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Winter 12-19-2001

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THE ERP IMPLEMENTATION IN CHINA

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ABSTRACT

We investigate the current status of enterprise resource planning (ERP) implementation in China by means of executive survey and statistical analysis. Pilot studies were conducted to help facilitate the design of the survey questionnaire; follow-up phone interviews were made to ensure the usable return of the research. We sent out survey questionnaires in July 2001 to senior executives of 150 companies and received 86 returns, with 82 usable ones. Statistic analyses were conducted using SAS to determine the trend of ERP implementation in China, its key success factors, and managerial implications of ERP in China.

1. INTRODUCTION

We investigate enterprise resource planning (ERP) implementation in China in a broad sense, which includes integrated e-procurement and enterprise management (ERP), supply chain management (SCM), customer relationship management (CRM), and other strategic business applications. According to AMR Research Inc., the aforementioned enterprise commerce management (ECM) applications will have a combined market of \$102 billion by 2005, as companies re-evaluate their return on investment and cost-effectiveness (AMR Research Inc. 2001).

Despite high expectations on ERP systems, past research provides little confidence that the transformational power of information technologies (IT's) materializes as intended. Many questions regarding ERP implementation remain unanswered: For example, why implement ERP if the existing but fragmented decision support systems (DSS's) or the existing legacy systems may do? Where or which module of ERP can or cannot be used? And how to ensure a successful ERP implementation would improve SCM? Indeed, research results covering a variety of technologies implemented in many different kinds of industries have revealed that changes induced by information technology are often resisted, and that modification of intended changes is common.

ERP implementation in China is relatively new compared with that in US, nevertheless there are some well-publicized successful implementation cases, such as Haier Electronics. Some of the most commonly cited obstacles of ERP implementation in China are high cost, complexity of implementation, culture and language differences, and lack of infrastructure. Others believe that lack of conceptual understanding of what ERP can or cannot do among top executive hinders the growth rate of ERP implementation in China.

In this research, we investigate the ERP implementation in China, by means of pilot studies, executive interviews, mail

survey questionnaire, and statistical analysis. The results of this research will provide valuable insights of ERP implementation in China as opposed to that in US. Specifically, we try to explore the trend of ERP implementation, success factors, integration with other information technologies, and its impact on global competitiveness. Pilot studies were conducted on selective Chinese enterprises with operations in Beijing, whereas executive interviews were held mainly with the students in the Executive Class of Beijing International MBA at Peking University. The mail survey questionnaire was followed by telephone follow-ups and second round survey questionnaire.

Statistic analyses would be focused on both descriptive statistics and hypothesis tests. The descriptive statistics would provide valuable insights of ERP implementation in China, whereas the hypothesis tests would help identify unique ERP implementation features relevant to societal, economical, and cultural aspects in China.

Managerial implications would be analyzed by linking ERP integrated supply chain networks with business process reengineering (BPR), because complex, cumbersome, unnecessary, or non-value-added activities are what account for organizational obesity and burdensome costs.

BPR, together with ERP integrated SCM, has been credited with the following:

- Reducing inventory
- Eliminating paperwork
- Eliminating redundant function
- Reducing manufacturing or service cycle times
- Lowering warehousing and shipping costs
- Bypassing unnecessary steps such as incoming inspection
- Eliminating extraneous communication and expediting
- Speeding payments across the arcs of the supply chain
- Reducing errors

2. LITERATURE REVIEW

The advance of modern information and communication technologies, such as ERP, makes it possible to develop and implement a variety of flexible supply chain options that can create significant cost and value advantages, due to the emergence of new information technologies and awareness of new organizational forms such as virtual organizations (Jacobs and Whybark, 2000).

Shapiro (1999, p. 739) believes that ERP systems offer the promise of homogeneous, 'transactional databases' that will enhance the integration of supply chain activities. As a result, ERP standardizes the company's data and manages it on a

real-time basis so that it could perform the required SCM functions from data entry to accounting to purchasing, and so on.

Although ERP has been implemented in many manufacturing organizations, there have been mixed reports concerning a universally successful outcome. Many factors contribute to the success of ERP implementation: for instance, top management initiative, commitment, and support; implementation strategy; education and training; selection of software vendors; and change management (Bingi, Sharma, and Godla, 1999).

In a recent Deloitte Consulting (1999) report on ERP evolutions in manufacturing, it was concluded that ERP is not an all-winner tool. *"For some companies, it helps to create a reenergized organization with customers, shareholders, and employees more empowered than ever to drive new business value. For others, however, the results can be an organization fatigued from the long implementation experience, people frustrated by a perceived lack of business benefits and uncertain of their company's direction."*

BPR was first introduced by Hammer (1990) in a Harvard Business Review paper with the eye-catching title, "Reengineer work: Don't Automate, Obliterate." BPR involves a fundamental rethinking and redesign of business processes to achieve improvement in critical measures of performance, such as cost, quality, customer service, and speed to market. BPR relies on a different school of thought than continuous process improvement. In the extreme, reengineering assumes that the current process is irrelevant, that it doesn't work, that it's broke, and to forget it and start over. Such a clean-slate perspective enables the system designers to disassociate themselves from the current process. It is like projecting oneself into the future and asking the questions: what should the process look like? What do the stakeholders want it to look like? How do best-in-class organizations do it? What might we be able to achieve with new technology? Mainly, BPR implementation requires a commitment for change not only by top management (a must), but also by everyone else in the firm.

BPR goes hand in hand with ERP (Ng, Ip, and Lee, 1999). Ng et al. assert that the use of IT is essential to the success of BPR and that BPR should precede ERP and must be integrated with it. Nothing but a state-of-the-art IT can make BPR possible. They define BPR as the rapid and radical redesign of the organization to achieve all the good things that we want, from ERP to JIT to SCM.

In a recent study on IBM, we find that IBM has entered into partnerships with many ERP vendors, including SAP, Baan, Oracle, and Peoplesoft, which account for 70% of the 7 billion dollar ERP market. IBM believes that in order to make an ERP implementation successful, it is necessary to encompass ERP with SCM and CRM and to expand ERP externally with web-enabling features.

3. METHODOLOGY

The survey questionnaire consists of four (4) parts: 1. Company and respondent information, 2. Basic concept of ERP as opposed to SCM, 3. Expected benefits of ERP implementation, and 4. Major obstacles of ERP implementation in China. All the survey questions, initially designed in English, were available both in English and in Chinese. Pilot studies were conducted in three companies: one in the computer industry, another in the electronic appliances industry, and still another in the electronic tools industry. Feedbacks of the pilot study were used to refine the survey questionnaires in order to receive desirable survey results.

Part 1 of the questionnaire has 5 questions: Annual, Number of Employees, Types of Ownership, Industry Group, and Respondent Position. Each question can be answered in five (5) categories. In addition to company information in Part 1, where are a total of 54 questions in the questionnaire in parts 2 through 4, which are rated in 1 to 7 Likert scale: 1 – strongly disagree, 2 – disagree, 3 – somewhat disagree, 4 – not sure, 5 – somewhat agree, 6 – agree, and 7 – strongly agree.

Survey questionnaires were sent out to executives of 150 companies in July 2001, with follow-up phone interviews. As of July 31, 2001, we have received 86 returns, of which 82 are usable ones or a 54.7% usable return rate.

4. ANALYSIS

Preliminary analysis indicates that China has begun its journey toward ERP implementation. However, due to such factors as high ERP implementation cost, language barrier, lack of IT infrastructure, and ownership of many state owned enterprises, ERP implementation has its unique characteristics in China.

The following is a list of tables describing company information of the 82 respondents:

Annual Sales	Frequency
< \$1 million	05
\$1 - 10 million	29
\$10 - 100 million	26
\$100 million - \$1 billion	12
> \$1 billion	10
Total	82

No. of Employees	Frequency
< 25	08
25 - 100	17
100 - 500	29
500 - 1000	08
> 1000	20
Total	82

Type of Ownership	Frequency
Joint Venture	17
State Owned Enterprise	26
Foreign Funded	15

Nonprofit Organization	01
Other	23
Total	82

Industry Group	Frequency
Manufacturing	28
Wholesaler & Retailer	03
Telecom & Utilities	17
Finance & Insurance	13
Professional Service	21
Total	82

Position	Frequency
CEO/CIO/CFO	36
Senior V. P.	23
Director	09
Senior Manager	08
Other	06
Total	82

The 54 questions in the survey questionnaire are listed below:

I. Basic Concept of ERP Implementation

1. SCM is an important component of business operations
2. ERP would enhance the efficiency of SCM
3. SCM would reduce costs and increase quality and speed
4. IT would enhance the effectiveness of overall performance
5. ERP is more of a concept than software
6. BPR is one of the key success factors in implementing ERP
7. ERP and SCM implementation support business strategies
8. Executive support is the key success factors for ERP implementation
9. CRM is an important concept in the service industry
10. MRPII should be implemented before ERP
11. E-business is a prerequisite to ERP or CRM implementation

II. Expected Benefits of ERP or CRM Implementation

12. ERP would improve internal communication and coordination
13. ERP would strengthen strategic planning
14. ERP would enable firms to adopt innovative organizational structures
15. ERP would improve management decision making
16. ERP would streamline business processes
17. ERP would help firms gain leverage over its suppliers
18. ERP would help reduce variance in suppliers' lead times
19. ERP would help develop close relationship with suppliers
20. ERP would improve the quality of products/services from suppliers
21. ERP would enable electronic transactions with suppliers
22. ERP would improve production throughput or service volume
23. ERP would enhance operations flexibility

24. ERP would improve the labor productivity
25. ERP would enhance utilization of equipment
26. ERP would reduce cost of tailoring products or services
27. CRM would enhance the business value through customer satisfaction
28. CRM would decrease the cost of new products/services development
29. CRM would reduce the development time for new products/services
30. CRM would enhance the quality of products/services
31. CRM would support product/service innovation
32. CRM would enable the identification of market trends
33. CRM would increase the ability to anticipate customer needs
34. CRM would enable sales people to target right market segments
35. CRM would improve the accuracy of sales forecasts
36. CRM would help track market response to pricing strategies
37. CRM would enhance the ability of post sales service and support
38. CRM would enhance the flexibility and responsiveness to customers
39. CRM would improve the distribution of goods and services
40. CRM would enhance the ability to attract and retain customers
41. CRM would help enhance customer loyalty

III. Major Obstacles of ERP Implementation in China

42. ERP is too expensive for most Chinese enterprise
43. ERP is too complicated for most Chinese enterprises
44. The prerequisite for ERP is TI infrastructure in China
45. The main obstacle of ERP in China is lack of well trained employees
46. The main obstacle of ERP in China is lack of incentives for SOE
47. The main obstacle of ERP in China is language barrier
48. The main obstacle of ERP in China is different business culture
49. ERP is not applicable when speed of information is not critical
50. ERP is not applicable when transaction cost is not critical
51. ERP is not applicable when data integration is not critical
52. ERP is not applicable to small or medium size enterprises
53. CRM is not applicable to service industries in China
54. CRM is another way of saying ERP in the service industry

5. SUMMARY

REFERENCES

[References will be provided on request to the author]