible benefits. (Martinsons, 2004) Meanwhile, it is also argued
that ERP project goals should focus on long-term profit rather than short-term benefit.

2.5.2 Cost

Firstly, ERP system implementation cost is an essential factor influence ERP adoption. Bocij et al (2006) pointed out the key shortage of ERP systems is the high costs charged by suppliers and the major organisational change required by implementation of the ERP systems. Therefore, the main arguments surround reasonable budget and timeline of ERP project preparation. Martin (1998) claimed that about 90 percent of ERP projects were not finished on time or charged over budgets, and nearly half of them failed to achieve the satisfactory results. It is considered that the budget and timeline are the two essential factors needed to be paid more attentions when conducting ERP systems in organizations. It is pointed that many ERP projects failed for the reason of lacks of funding, which is mainly because the top managers in the organization are lack of preparations in the pre-implementation processes, for instance. The funding problem is also discussed in the case of FoxMeyer Drug’ Bankruptcy (Computergram international, 1998).

2.5.3 Top management support

However, financial department is not the only determinant when considering the impact of fund issues in the ERP pre-implementation process in organizations; top management, for example, must be deeply involved, which means the ERP adoption processes require largely engagement with top managers’ supports and successful managerial procedures. Due to the subjective and powerful interpretations undermined in the ERP systems, Davenport (2000) points that a successful implementation is only achievable when high-level executives have strong commitments to the project, which
could be affected by the successful case of the ERP implementation before. However, the practical investigation and test should be evaluated,

Using different approaches, Zerega (1997) proved the importance of top management supports based on the successful case study of ERP implementation in an international manufacturer of semiconductors-Fujitsu Microelectronics. Keil et al (1998) considered that from the risk management point of view, it is also related to customer relationships, the key problem has been identified that the failure generally resulted from lacking of senior management commitment. It is clearly emphasized that when the top management make the decisions for conduct ERP projects in organizations can lead to reasonable goals (Ewusi-Mensah, 1997). Particularly, senior management lacking of preparation in allocating valuable resources will restrict the further stages of implementation (Holland et al, 1999).

2.5.4 Communication and cooperation

In comparison with ERP pre-implementation in organizations, this part is more specific on the influence of communication and cooperation from different actors and systems in the processes of ERP. Schwalbe (2000) defined that communication is the motivator which could enhance everything working properly, particularly in the processes of ERP project. It makes reasonable judgement that the interdepartmental communication is the key factor that could affect the process of ERP project implantation in organizations. Following main purpose of ERP project that mentioned in the second part of literature review, poor interdepartmental communication could make negative effects for achieving the organizational goals. The most important aspect of these aspect criticisms come from Parinyavuttichai and Lin (2010) that they pointed the changing of organizational requirements could cause the risk of organizational behaviour. The changing does not mean to renew all the
equipment or function, however, the innovation of information process and new management approaches from ERP project implementation could face challenges as well. Block (1983) made the reasonable arguments that users misunderstand ERP project requirements for changes in organizations could result in organizational structure conflicts among different users. Consequently, how to make customers clearly understand objectives of ERP project and accept it is the most significant issue in departmental communication. Similarly, Scapens and Jazayeri (2003) and Caglio (2003) also discussed that the communication and cooperation between different functional sections is the crucial factor to improve ERP system operation.

On the other hand, Peng and Nunes (2009) mentioned many negative aspects that could influence ERP implementation in internal organizations, such as lack of communications between reengineering team members and other organizational members whom have existed problems in business process with. Typically, when conducting new systems devoted to supporting the business activities, it is also related to internal barriers in the business contexts. Robinson and Dilts (1999) expressed that cooperation and involvement of all participants are critical in terms of ERP systems when facing the cross-functional and cross-departmental boundaries. Therefore, communication is the important factor when appraising the ERP project, which does not only focus on internal entities, but also include external pressure, such as business competitiveness. Thus, how to decrease the negative effects in communication boundaries within the organizations becomes an important issue needed be solved.

2.6 Technical issues

Technical factor also cannot be ignored to be assessed in the successful of ERP system implementation. Many authors have classified this important
issue, which including user’s skills, knowledge and technical support.

2.6.1 User’s skills and knowledge

Peng and Nunes (2008) pointed that a set of systems and technical problems could block the conventional processes in ERP system implementation such as achieving intended functions and performance requirements. Under the investigation of the reasons of failure in ERP project processes, FoxMeyer study, indicated the main reason of the disadvantages of lacking skills and personal knowledge. Within the over 50 ERP consultants at FoxMeyer, many of them were inexperienced and changed jobs frequently (Computergram International, 1998). Bingi (1999) mentioned the importance of technical factors, which means seeking qualified assistants to support the processes of ERP projects turned out more difficult and urgently required in necessary procedures; in another word, specific industry knowledge and good training skills are hugely demanded. Therefore, ERP project cannot ignore the influence of technical factor in whole processes.

2.6.2 Technical support

Technical issues make curial influence in ERP implementation stage. The key factors are about experienced technical expertise support, software and hardware maintenance in the project. Ewusi-Mensah (1997) argued that phenomenon such as the deficient technical expertise and inadequate technology infrastructure for supporting project requirement can lead to time wasting and cost overruns. Similarity, high-skilled ERP experts can support technical approaches for system operation and technical problem (Ifinedo and Nahar, 2009). Gargeya and Brady (2005) also underlined that the technical factor is not the only factor should to be considered; although financial commitment is substantial, but top management such as ERP Project Chief
Executive Officers (CEO) and senior executive teams should also involve in the project. Bingi (1999) considered that the limitation of ERP implementation comes from user’s consideration that it is only related to technical aspects and primarily monitored by IT department. In fact, it is imperative to consider the ERP solution attribute to the integrated approach mobilization like organizational revolution.

In further arguments, top management leading the organizational revolution. As Zerega (1997) argued that the reasonable evaluation of flow of funding and information to the project and the flexible adjustment in the completing process of the project are both important responsibilities for top managers to provide support in ERP project. Similarly, Peng and Nunes (2009) also pointed out that insufficient budgets, funding and top management support could lead to challenge in the EPR project, especially in technical issues. Human resources dispatch also is an important factor in ERP project execution, as the FoxMeyer case identified, that the shortage of skilled and knowledgeable personnel could make negative influences in technical processes, and the inexperienced staff and frequently turnover restrict the functional system (Computergaram international. 1998). If users lack of experience or knowledge in ERP implementation processes, technical risks would occur among functional system integration after project completed.

2.7 Culture issues

The key culture issues involve corporate culture, functional system integration and language culture. The previous researches in these factors also made more comprehensive perspectives in ERP evaluation.

2.7.1 Corporate culture
The influence of corporate culture is inherent in the ERP project implementation. Walsham (2002) pointed out that explanation perspective is from the organizational culture or national culture. Business company culture is a reflection of the sense of value among the whole enterprise. Generally speaking, the longer history the company has, the clearer the employers understand their corporation culture (Somers and Nelson, 2001). However, when the new concepts such as ERP software packages being recommended into enterprise, the organization often has to face new challenges caused by culture barrier.

2.7.2 Business process reengineering (BPR)

Originally, the demand for ERP systems needs useful standard approaches to improve business processes, in order to address changing business imperatives (Earl, 1997). However, the business process reengineering (BPR) could face the challenge face caused by culture barriers.

Obey (2002) et al identified that the conflicts of different cultures in different companies in different areas can be reflected from misalignment between the system and the organizational requirements. It is evaluated that the relative significance of details might come from participate behaviours or organizational culture. In further analysis, the previous ideas from participates could block the ERP implementation in organization, especially from functional system staffs, who could make participates lack of similar creativity consciousness in ERP project implementation. More seriously, they also have inadequate preparation to change their habits in organizational behaviour.

2.7.3 Language
Language barrier is another important culture issue that influences ERP adoptions in many countries especially those are not English speaking countries such as China. Xue et al (2005) pointed out that as the important ERP software adopted in China, SAP’s R/3 implementation becomes a vial issue, which showing that the cultural difference can turn a trivial technical problem into a key concern. Moreover, the language barrier is not only in the processes of implementation, but also exists in staff training process. For further research, Davison (2002) explored the cultural differences by comparing educational ERP implementation between North America and Hong Kong. Therefore, language barriers could cause both theoretical problem and practical difficulty in ERP project in Chinese market.

2.8 Summary

According to criticisms in organizational, technical and culture issues, different barriers could displayed in ERP project through different stages, which would all lead to risks or problems in ERP implementation. Therefore, detailed barriers and consequences data should be collected and analysed in later chapters.

Chapter 3 Methodology

3.1 Introduction

In this chapter, the methodology of this research will be described, which includes discussion on research approach, research method, research strategies, then the detailed procedures of data collection and analysis and will be given; finally, the limitation of this research will be discussed in last section.
3.2 Research approach

There are two fundamental research methods to support a research project. Creswell (2002) supported that whether deductive approach or inductive approach, the essential factors that influence practical criteria is selecting the most appropriate approach to process the research. Therefore, the differences between deductive and inductive approaches are the significant factors affect researcher’s choice. Hakim (2000) illustrated various factors for choosing research approach which are listed in Table 3.1.

Table 3.1 Major differences between deductive and inductive approaches

<table>
<thead>
<tr>
<th>Key factors of Deduction approach</th>
<th>Key factors of Induction approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Scientific principles</td>
<td>• Gaining an understanding of the meaning humans attach to events</td>
</tr>
<tr>
<td>• Moving from theory to data</td>
<td>• A close understanding of the research context</td>
</tr>
<tr>
<td>Explaining casual relationships</td>
<td>• The collection of qualitative data</td>
</tr>
<tr>
<td>Between variables</td>
<td>• A more flexible structure to permit changes of researcher is part of the research process</td>
</tr>
<tr>
<td>• Collecting quantitative data</td>
<td>• Less concern with the need to generalize</td>
</tr>
<tr>
<td>• The application of controls to ensure validity of data</td>
<td></td>
</tr>
<tr>
<td>• The operationalisation of concepts to ensure clarity of definition</td>
<td></td>
</tr>
<tr>
<td>• A highly structured approach</td>
<td></td>
</tr>
<tr>
<td>• Researcher independence of what is being researched</td>
<td></td>
</tr>
<tr>
<td>• The necessity to select samples of sufficient size in order to generalize conclusions</td>
<td></td>
</tr>
</tbody>
</table>

According to description in Table 3.1, there are three reasons to choose inductive approach in this research. Firstly, comparing with deductive
approach, inductive approach underlined that research starts from a series of researcher’s observation that close to research context. Therefore, it is easier for experienced researcher to choose this approach. As Yin (2003) indicated the inductive approach could be a difficult strategy to follow and may not lead to success for someone who is an inexperienced researcher. Therefore, the researcher needs general and previous observation in specific domain. Then based on the object of research is specific domain, the research could formulate the research questions to test these ideas, in order to identify relationships between data, research questions and propositions. Moreover, the inductive approach is more specific on the meanings from both people and events in human’s activities, and the data collection processes following specific area conduct the interview.

3.3 Research method

Guba and Lincoln (1994) identified that both qualitative and quantitative method are the appropriate methods that could support different research paradigms. Many authors distinguished the differences between qualitative and quantitative research. (Bryman, 1989)Quantitative method is predominantly utilized as a synonym for any data collection technique, such as questionnaire or data analysis procedure such as graphs, statistics and used numerical data (Frankfort-Nachmias and Nachmias, 2008). By comparison, interview as the important data collection techniques of qualitative method, follows with data analysis procedure using non-numerical data, such as pictures and video clips (Baryman and Bell, 2003). Besides, qualitative method can be used to analysis subjective values, viewpoints and perceptions from people, in order to create or improve observation from previous theory.
So based on the data collection process using interview method and qualitative analysis procedure in this research, this study will utilize qualitative method.

3.4 Research strategy

3.4.1 Case study

Yin (2003) pointed that a case study is an empirical research that explores a contemporary phenomenon within its real-life context especially when the gaps between phenomenon and context are not clearly identified. Therefore, the gaps between theory and phenomenon in this research should be solved. According to the characteristics of ERP implementation in organization, researcher will use company document forms to make general observations in company background, and then conduct the interview in specific domains in order to explore existing theory. Thus, case study is the significant research strategy in qualitative method that fits this research project.

3.4.2 Grounded theory

When researchers choose qualitative method doing a research, their goal is to falsify, modify or provide support for existing theory, which usually involving a process called analytic induction (Frankfort-Nachmias and Nachimias, 2008). Fundamentally, following the processes of data collection, researchers would formulate hypotheses and test their hypotheses using the collected data and attempt to develop existing theory, in order to conduct the data analytic strategies of grounded theory (Bryman, 2008).

It is most accurately described as a research method which the theory is developed from the data, rather than the other way around. It is an inductive approach, which means that it moves from specific question to more general
and clear observations. The research method consists of three factors: concepts, categories and propositions, or what was originally called "hypotheses" (Glaser and Strauss, 1967), but new theoretical framework are the key factors of analysis since the theory is developed from the conceptualization of data, rather than the actual data.

3.5 Data collection

Based on the qualitative method in data collection, the data collecting processes will be interview. There are three types of interview that are usually classified as structured interviews, semi-structured interviews and unstructured or in-depth interviews (Saunders et al 2009).

Structured interviews use questionnaires based on set of questions, following structured questions to build social interaction between researcher and participants. As described, structured interviews use quantitative approach to collect data. In comparison, both semi-structured and in-depth interviews are referred to qualitative research interviews (King 2004). The difference between semi-structured interviews and structured interviews is that when using semi-structured interview, researcher will usually have a list of themes and questions cover the research domain. Meanwhile, the focused groups could also provide a specific organizational context that relates to research topic. Comparing with structured interviews, semi-structured interviews depend on flow of the conversation. The question design is more flexible and easier to get extensive perspectives from participants. In addition, unstructured interviews follow informal approaches to explore a general area in which researcher are interested in depth (Easterby-Smith et al, 2008). Therefore, following feature and scope of these three research approaches, semi-structured interview is more appropriate in this research. As mentioned before, structured interviews are formally designed and standardized in the
processes of gather quantitative data. In different way, semi-structured and in-depth interview are normally applied to gather qualitatively data, such as in case study, the questions could be more open and related to topic. Therefore, this research will focus on non-standardized interview form. Because of time schedule and geographical reason, it combines three methods in conducting the interviews, which include face-to-face interviews, telephone-interviews and internet interview.

The semi-structured interview will involve 12 participants in Sany Group about SAP software package implementation. Within these participants, there are top managers, financial department staff, IT expert, production department staffs and in-house ERP consultants, specific on subjective perspectives from department staffs and in-house ERP consultants. Before connecting with relevant participates, the author has to get access in enterprise for accepting face-to-face interview. In the semi-structured interview, the interview contents are relevant to ERP system implementation in Sany Group, which involve five aspects: purpose, factors, problems, influences and consequences about ERP project implementation. The following list indicates the details about the interview factors:

(1) Previous development of ERP in enterprise

(2) Personal understanding of the concept of ERP

(3) The influence of ERP system in business processes

(4) Problems related to the business processes

(5) Causes and consequences of the problems

The interviews are based on the opening questions such as “could you please talk about your opinion about ERP system implementation?” in order to
encourage participates to reply their opinion as they wish. As Grummitt (1980) pointed that an open question is designed to encourage the interviewee to provide extensive and developmental answer relevant to themes. Meanwhile, reliability and validity are the both the important issues for interview contents (Easterby-Smith et al, 2008). Therefore, researcher should use appropriate language and knowledge to control the interview. In addition, preparation of interview contents is the essential factor to support the data collection processes, such as background of enterprise, personal knowledge structure and confidents of researcher. According to this view, the background of enterprise is related to interviewee’s positions in enterprise. Here lists the position of all interviewees:

<table>
<thead>
<tr>
<th>Position</th>
<th>Number of people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management staff</td>
<td>2</td>
</tr>
<tr>
<td>In-house ERP consultant</td>
<td>4</td>
</tr>
<tr>
<td>IT expert</td>
<td>1</td>
</tr>
<tr>
<td>SAP module consultants</td>
<td>2</td>
</tr>
<tr>
<td>Project manager</td>
<td>1</td>
</tr>
<tr>
<td>Departmental Director</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 3.2 Position of interviewees

3.6 Data analysis

Based on understanding of case study and grounded theory strategies, this research analytical procedure will start with research question and research objectives, following with get familiar with the interview contents and make the note to transcription and highlight the key issues that related to themes. After
that, the important procedure is coding, with the application of Computer Assisted Qualitative Data Analysis Software (CAQDAS) package Weft QDA to process transcription analysis, decoding and text interpretation (Lewins and Silver, 2007). Figure 3.1 showed that the interface of Weft QDA. It is emphasized that the benefits of CAQDAS package is that even the basic ways of using CAQDAS programs can facilitate qualitative data analysis to become more effective and efficiency. According to the framework of CAQDAS package, the functional areas related to structure of working out of data relationship, exploring the data, coding and retrieving search and interrogating, notes taking and comments writing. Therefore, proper interface setting could arouse functions of this type packages which makes analysis procedures become more rapid than other approaches; simultaneously, Weft QDA are for free. Therefore, this is a useful technical tool to facilitate data analysis processes. According to the functional interface, open coding will be used to disaggregate data into units and provide each unit a label. The different types of labels will add into different units of data.

The advantage of inductive approach is to derive meaning from the subjects and settings learned, such as a unit of data related to a few words, a line, a sentence or a number of sentences in interview contents (Saunders et al, 2009). The emphasis point in this approach is that the researcher should care about the understand meanings and generate categories to encompass from researcher’s early analysis which focused on looking at smaller units of data. Meanwhile, the key point of getting better result is that multitude of code labels will need to be compared and placed into broader and closer meaning to themes. Therefore, the processes of classify codes are based on potential themes, in order to find the relationships between different codes, such as reasons or consequences that related to ERP problems. Then it follows with the step of conducting the ontology about ERP system internal barriers.
Figure 3.1 showed that the interface of Weft QDA

![Design Theme Diagram](image)

- **Design Theme**
- **Code problem**
  - **Code cause**
  - **Code consequence**
- **Generalize Ontology**

Figure 3.2 Mind map to generalize the procedures of data analysis
3.7 Limitation

Due to the fact that focused participates are all from Chinese enterprise, the interview contents could face the problem of some translate errors in English presentation. Therefore, it could influence the quality of quotations in finding chapter.

Moreover, as I mentioned about in the processes of interview structured in this chapter, because of schedule and geographical problems, the interview process has to use three forms: first is getting access in doing the face-to-face interview with some of participants in the enterprise, then contacting with other participates in different way, through telephone, e-mail and social media method, using both telephone and internet interview methods to complete the interview. Comparing with face-to-face interview, these methods would miss gesture language when communication with participants which might influence the results because gesture language could make participants more clearly understand about the meaning and background of the questions and help researchers easily understand the reply of participants with possible intimated meaning (Frey and Oishi, 1995).
Chapter 4 Finding

4.1 Pre-implementation stage

4.1.1 (OB) Organizational barriers

Short-term thinking

Clear objectives and goals are the essential factors influence the implementation of ERP system in ERP pre-implementation stage. Many previous ERP projects have failed because of the unrealistic ERP planning in pre-implementation stage. (Holland et al, 1999).

There are three main situations may cause negative impacts in the ERP project planning. Firstly, different viewpoints between long-term interests and short-term benefits often make top managers confuse. Although subjective expectations of top managers mainly focus on achievement in both aspects, the practical situation could be more inclined to short-term interests, especially in cost reduction in business processes such as one of the interviewees said:

…Actually, according to the successful cases of ERP project implementation in the world, we are looking forward to reducing the cost and improving the competitiveness with the help of ERP software package. Based on the feature of manufacturing industry, the main cost comes from material. Therefore, reducing level of inventory and obtaining more flexible funding space become the key factors in ERP system adoption… (Top management staff A)

As discussed above, intangible benefits in ERP implementation could be ignored by top managers in long-term thinking, such as conducting effective communication between different functional systems (Wee, 2000). Therefore,
lack of deeply understanding in ERP adaption could influence the planning from top management, even to the extent the technical issues.

**Unreasonable evaluation standards**

Secondly, unreasonable ERP system standard could also cause negative influences in pre-implementation stage. Based on the competitive environment in business area, the rationality of ERP planning should be evaluated. The arguments are around the formulation of ERP performance inspection standards, which involves both practical situation in functional system assessments and top management encouragement. As one of the participants comment about the performance inspection:

……In my opinion, although ERP system performance inspection standards is the effective approach to supervise and examine the influence of ERP implementation, while the formulating processes of ERP performance inspection standards lacks of detailed and systemic investigation in different departments. Meanwhile, the positive attitudes from top management to each department staff in ERP project implementation could affect the requirements of performance inspection …. (Internal ERP project consultant A)

Therefore, the assessment of ERP planning formulation makes significant role in ERP pre-implementation stage (Sumner, 1999). In further analysis, although performance inspection provides fixed standards to evaluate the ERP implementation in order to get insight of the achievement in ERP implementation, however, it could result in the situation with shortage of scientific approaches to measure the functional system. Based on statistics collection processes from different functional departments, whether to improve the tangible benefits in department or not has been considered as an important element for assessing ERP project adoption. Therefore, if the statistics cannot reach the expectations of performance inspection, it will become the
important factor that cause negative influence in top management decision in ERP project, such as decreasing confidents and investment in ERP implementation. Simultaneously, how to measure the intangible benefits of ERP implementation is another important issue should be solved, which shows that only using quantitative method to investigate the practical effects in ERP implementation is unreasonable. Hence, unreasonable ERP planning reflects top management lacking of experience and knowledge in ERP implementation (Holland et al, 1999). Following the unreasonable ERP planning in pre-implementation, it could lead to potential risks in the processes of ERP implementation. The negative influences could also involve the functional systems integration. Further investigation and discussion will be around these issues in implementation stage.

Unreasonable budgets

In another aspect, ERP project budget is also an important factor that influences the top management thinking about ERP project adoption (Falkowski et al, 1999). Unreasonable budget could make the ERP project confront financial risk, just as shown in the case study of FoxMeyer Drugs (Computergram International, 1998). In the processes of data collection, two of interviewees also mentioned that:

……We invested a lot of funds, time and human resources in the processes of training staff before. However, the effect of training lacks of assessment …. (Top management staff)

….According to limited human resource and funds for us, we cannot reach the requirement of ERP system and hardware maintenance for each month….. (Technical expert)
Therefore, the unreasonable budget could cause negative effects in the processes of ERP implementation, especially in scheduling resources in ERP project. Meanwhile, it could also lead to technical risks in system operation.

To sum up, according to the interview contents, three main barriers in pre-implementation stage have be explored, which include short-term thinking, inadequate schedule and unreasonable budgets, and this might be caused by the limited experiences of ERP users. In addition, the potential threats could extend to further stages.

4.1.2 (TB) Technical barriers

Lacks of technical support from experts

The preparation of ERP project is not only related to organizational factors, but also involves technical factors. Especially with technical support, technical expert makes significant role in ERP implementation (Sumner, 2000). As two of the SAP module consultants described about their responsibilities in the enterprise:

…..My job is popularizing SAP modules’ knowledge in different departments, making users deeply understand ERP system functions and training staff in practical operation. Meanwhile, another important responsibility is solving the technical problem in functional system….. (SAP module consultants A)

……..My main responsibility is training staff about basic ERP knowledge, which focuses on the problems that staff could find in ERP system application, combines both theoretical knowledge and practical guidelines in order to make user’s understand the purpose of ERP project and improve their skills in the processes of system operation ...... (SAP module consultants B)
Therefore, based on the data collected from ERP consultants, it can be found that the role of technical experts offers both theoretical and practical approaches to support ERP project implementation. However, the serious problem is lacking of experienced in-house ERP project consultants for preparing ERP project, as one consultant said that:

…….We have a lot of tasks to do. Sometimes we need to face technical problems in different departments at the same time. Therefore, those problems cannot be solved efficiently. Moreover, although top management invests more funds, time and human resources in training staff, the experienced expert should still be evaluated. In my opinion, the experienced ERP consultants should accumulate three or more years’ experiences in ERP project implementation. To be honest, part of our consultants cannot reach this requirement. On the other hand, based on financial issues, top management could not invest enough funds for preparing in-house consultants in order to support ERP project implementation….. (In-house ERP project consultant D)

Lacks of initial test

Another technical barrier is from lacking of adequate initial tests in ERP system adoption. Attributed testing as primary factor for successful ERP adaption is a sophisticated task in pre-implementation stage, but companies often ignore the importance of functional system testing (Rosario, 2000). Following is the interviewee’s description:

…….In my opinion, our top management has high expectation in ERP system adoption. However, because of timeline and subjective factors in pre-implementation, we don’t have adequate time and resources to test in different functional systems. In order to find the problems that might happen
in ERP implementation, reduce the risks when the ERP project carry out, we have to divide the ERP implementation into two parts. Project implementation is the first step, after that any problems found should be improved in different functional systems; we describe this step as improving the quality of ERP implementation. The important technical issue is that we need more funds and in-house experts to contribute to second step… (In-house ERP project consultant C)

Therefore, lacking of adequate test could threaten the technical operation and increase cost in ERP planning. However, this issue is not usually considered as an important issue that solved by top management in ERP pre-implementation.

4.1.3 (CB) Culture Barriers

**Corporate culture**

The investigation of culture barriers is mainly around two issues in ERP implementation, which are different corporate culture and language culture. Although the corporate culture inherently exists in organization and could not be easily changed, the requirements of ERP project ask for some changes in organizational culture, such as business strategies and operational processes (Roberts and Barrar, 1992). Further analysis shows that it depends on organizational strategies in ERP implementation. Therefore, top management has significant responsibility to match the business strategies and ERP implementation planning. In practical investigation, business strategies and ERP implementation planning sometimes have conflicts between each other, like one of staffs from top management said in the interview:

….Based on the features of manufacturing industry, our business strategies focus on reducing product lifecycle, improving production efficiency and
reducing cost in business processes. The formulation of ERP planning should obey the production and order first…. (Top management staff A)

Therefore, because the business strategies have to follow organizational features and business processes in specific industry, the culture barriers could influence the ERP project planning. In fact, the different goals between ERP planning and business strategies are to be evaluated in further stage, because the feature of ERP systems is different. One of the ERP consultants described about ERP system features as:

……ERP systems provide standard approaches to integrate different departmental functions, but should have relevant participants involving in the functional system integration….. (In-house ERP consultants C)

Comparing with these two perspectives, the influence caused by corporate culture could influence participant’s behaviors in ERP implementation.

**Language culture**

Other than organizational culture issue, language barrier is another issue in ERP pre-implementation (Xue et al, 2005). Based on the development of ERP system adoptions in the world, developed countries provide the experiences and theoretical guidance in training staff. However, the English documents could make ERP experts and staffs confuse in the processes of training staffs in non-English speaking countries such as China, as one of SAP consultant said:

……Based on the development of SAP software package in the world, the history of SAP project could be tracked to German company who have the most experienced experts in SAP software package implementation. Luckily, we have cooperation with them and they can provide professional SAP consultant for us on staff training and in-house consultant. However, caused
by our staffs’ English level, we cannot reach their requirements and this planning just be ignored. In addition, some experienced documents and articles are also provided to us for staff training, but we need professional translator to translate resources into our native language. (In-house ERP project consultant D)

Therefore, language barrier makes serious problem in ERP system knowledge and experience popularization in organization. It could make users lacks of interests in understanding of ERP project implementation which would become potential risk in further implementation process since they cannot adequately involved in the whole ERP project because of poor understanding of the process.

4.2 Implementation stage

4.2.1 (OB) Organizational Barriers

Inefficient departmental commutation and cooperation

The influence of ERP pre-implementation could then extend to implementation stage. Based on analysis in pre-implementation stage, effective and efficient communication and cooperation between different functional departments is the key factor in successful ERP implementation (Schwalbe, 2000). However, the main challenge is from interdepartmental interests and responsibilities in ERP project implementation stage.

Firstly, top management still makes the most significant role in ERP project implementation platform. The role of top management in ERP implementation is to coordinate different functional system relationships, including their interests, responsibilities and human resources schedules (McKersie et al, 1991). It is supposed that the influences of lacking of coordination between
different departments are often caused by inexperienced top management; just as one of the interviewees described:

....In order to assess the influences of SAP software package implementation, our IT department and financial department formulate the documents of Performance Inspection to supervise different SAP modules implementation, which consider Performance Inspection as the standard to evaluate the departmental functions quarterly. Therefore, our department staffs have large pressures in their job. However, because of external sales environment changes, the problem comes from gaps between standards and practical statistics since these two factors influence the accuracy of ERP system data. Moreover, based on system functions in different departments, functional business processes integration should go across different departments. The conflicts could be caused by departmental interests and more tasks in system functional integration.... (SAP project manager A)

So the reason of departmental conflict is from unreasonable standard to evaluate functional system which is related to high expectations from top management in ERP planning (Hoffer et al, 1998). Simultaneously, it could lead to departmental staffs with large pressures in ERP project implementation. If they do not have enough confidents in ERP implementation, it could affect the data accuracy. In addition, the quality of information does not only depend on top management expectation, but also related to interdepartmental interests and responsibilities in different functional system (Stefanou, 1999). As one of SAP module consultants said:

.....In SAP software package records, different departments focus on different records from different modules. For example, In Finance Controlling (FICO) modules, the financial department more focuses on data flow which can match the practical cost and sales, but production department emphasizes the data
flow processes following requirements of product plan in Materials Management (MM) module. It is usually caused by unreasonable Performance Inspection. Therefore, the serious problem comes from the situation that product order records cannot match practical production in MM module..... (SAP module consultant A)

Figure 4.1 Rich picture for illustrating the example in internal data flow processes

Following the rich pictures shown in Figure 4.1, the conflicts exist among different departmental actors, so the interdepartmental data records need to
be adjusted. Following large pressures from top managements’ influence and no clear responsibilities from staffs, data flow error or delay between functional systems in business processes are the significant issues relevant to ERP implementation.

4.2.2 (TB) Technical barriers

User lacking of knowledge and skills in ERP implementation

In the ERP implementation processes, user’s knowledge and skills are the important factors to affect the ERP system operation (Holsapple, 2003). Following the preparation in ERP planning, ERP consultants have responsibility to train staff. However, the problem is caused because department staffs are lack of experiences and basic knowledge in training processes (Crowley, 1999). The following technical barriers will influence the processes of ERP implementation. One of SAP modules consultants described two technical issues they met:

.....Our Sales Distribution (SD) module provided the appropriate method to track sales records. Three main functions are listed there:
• According to virtual warehouse, tracking in-transit stock
• Tracking sales situation
• According to sales order analysis cost and sales

However, because parts of our sales department staffs are lack of understanding in modules and just use it as the data record tool, therefore, the multiple functions in SAP module cannot benefit more for our business processes...... (SAP modules consultants A)
In further analysis, two reasons might cause ERP system cannot support business processes sufficiently. Firstly, users lacking of understanding in ERP systems could relate to personal knowledge structure and experiences in IT operation. Moreover, lacking of in-house expert support could lead to more technical problems in ERP system implementation, especially in system integration (Bingi, 1999). One of In-house ERP consultants said that:

…Although we engaged some experienced ERP consultants, while because of personal issue, our experienced consultants are turnover frequently…..
(In-house ERP consultants C)

4.2.3 (CB) Culture barriers

Culture differences in IM

As mentioned in ERP pre-implementation stage, because of the history of ERP system development, training problems also exists in foreign EPR software package implementation as users lacking of understanding in ERP implementation could relate to translation barriers (Davenport, 1998). The culture barriers lead to user lack of involvement in system operation. Because of their limitation of knowledge and experience, the culture differences make them not able to reach ERP requirement. One top management staff described that:

…..How to evaluate our system is an important issue. According to successful case in Japanese manufacture industry called Lean Production, they follow this concept in functional system, achieve multiple and effective production in business processes. However, the practical situation cannot reach this goal… (Top management staff B)
On the decision making level, top management could absorb previous experiences and successful cases. However, if only using previous model and standards in practical ERP project, the culture barriers could emerge in ERP system operation.

4.3 Post-implementation stage

4.3.1 (OB) Organization barriers

Inefficient top management scheduling

According to ERP planning formulation, it is necessary to formulate emergency measures for the problems might happen after ERP implementation. However, according to inadequate user involvement and short of top management support, it could cause lack of timely feedbacks in ERP system problems (Holland et al, 1999). Then, top management and in-house ERP expert cannot solve the problems on schedule. On the other hand, because of budget problems, top management staffs often ignore the functional system improvement, just as one of in-house ERP consultants said:

…We know about system weaknesses after implementation; meanwhile, we gave suggestions to top managers who can use human resource and funds to improve it, since many details related to technical issues…… (In-house ERP consultants C)

4.3.2 (TB) Technical issues

Inefficient solutions for system problem

Software and hardware maintenance is an important issue in IT project post-implementation stages (Peng and Nunes, 2008). However, as
mentioned before, top management support and reasonable ERP planning are the important factors in technical operation and the practical problem, just as one of technical experts said that:

……Based on our responsibility, our software and hardware maintenance should be quarterly. Therefore, the technical problems in quarter should go through top management urge and funds support. So the technical problems such as computer problem, software and hardware update will follow top management instruction with clear relevant document form….. (Technical experts)

Therefore, lacking of top management support and reasonable ERP planning could make negative impact on IT maintenance.

4.3.3 (CB) Culture barriers

Lack of understanding in Business Process Reengineering (BPR)

The user involvement goes across different stages in culture issues. Because quality of business process review and redesign are important, conflicts between user’s subjective attitude and new ERP system package functions in Business Process Reengineering (BPR) could affect ERP system development in enterprise (Rosario, 2000). One departmental director said that:

……We used both BAAN and SAP software package before, and the improvement of EPR system makes our business processes more efficient. However, some of staffs cannot understand why we should make the changes…. (Departmental Director A)
In consequent, lacking of understanding in BPR could lead to staffs less involvement into ERP project. The negative attitudes from department staffs could make the functional system integration confront problems.

4.4 Ontology about internal barriers in ERP project adoption and usage in case study

In general, the different barriers exist in all processes of ERP project implementation. Here uses Table 4.1 to illustrate the detailed barriers.

Table 4.1 The detailed barriers in all processes of ERP project implementation
<table>
<thead>
<tr>
<th>(OB) Organizational issues</th>
<th>(OB1.1) Clear goal and objectives</th>
<th>(OB1.1.1) Lack of clear goal between long-term interests and short-term interests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(OB1.1.2) Subjective expectation from top management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(OB1.1.3) Lack of reasonable budgets in ERP pre-implementation</td>
</tr>
<tr>
<td></td>
<td>(OB1.2) Top management support</td>
<td>(OB1.2.1) Lack of understanding in ERP software application</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(OB1.2.2) Lack of leadership and supervision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(OB1.2.3) Lack of scheduling</td>
</tr>
<tr>
<td></td>
<td>(OB1.3) Departmental communication and interdepartmental cooperation</td>
<td>(OB1.3.1) Inadequate information flows between different departments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(OB1.3.2) No clear departmental responsibilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(OB1.3.3) Lack of accuracy and timeliness in information flow processes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(OB1.3.4) Lack of cooperation from different department staffs</td>
</tr>
<tr>
<td></td>
<td>(OB1.4) ERP project consultants</td>
<td>(OB1.4.1) Lack of In-house specialists</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(OB1.4.2) Experienced consultants turnover frequently</td>
</tr>
<tr>
<td>(TB) Technical issues</td>
<td>(TB1.1) User's technical knowledge</td>
<td>(TB1.1.1) Lack of basic IT and IM knowledge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(TB 1.1.2) Lack of understanding in ERP project purposes and knowledge</td>
</tr>
<tr>
<td></td>
<td>(TB1.2) Technical support</td>
<td>(TB1.2.1) Lack of initial tests in ERP adoption</td>
</tr>
<tr>
<td></td>
<td>(TB1.3) System maintenance</td>
<td>(TB1.3.1) Lack of hardware maintenance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(TB1.3.2) Lack of regular maintenance in ERP system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(TB1.3.3) Lack of effective approaches response hardware or software problems</td>
</tr>
<tr>
<td>(CB) Culture issues</td>
<td>(CB1.1) Corporate culture</td>
<td>(CB1.1.1) Different departmental requirements in ERP systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(CB1.1.2) Culture differences in IM</td>
</tr>
<tr>
<td></td>
<td>(CB1.2) Business Process Reengineering</td>
<td>(CB1.2.1) Inadequate preparation in Business Process Reengineering</td>
</tr>
<tr>
<td></td>
<td>(CB1.3) Language barriers</td>
<td>(CB1.3.1) Translation barrier in training processes</td>
</tr>
</tbody>
</table>
4.5 Summary

To sum up, interview contents are from case study in Chinese enterprise. Although the development of ERP market in China grows rapidly, and most customers have successful achievement in ERP project implementation, while some internal barriers still restricts the development of ERP system adoption in China, especially in organizational, technical and culture aspects. So the following problems will go across different stages in ERP implementation, and the risks from ERP barriers will be evaluated in further discussion.
Chapter 5 Further Discussion

5.1 Introduction

In this chapter, according to different barriers in ERP system implementation, further discussion will focus on the risk due to organizational, technical and culture barriers, in order to explore the risks from ERP implementation barriers. Meanwhile, clear relationships between different barriers are also required to be discussed.

5.2 The Risks in ERP implementation

Firstly, the initial planning is the key factor leading the ERP project since many failed ERP projects is due to unrealistic ERP planning. ERP planning failure is caused by many factors, such as external environment change, culture differences and so on. However, top management have the responsibility of formulating the ERP planning. If they are lack of understanding in reasonable ERP planning, then ERP implementation cannot achieve the business goals. Meanwhile, unrealistic ERP planning could lead to other risks in internal organization, such as further discussion below about conflicts in different department. Table 5.1 lists the risk that cause by the factors of unrealistic ERP planning from top management.

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>(OB1.1.1)Lack of clear goal between long-term interests and short-term interests</td>
<td>Formulate unrealistic ERP planning</td>
</tr>
<tr>
<td>(OB1.1.2)Subjective expectation from top management</td>
<td></td>
</tr>
<tr>
<td>(OB 1.1.3)Lack of reasonable budgets in ERP pre-implementation</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.1 Factors related to top management lead to unrealistic ERP planning
Secondly, further discussion also focuses on the relationship between different departments. Unrealistic ERP planning could lead to chain reaction fall into other risks including the conflicts between different departments which is one of the most difficult problems to solve. However, this risk is not only related to top management, but also dependent on practical situation in different departmental ERP implementation. Table 5.2 lists main factors leads to different department staffs have conflicts in ERP system implementation.

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>(OB1.1.2)Subjective expectation from top management</td>
<td>Conflicts between different functional systems</td>
</tr>
<tr>
<td>(OB 1.1.3)Lack of reasonable budgets in ERP pre-implementation</td>
<td></td>
</tr>
<tr>
<td>(OB 1.2.2)Lack of leadership and supervision</td>
<td></td>
</tr>
<tr>
<td>(OB 1.2.3)Lack of scheduling</td>
<td></td>
</tr>
<tr>
<td>(OB1.3.4)Lack of cooperation from different department staffs</td>
<td></td>
</tr>
<tr>
<td>(CB1.1.1)Different departmental requirements in ERP systems</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.2 Main factors leads to different department staffs’ conflicts in ERP system implementation

Basically, majority of ERP risks are due to subjective behaviors from participants. It is relevant to actor’s experiences and knowledge structure about ERP planning. If they do not have enough experiences or knowledge, department staffs cannot reach ERP requirement. Therefore, the serious problem might come from part of department staffs unwillingly involve in ERP implementation which increases the pressure in ERP implementation. Table 5.3 lists the main barriers relevant to lower user’s involvement.
<table>
<thead>
<tr>
<th>Barriers</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>(OB1.1.1)Lack of long-term interests and short-term interests</td>
<td>Low user’s involvement</td>
</tr>
<tr>
<td>(OB1.2.1)Lack of understanding in ERP software application</td>
<td></td>
</tr>
<tr>
<td>(OB 1.4.1)Lack of In-house specialists</td>
<td></td>
</tr>
<tr>
<td>(TB1.1.1)Lack of basic IT and IM knowledge</td>
<td></td>
</tr>
<tr>
<td>(TB 1.1.2)Lack of understanding in ERP project purposes and knowledge</td>
<td></td>
</tr>
<tr>
<td>(CB1.3.1)Translation barrier in training processes</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.3 The main barriers relevant to lower user’s involvement

Moreover, within the purpose of ERP implementation, another main function is integrating the business processes. However, the situation that different modules in ERP system cannot seamlessly integrated is an important issue that limits the ERP project development, especially with ineffective functional integration across different departments. Therefore, the practical barriers in operation could lead to inefficient business integration between different departments. Thus, Table 5.4 lists the detailed reasons for the inefficient business integration.

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>(OB1.3.1)Inadequate information flows between different departments</td>
<td>Inefficient business integration</td>
</tr>
<tr>
<td>(OB1.3.2)No clear departmental responsibilities</td>
<td></td>
</tr>
<tr>
<td>(OB1.3.3)Lack of accuracy and timeliness in information flow processes</td>
<td></td>
</tr>
<tr>
<td>(TB1.2.1)Lack of initial tests in ERP adoption</td>
<td></td>
</tr>
<tr>
<td>(CB1.2.1)Inadequate preparation in Business Process Reengineering</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.4 Detailed reasons for inefficient business integration
Finally, technical barriers often make the users face difficulties in ERP implementation. Consequently, if top management support or in-house specialists cannot make the positive effect in ERP system application, system problems could result in potential threat in the project, which will also increase more costs in ERP project. The following table lists the main technical factors could lead to functional system failure.

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>(TB1.2.1)Lack of initial tests in ERP adoption</td>
<td>Failed in functional system application</td>
</tr>
<tr>
<td>(TB1.3.1)Lack of hardware maintenance</td>
<td></td>
</tr>
<tr>
<td>(TB1.3.2)Lack of regular maintenance in ERP system</td>
<td></td>
</tr>
<tr>
<td>(TB1.3.3)Lack of effective approaches response</td>
<td></td>
</tr>
<tr>
<td>software problems</td>
<td></td>
</tr>
<tr>
<td>(OB 1.4.1)Lack of In-house specialists</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.5 Main technical factors could lead to functional system failure

5.3 Summary

Although the development of ERP market in China is rapid, the internal barriers still restrict the ERP implementation, especially in business integration. In summarize, business integration is the key issue in ERP project, which might result from different barriers including organizational issues, technical and issue culture issue, and these factors will lead to ERP implementation facing different risks in different phases.
6 Conclusion

6.1 Introduction

In this chapter, the conclusion of whole research contents will be presented, the overall conclusion will focus on how to achieve research aims and most significant findings in this research. After that, stated the possible limitations in this research. Finally, the recommendations for further ERP research will be explored.

6.2 Overall summaries

This research identified the internal barriers in Chinese ERP market share. Based on the observation from previous research review and electronic documents from focused company, structure the theoretical framework about ERP theories, through the insight of ERP system history, concepts and purpose in enterprise, clear about important issues in three aspects, which are include organizational, technical and culture issues, in order to find the barriers and potential risks in ERP implementation.

Then following focused company, using qualitative method to conduct the semi-structure interview, investigate the internal barriers in case study. Meanwhile, explore the relationships between different barriers and potential risks that could happen.

The most significant finding in this research is explored the key factors influence the ERP system in China. As mentioned about internal barriers from
different phases in ERP project, the most important barriers in the ERP project is from organizational issues. For the unreasonable ERP planning in project preparation, the unrealistic standards to evaluate the functional system in ERP implementation that could lead to the potential risks in ERP implementation, meanwhile, lacks of top management support in scheduling, such as budget, human resource and techniques, these factors conceal the risks in functional system integration. Therefore, caused by the unreasonable scheduling from top management, the interdepartmental conflicts make the functional system integration face the difficulties.

On the other hand, the essential finding of this research more specific on the technical issues in ERP implementation, although organizational structure, business strategies could influence the ERP implementation, the root of problems is from participant lacks of understanding in ERP system adoption. Therefore, technical support from in-house experts is important issue in ERP system integration, such as training staff, solving technical problems. However, many companies ignore the importance of education from ERP theory to practical operation, following serious problem could lead to less user involvement. This barrier also could expand to post-implementation phase in ERP systems maintain.

Moreover, culture barriers could be less mentioned by companies, such as corporate culture, BPR and language, these objective factors should consider from top management in ERP planning. Although changing organizational culture is difficulties, the successful ERP project also cannot ignore this aspect. In addition, following the language barriers in China, how to learn the experiences from successful Western countries are the important issues to reduce culture barriers.
Finally, the risks could be caused by different barriers, therefore, using comprehensive and reasonable perspectives inspect the risks from internal barriers is important approach to understand the key factors that could influence the ERP project.

6.3 Research Limitation

Although the focused company has the representative status in Chinese ERP market, and SAP software leading the ERP market share in China, the research scope also is limited. Only using single company cannot scan the numerous factors that influence ERP project. Therefore, caused by schedule and distance reasons, it could restrict deeper perspectives for researcher’s investigation, in order to obtain more detailed and comprehensive viewpoints from different interviewees in ERP system implementation.

On the other hand, based on the investigation is focus Chinese company, the translation problems could restrict the expression of interview contents, it could exist same translate barriers between Chinese and English. In addition, the understanding of professional concepts in professional company is another issue that make research face the difficulties, such as some professional concepts in manufacture industry. Therefore, it is suggested that researcher should enrich the knowledge structure in further studying in ERP scopes.
6.4 Recommendation

During the long period of ERP project, the root of reduce or remove ERP system barriers is for improving actor’s understanding of ERP concepts, which are include software package vendor and users. How to improve the user’s understanding and experiences in ERP adoption become the essential issue to reduce the risk of ERP implementation. It is suggested that top management support leading the whole project education, through the practical investigation in internal organization, formulating the reasonable ERP planning that could encourage the staffs involve in ERP project, using standardized system operation for business goals.

6.5 Further Research

According to the description in research limitation section, the further investigation could focus on more companies about different ERP software packages implementation in China, exploring more detailed and comprehensive ERP barriers through organizational, technical and culture issues. However, based on the initial understanding in ERP, the further research will emphasize the consequence from ERP barriers. It is expected the effective solutions to support ERP implementation in business processes.
Reference


SAP(2010) SAP Customer Success Story Consumer Products


http://www.sanygroup.com/group/zh-cn/media/224_for_news_text.htm (Accessed in 1th May 2012)


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Appendix I: Ethics Application Form

**University Research Ethics Application Form**
for Undergraduate & Postgraduate-Taught Students

I confirm that I have read the current version of the University of Sheffield ‘Ethics Policy Governing Research Involving Human Participants, Personal Data and Human Tissue’, as shown on the University’s research ethics website at: [www.sheffield.ac.uk/ris/other/gov-ethics/ethicspolicy](http://www.sheffield.ac.uk/ris/other/gov-ethics/ethicspolicy)

A1. **Title of research project:** The influence of ERP system in enterprises’ implementation – Case study of SAP Software package adopted in Sany Group

A2. **Name of Student:** Lin Tang

   Department: Information School   Email: ltang4@sheffield.ac.uk
   Tel: 07985550594

   **Name of Supervisor:** Angela Lin

A3. **Proposed Project Duration:**
   Start date: 20/02/2012   End date: 03/09/2012

A4. Mark ‘X’ in one or more of the following boxes if your research:

- [ ] involves adults with mental incapacity or mental illness
involves prisoners or others in custodial care (e.g. young offenders)

involves children or young people aged under 18 years

involves using samples of human biological material collected before for another purpose

involves taking new samples of human biological material (e.g. blood, tissue) *

involves testing a medicinal product *

involves taking new samples of human biological material (e.g. blood, tissue) *

involves additional radiation above that required for clinical care *

involves investigating a medical device *

* If you have marked boxes marked * then you also need to obtain confirmation that appropriate University insurance is in place. To do this email insurance@shef.ac.uk and request a copy of the 'Clinical Trial Insurance Application Form'.

It is recommended that you familiarise yourself with the University’s Ethics Policy Governing Research Involving Human Participants, Personal Data and Human Tissue before completing the following questions. Please note that if you provide sufficient information about the research (what you intend to do, how it will be carried out and how you intend to minimise any risks), this will help the ethics reviewers to make an informed judgement quickly without having to ask for further details.

A5. Briefly summarise:

i. The project’s aims and objectives:
   (this must be in language comprehensible to a lay person)

Research aims
This research project aims to investigate the factors influence of ERP project implementation in organizations. To gain a deeper understanding this study will carry out a case study in Sany Group to explore the factors that increase the risks of ERP implementation.

**Research objectives**

To review the knowledge of ERP implementation in enterprise

To identify enterprises' reasons for ERP adoption.

To identify the internal barriers of ERP adoption in organizations

To investigate the consequences that could affect ERP implementation

To conduct the ontology based on literature review and case study about internal barriers of ERP adoption in enterprise.

**ii. The project’s methodology:**

(this must be in language comprehensible to a lay person)

A case method is used for this study. Data source is from semi-structured interviews. The interviewees will consist of people from the top management, Finance Department IT Department, and Production Department in Sany Group, China. The interview questions will be relevant to the Group’s adoption ERP system for example the purpose of adoption, problems faced with adoption, effects of problems on Sany Group. The interviews will be conducted via the Internet for example using Skype. It is depend on which one could to collect data more efficiently.
A6. What is the potential for physical and/or psychological harm / distress to participants?
There will be no potential for physical and/or psychological harm / distress to participants.

A7. Does your research raise any issues of personal safety for you or other researchers involved in the project? (especially if taking place outside working hours or off University premises)
No, it is not related to personal safety for researcher because the interviews will be conducted over the Internet.
If yes, explain how these issues will be managed.

A8. How will the potential participants in the project be:

i. Identified?
The potential participants are user’s business departments in Sany Group and ERP project staff. Company staffs include production department staffs, financial department staffs and top management staffs. ERP project staffs include project manager, consultants and technical guidance.

ii. Approached?
First of all, the researcher should obtain the permission from the company to gain access to the staff. Then the potential interviewees will be identified and contacted in person via email. The project research aim, objectives and benefits to participants will be explained to the company and participants in order to gain access.

iii. Recruited?
The participation in the project is entirely voluntary. The potential participated will be contacted and it is up to them to decide whether they would like to take part of the research. They can withdraw at any stage of the data collection if they do not want to continue.

A9. Will informed consent be obtained from the participants?
If informed consent or consent is **NOT** to be obtained please explain why.
Further guidance is at:
www.sheffield.ac.uk/ris/other/gov-ethics/ethicspolicy/policy-notes/consent

A9.1. This question is only applicable if you are planning to obtain informed consent:

How do you plan to obtain informed consent? (i.e. the proposed process?):

When an individual is approached to be interviewed, I will explain the project details to the potential interviewees in the invitation email, who am I, what the project is about, why I should do it, what risks it poses to them, who will benefit, and what will become of the materials, This makes for “informed consent,” meaning they truly understand what they are getting involved in. If they understand and are willing to accept the invitation they reply to my email.

A10. What measures will be put in place to ensure confidentiality of personal data, where appropriate?

The interview contents should be agreed by participants, then using the Internet to conduct semi-interviews. The questions about personal information (e.g. salary, gender, age) and sensitive commercial issues will not be covered during the interviews. All interview transcripts will be anonymized so no names will be shown in the document. The transcripts will be sent to the interviewees for them to confirm and clarify the contents. If they consider that any contents could harm their interests or company policies, then the data of concern will not be used in the dissertation.

A11. Will financial / in kind payments (other than reasonable expenses and compensation for time) be offered to participants? (Indicate how much and on what basis this has been decided)

No payments will be offered to participants.
A12. Will the research involve the production of recorded media such as audio and/or video recordings?

YES ☐ NO ☒

A12.1. This question is only applicable if you are planning to produce recorded media: How will you ensure that there is a clear agreement with participants as to how these recorded media may be stored, used and (if appropriate) destroyed?

Guidance on a range of ethical issues, including safety and well-being, consent and anonymity, confidentiality and data protection’ are available at: www.sheffield.ac.uk/ris/other/gov-ethics/ethicspolicy/policy-notes

For Undergraduate & Postgraduate-Taught Students

Student Declaration

(The student completes Annex 1 if the Supervisor has classed the student’s proposed research project as ‘low risk’)

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The Supervisor needs to receive an electronic copy of the form, and other documents where appropriate, plus a signed, dated paper copy of this Annex 1 ‘the Student Declaration’.

Full Research Project Title: The influence of ERP system in enterprises’ implementation – Case study of SAP Software package adopted in Sany Group

In signing this Student Declaration I am confirming that:

- The research ethics application form for the above-named project is accurate to the best of my knowledge and belief.
- The above-named project will abide by the University’s ‘Good Research Practice Standards’: www.sheffield.ac.uk/ris/other/gov-ethics/good
- The above-named project will abide by the University’s ‘Ethics Policy Governing Research Involving Human Participants, Personal Data and Human Tissue’: www.sheffield.ac.uk/ris/other/gov-ethics/ethicspolicy
- Subject to the above-named project being ethically approved I undertake to adhere to any ethics conditions that may be set.
- I will inform my Supervisor of significant changes to the above-named project that have ethical consequences.
- I will inform my Supervisor if prospective participants make a complaint about the above-named project.
- I understand that personal data about me as a researcher on the research ethics application form will be held by those involved in the ethics review process (e.g. my Supervisor and the Ethics Administrator) and that this will be managed according to Data Protection Act principles.
- I understand that this project cannot be submitted for ethics approval in more than one department, and that if I wish to appeal against the decision made, this must be done through the original department.

Name of Supervisor: Angela Lin

Name of student: Lin Tang

Signature of student: Lin Tang
Date: 25/06/2012
For Undergraduate & Postgraduate-Taught Students

Supervisor Declaration

(The Supervisor completes Annex 2 if s/he has classed the student’s proposed research project as potentially ‘high risk’)

The Ethics Administrator needs to receive an electronic copy of the form, and other documents where appropriate, plus a signed, dated paper copy of this Annex 2 ‘the Supervisor Declaration’.

Full Research Project Title: The influence of ERP system in enterprises’ implementation – Case study of SAP Software package adopted in Sany Group

In signing this Supervisor Declaration I am confirming that:

- The research ethics application form for the above-named project is accurate to the best of my knowledge and belief.

- The above-named project will abide by the University’s ‘Good Research Practice Standards’: http://www.shef.ac.uk/ris/gov_ethics_grp/grpstandards.html

- The above-named project will abide by the University’s ‘Ethics Policy for Research Involving Human Participants, Data and Tissue’: http://www.shef.ac.uk/ris/gov_ethics_grp/researchethics/index.html

- Subject to the above-named project being ethically approved I will undertake to ensure that the student adheres to any ethics conditions that may be set.
• The student or the Supervisor will undertake to inform the Ethics Administrator of significant changes to the above-named project that have ethical consequences.

• The student or the Supervisor will undertake to inform the Ethics Administrator if prospective participants make a complaint about the above-named project.

• I understand that personal data about the student and/or myself on the research ethics application form will be held by those involved in the ethics review process (e.g. the Ethics Administrator and/or reviewers) and that this will be managed according to Data Protection Act principles.

• I understand that this project cannot be submitted for ethics approval in more than one department and that if I and/or the student wish to appeal against the decision made, this must be done through the original department.

Name of Supervisor: ____________________________

Name of student: ________________________________

______________________________
Signature of Supervisor:

________________________
Date:
Appendix II: Information Sheet

Information sheet

Research Project Title:
The influence of ERP system in enterprises’ implementation – Case study of SAP Software package adopted in Sany Group

1. Invitation paragraph
You are being invited to take part in a research project. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

2. What is the project’s purpose?
This research project aims to investigate the factors influence of ERP project implementation in organizations. To gain a deeper understanding this study will carry out a case study in Sany Group to explore the factors that increase the risks of ERP implementation.

3. Why have I been chosen?
You are being asked to be in this research because you are a staff in company or a staff in ERP project implementation in Sany Group. Your opinions and advice on the Sany Group in China is the main focus of the study. The estimated number of study participants is about 12 to 15.

4. Do I have to take part?
It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep (and be asked to sign a consent form) and you can still withdraw at any time without it affecting any benefits that you are entitled to in any way. You do not have to give a reason.

5. What will happen to me if I take part and what do I have to do?
You will be interviewed by the researcher of this study. The duration of the interview is about 20 minutes. During the interview, you will be asked open questions about ERP project implementation in Sany Group. The interview will be conducted social media such as Skype or telephone that you agreed with. According to participate’s leisure time, it could also be arranged with the researcher

6. What are the possible disadvantages and risks of talking part?
We do not anticipate that there will be any disadvantage in taking part in this research, other than the time you give up by participating in the project.

7. What are the possible benefits of taking part?
As a participant in this research study, there may be no direct benefit for you; however, it is hoped that this work will not only offer company staffs an insight into international company needs of
information regarding the company interests, but also improve the ERP project staff’s experiences in the future by proposing some initiatives for promoting ERP project services.

8. What happens if the research study stops earlier than expected?
If the research stops earlier than expected, then you will be informed promptly and no further input will be required.

9. What if something goes wrong?
If you are unhappy about any aspect of the project, then please contact us, using the details at the end of the sheet. If you do not wish to contact the researchers themselves, then please contact our supervisor, who is also identified at the end of the sheet. If you feel that your complaint has not been handled to your satisfaction by the researcher or supervisor, you can contact the University’s Registrar and Secretary (details are on the university website, http://www.shef.ac.uk/).

10. Will my taking part in this project be kept confidential?
All the information that we collect about you during the course of the research will be kept strictly confidential. You will not be identified in any report or publication, unless you have specifically required that you should be identified. The data we collect will be kept secure.

11. What will happen to the results of the research project?
The data will be used for a Masters dissertation at the University of Sheffield iSchool. This dissertation may be published electronically on the iSchool’s website, and the findings of the dissertation may be used in published articles.

12. Who is organising and funding the research?
The research is organised by the Information School, University of Sheffield. Any incidental expenses are being covered by the researchers and/or the Information School.

13. Who has ethically reviewed the project?
This project has been ethically approved via the Information School’s ethics review procedure. The University of Sheffield’s Research Ethics Committee monitors the application and delivery of the University’s Ethics Review Procedure across the University.

14. Contact for further information
Researcher: Lin Tang
Email address: Ltang4@sheffield.ac.uk
Telephone number: 07985550594
Supervisor: Angela Lin
Angela Lin, Information School, University of Sheffield, a.lin@sheffield.ac.uk

You will be given a copy of this information sheet to keep.
Thank you for taking part in this project!
Appendix III: Main interview questions

Top management Staff

Could you please talk about background and previous experiences in ERP project? What are the purposes for adapting ERP software package in company? Could you please talk about your personal opinion about ERP project implementation in company? What are the influences of previous ERP system implementation? What are the problems in previous ERP system implementation?

In-house ERP consultant

How long did you work in ERP domain? What is your main responsibility in the ERP project? Could you please talk about your personal opinion in ERP implementation? Could you please talk about problems in different ERP implementation phases? What are the key factors influence the ERP project in company? What are the consequences due to ERP system barriers? How do you think about culture differences in ERP project?

IT expert

How long did you work in the company? What is your responsibility in the company? Could you please talk about IT problems in company? What are the ERP system threatens problems that caused by IT problems? How did you solve the IT problems?

SAP module consultants

How long did you work in ERP domain? What is your main responsibility in the ERP project? How long did you work in ERP domain? What is your responsibility in the project? Could you please talk about the problems from different modules?
Project manager

How long did you work in ERP domain?
Could you please talk about your personal about ERP project?
Are there any difficulties in ERP implementation? Could you please talk about the details?
How do you think about culture differences in ERP project?

Departmental director

What is your main responsibility in the company?
How do you think about the influence of ERP system in business processes?
Could you please talk about departmental communication and cooperation problems in different system integration?
Are there any difficulties in functional system integration? Could you please talk about the details?
How do you think about culture differences in ERP project?