A COMPARISON OF CRITICAL SUCCESS FACTORS OF ENTERPRISE RESOURCES PLANNING IMPLEMENTATION BETWEEN CHINA AND FRANCE

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ABSTRACT

There is an increasing need to implement a total business solution which supports major business functionalities of an enterprise. Enterprise Resource Planning (ERP) software is designed to meet this need, and has been adopted by different organizations worldwide. Implementing an ERP system was thought complex, expensive, and time consuming. Many organizations do not achieve success in their ERP implementation projects. This article seeks possible reasons for major international ERP vendors not being able to dominate the Chinese ERP market. The aim of this research is to explore the differences in Critical Success Factors (CSFs) for ERP system implementation in China and France and discuss the development of ERP market between two countries in the last years.

Keywords: *Enterprise Resources Planning, China, Implementation, Critical Success Factors, France.*

1. INTRODUCTION

The rapid development of technology in 21st century drives the competitive advantage of enterprises transfer from the tangible resources to the intangible assets such as information technology. As an example of the application of information technology (IT) in the field of business management, ERP system has been invented and widely adopted by firms. ERP integrates business information flow, logistics and cash flow in order to optimize firm's internal processes and business procedures. Moreover, it can enhance enterprise's excavating capability, accelerate the pace of marketing, and facilitate business processes to create great value. Beyond the high costs and significant amount of effort needed to implement such a system, the possible benefits for the organization in achieving more efficient operations and improving its competitive stance in the competitive business environment have been undoubted. The high failure rates of ERP systems implementations (Soh et al., 2000; Willis and Willis- Brown; 2002) have paved the way for a chase from both academicians and practitioners to understand and pinpoint the critical success factors that positively impact this type of projects' success.

ERP software market is thought to be one of the fastest growing markets in the software industry. According to AMR Research, the ERP market will be expected to grow to $64.8 billion by 2009 (AMR Research, 2005). The major ERP vendors are SAP AG and Oracle. A research has been done on factors that affect the implementation process to identify the

critical success factors that are necessary for successful ERP implementation in Chinese and French companies.

2. ERP IMPLEMENTATION IN FRANCE

French ERP market valued 34.1 billion in 2008, ranked 3rd place in EU (European Union), ahead of Italy and Netherlands. Over the period 2006-2008 reached a peak of 5.8% growth rate slightly higher than EU average that registered 5.5%. As a consequence of economic crisis on 2008 the growth rate slowed, however forecasts indicate a growth of 1.5% year (CBI survey, 2009). The ERP market is composed either by software applications and technological services. Both sectors in the period 2006-2008 surpassed EU average growth. Software market registered an average annual growth of 5.6% and IT recorded an annual growth of 5.9%, however is expected a standstill in the next years as a consequence of difficult economic situation in several French end user markets. French ERP market represents a significant slice of the economy, it employees around 335,000 people and has 33,000 companies operating on. 60% of the market is dominated by large companies, those who bill more than 500 million Euros a year. Slowed of the economy since September of 2008 spread particularly on the software applications, where interest of large and multinational corporate clients in this kind of software reduced. Demand drop on IT services was not so fierce, is expected to grow 2%, but at a slower pace than before the crisis. Besides external impact of the unpleasant economic environment, market tendency is changing. Companies tend to focus on IT projects with short return on investment since French citizens are not long term oriented, as Hofstede study concluded (Hofstede, 1993). Also new areas of interest namely Business Intelligence and CRM (Customer Relationship Management) solutions are becoming even more attractive to start investing on. Moreover a new model of providing software is also arising. Saas could make up 25-30% of the overall ERP market by 2011(John Franke, 2007) given the growing number of projects involve financing subscription of Saas, therefore it would be recommend to Quidgest start rethinking its strategy by enhancing its ERP on-line platform in order to be competitive in this field.

The main players of software are Microsoft, IBM, Oracle and SAP with 16%, 6%, 5% and 4% market share(CBI survey, 2009) respectively. In the IT services industry landscape is not the same. IT services enterprises origin from France still control 68% of the market.
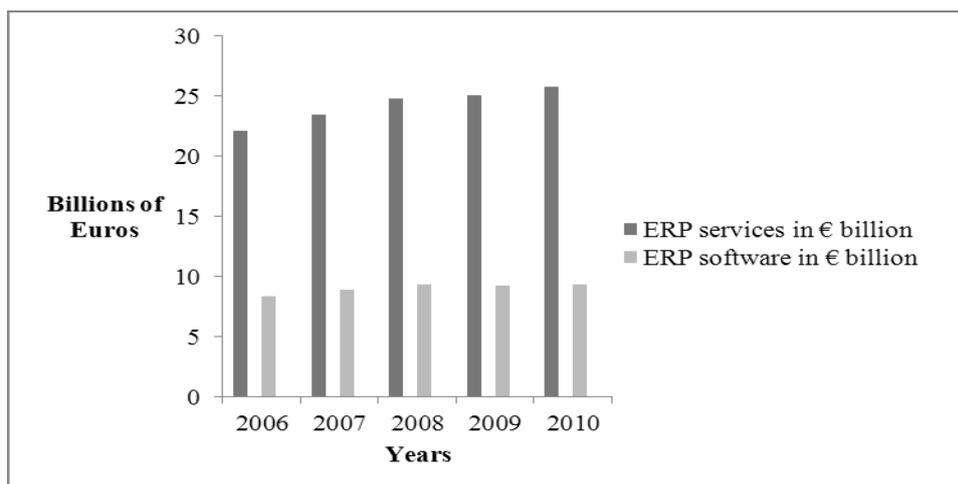

Figure 1: France ERP market 2006-2010 (CBI survey, 2009)

3. ERP IMPLEMENTATION IN CHINA

ERP implementation first occurred in China in the 1980's and companies like SAP AG have been in the market for over 10 years (Hartung, 2008). The Chinese ERP market has boomed

in recent years as more business managers applied ERP systems in their organizations. According to China Center for Information Industry Development Consulting, the Chinese ERP market nearly doubled its growth from approximately USD 70 million in 2000 to USD 106 million in 2001. IDC, a premier global market intelligence and advisory firm in the information technology industries, reported that the Chinese ERP market grew from USD 78.4 million in 1997 to USD 243 million in 2002. From 2002 to 2005, the Chinese ERP market was increased with an annual growth rate of 25%. According to China Center for Information Industry Development, ERP sales in Mainland China reached US $226.9 million in 2003, and reached US $652.8 million in 2008, at an estimated growth rate of 23.5% over the next 5 years. Attracted by tremendous business opportunities in the Chinese ERP market, SAP, Oracle, and other foreign ERP vendors have entered China one after another. SAP entered the Chinese ERP market in 1988 and Oracle followed in the middle of the 1990s. Given their past success history, these ERP giants anticipated taking control of the Chinese ERP market. In reality, it has not been so easy for the global ERP vendors to tame the Chinese ERP market. In the 2009 report of Chinese ERP market from Gartner, domestic ERP vendors take a major share of the market. Table 1 show that the top seven players hold 86% of the ERP market, with three Chinese domestic companies holding 62% and the four foreign ERP leaders holding a 24% market share.

Evidently, in the competition to sell ERP systems, the foreign giants have not demonstrated their usual dominance. Instead, Chinese domestic ERP companies have held their ground against the foreign giants. Obviously, the Chinese ERP firms have emerged as dominant players in this important market.

The ERP market in China in 2010 is about $586 million. It is the largest segment of the enterprise applications market, commanding 31% market share in 2010. By 2014, the market should reach $1.06 billion (Gartner, 2009). UFIDA commands the most market share at 32%, while local rivals Inspur and Kingdee control 16%, and 15% respectively.

Table 1. Chinese ERP market share by company, 2009

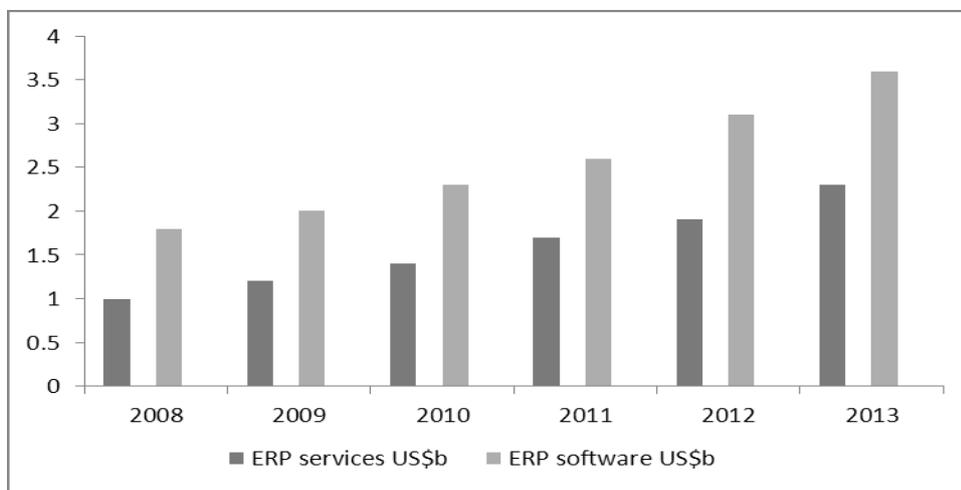| Ranking(by supplier)	Company name	Market share (%)
1	UFIDA	31
2	Inspur	16
3	Kingdee	15
4	SAP	15
5	Oracle	5
6	Microsoft	2
7	QAD	2
	Others	14

Source: Gartner, 2010.

Figure 2: China ERP market 2008-2013 (IDC, 2010)

4. MOTIVATIONS

Through a set of market review, motivations for Chinese companies to apply an ERP system are illustrated as follows.

The organization suffer from poor visibility of data and poor integration in their old systems, they have not strong organizational resistance. For that the companies drive to implement a single, new and integrated enterprise software system such as ERP able to support the development.

The companies expect their enterprise software systems to deliver real business value, improve business performance and standardize business operations and the company's management performance.

Transformation of the organization system leads to the re-share of the business market. Government protection policy is no longer a competitive advantage for the companies. Companies need to find new methods, such as applying ERP systems, to move on with the business.

According to a source from Genersoft [WEB02], the motivation for Chinese companies to implement an ERP system is indicated in the following pie chart by Figure 3.
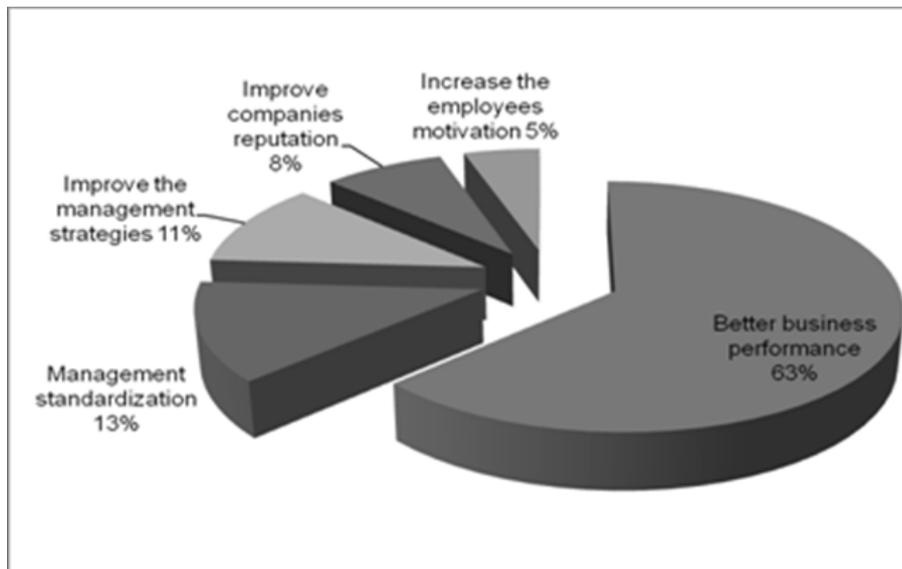

Figure 3. Motivations to implement ERP systems (Genersoft [WEB02])

5. RESEARCH OBJECTIVES AND METHODOLOGY

The objective of the paper is to use the data of Chinese companies to evaluate the importance of the critical success factors in ERP implementation in Chinese business society. A field study was conducted with 115 respondents within five companies in Shanghai City. Data were collected through an experience survey using a questionnaire designed with items for each one of these 7 selected factors. For each factor, a question assesses the level of importance that it has in the implementation process. This level, or grade, was provided based on the experience of the enterprise.

This study also used a CBI surveys combining with Internet to examine the factors and research framework and the questionnaire is adapted from prior literature. Data were collected from those firms that have implemented ERP systems within recent two years in France.

A five-point Likert scale was used in order to determine the importance level of each critical factor. The scale goes from "Extremely critical and important for the success of the implementation" to "Neither critical nor important for the success of the implementation."

6. CSFS IN ERP IMPLEMENTATION IN CHINA

A critical success factor is something that the organization must do well to succeed. In terms of information system projects, a critical success factor is what a system must do to accomplish what it was designed to do.
In this paper, the critical success factors have been arranged in an organized and adequate set in order to have a better understanding and a clearer picture of the factors that are considered to be vital for successful ERP implementation in China and France.

6.1 Teamwork and composition

The ERP team should involve of the best people in the organization (Loh and Koh, 2004). The success of projects is related to the knowledge, skills, abilities, and experiences of the project manager as well as the selection of the right team members (Al-Mashari et al., 2006). Also, team should not only be technologically competent but also understand the company and its business requirements (Remus, 2006).

An ERP project involves all of the functional departments in an enterprise. It demands the effort and cooperation of technical and business experts as well as end-users (Loh and Koh, 2004). Both business experts and technical knowledge are important for success (Nah, 2003). The sharing of information between the implementation partners is essential and requires partnership trust (Loh and Koh, 2004). Moreover, the team should be familiar with the business functions and products so that they know what needs to be improved to the current system (Rosario, 2000).

6.2 Top Management support

Top management support has been identified as the most important success factor in ERP system implementation projects. According to Zhang et al. (2002), top management support in ERP implementation has two main aspects: providing leadership and providing the necessary resources. Reimers (2002) found that, managers in traditional Chinese companies do not trust the system in terms of data quality and also in terms of appropriateness of suggested decisions. The managers prefer to make the decisions according to their intuition and experience.

6.3 Business process re-engineering

Hammer and Champy (2001) defined Business process re-engineering (BPR) as "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed". Somers and Nelson (2004) stated that BPR plays a significant role in the early stages of implementation. Aligning the business process to the software implementation is critical (Holland et al., 1999). Organizations should be willing to change their businesses to fit the software in order to reduce the degree of customizations (Murray and Coffin, 2001).

6.4 Effective project management

ERP systems implementation is a set of complex activities, involving all business functions and often requiring between one and two years of effort, thus companies should have an effective project management strategy to control the implementation process, avoiding overrun of budget and ensuring the implementation within schedule. There are five major parts of project management: (1) having a formal implementation plan, (2) a realistic time frame, (3) having periodic project status meetings, (4) having an effective project leader who is also a champion, and (5) having project team members who are stakeholders.

6.5 User involvement

User involvement refers to participation of the user in the process of ERP implementation. The functions of the ERP system rely on the user to use the system after going live, but the user is also a significant factor in the implementation. There are two areas for user involvement (Zhang et al., 2002):
(1) User involvement in defining the company's ERP system needs and;
(2) User participation the implementation of ERP systems.

User involvement increase user satisfaction and acceptance by developing realistic expectations about system capabilities (Esteves et al., 2003). User involvement is essential because it improves perceived control through participating in the whole project plan.

6.6 Education and training

User training should be emphasized, with heavy investment in training and re-skilling of developers in software design and methodology (Summer, 1999). However, education and training are frequently underestimated and are given less time due to schedule pressures, and less understanding of cross-functional business process is often reported.

Educating and training users to use ERP is important because ERP is not easy to use even with good Information Technology skills (Woo, 2007). Nah et al., (2003) argued that sufficient training can assist increase success for ERP systems. However, lack of training may lead to a failure.

6.7 Suitability of software and hardware

Due to the lack of professional expertise and experience on developing ERP systems in-house, many companies prefer to buy off-the-shelf systems to shorten the ERP implementation cycle. ERP packages provide generic off-the-shelf business and software solutions to customers. More or less they can't fully meet the company's needs, especially when the business processes of the company are unique.

6.8 Effective Communication / Interdepartmental Communication

Stakeholder expectations should be effectively communicated in order to better achieve time/quality efficient, undisturbed communication. Communication channels can be broken because of difference in languages as well as technical terminology knowledge levels. Effective communication with the end-users should be managed, especially at the requirements collection stage (Nah et al., 2001; Loh and Koh, 2004). Communication amongst the different departments and between business processes in the organization is also a significant issue to be considered and suggestions to foster it include communication plans and the continuous updates regarding the system's influence in users' work. (Akkermans and Van Helden, 2002; Somers and Nelson, 2004).

6.9 Change Management Programme and Culture

The company should be prepared for changes in the existent business culture. A specific change management programme can be devised which has a strong focus on education and training of the users on the ERP system and encompasses their involvement in the business processes design. (Nah et al., 2001; Loh and Koh, 2004; Motwani et al., 2 005).

6.10 Organizational Culture

Organizational culture was defined by Schein (1992) as "a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems".

In China's ERP market, foreign ERP vendors (mostly are European and American vendors) took up more than 90 per cent market share (Source: IDC 1998). Kumar and Bjorn-Anderson (1990) have concluded that information system design methodologies have built-in value biases reflecting the value priorities of the culture in which they are developed.

7. RESULT

The mean of CSF for each of China and France counted separately and earned result depicted in Table 2. To understand what differences exist between ERP critical success factors in these two countries, CSF score of both drew in Figure 4. As it has shown, both of the diagrams almost have a similar pattern. But there are some differences, as it shows in Figure 4 some factors seem more important for Chinese companies and in some factors seem more important for French companies.

Table 2: The importance of critical success factors (CSF) in ERP implementation in China and France-Rating from 1 (extremely low) to 5 (extremely high).

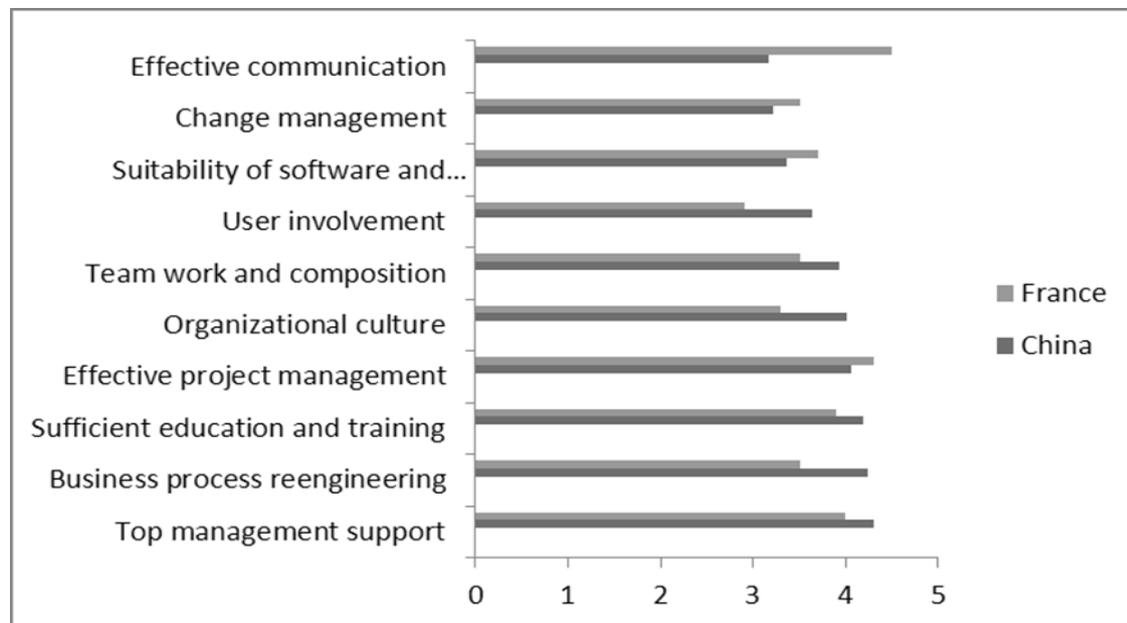| Critical success Factors	China	France
Top management support	4.30	4.3
Business process reengineering	4.24	3.5
Sufficient education and training	4.19	4
Effective project management	4.06	3.9
Organizational culture	4.01	3.3
Team work and composition	3.93	3.5
User involvement	3.64	3
Suitability of software and hardware	3.36	4.5
Change management	3.21	3.7
Effective communication	3.16	3.5

Figure 4: Comparison of Critical Success Factors between Chinese and French Companies

8. DISCUSSION

The purpose of this study was to discover is there any differences between ERP's Critical Success Factors (CSF) in China and France or not. This study showed that in during ERP implementation CSFs are not much different between two countries but still there are undeniable differences. It seems national culture of China has an impressive effect on ERP implementation in this county.

Table 2 has listed the score of the importance of CSFs both from Chinese and French companies. It is obviously to see that top management support, Business process reengineering, Sufficient education and training, Effective project management, Organizational culture were found as the most important CSFs with the highest score. It is no doubt to believe that top management support is positioned as the most important CSF in ERP system implementation in China compare to France that is ranked2nd most important factor in ERP implementation (this point is same as previous western and Chinese research results) and after Suitability of software and hardware which is ranked the most important CSFs with the highest score in addition to the Sufficient education and training, Effective project management and Change management that were also positioned as most important. To increase the chance of success, management must choose software that most closely fits its requirements and companies should conduct requirements analysis first to make sure what problems need to be solved and select the ERP systems that most fit their requirements. The hardware then is selected according to the specific ERP systems' requirements. Two aspects should be cared when selecting software and hardware:

1. Compatibility of software/hardware and company's needs;
2. Ease of customization.

User involvement was found more important in Chinese companies than it in French companies. It is understood that user involvement was often mentioned by Chinese researchers. Even for western researches, user involvement was ranked outside of the top 10 CSFs. Involving user has a positive impact on ERP implementation success. System implementation represents a threat to users' perceptions of control over their work and a period of transition during which users must cope with differences between old and new work systems. User involvement is effective because it restores or enhances perceived control through participating in the whole project plan.

Presence of change management was found more important in French companies. Many researchers have discussed this factor. Most Chinese researchers didn't list this factor as one critical success factor for Chinese companies, although some western researchers listed it as one of important CSFs.

Effective communication was found more important for French companies. It is identical with Somers and Nelson (2001) research. However, it was not listed as one of the most important CSFs for Chinese companies in this case studies. In addition, Chinese companies tended to be more emphasis on evaluation of performance than French companies.

However, Team work and composition and sufficient education and training were found more important in Chinese companies than them in French companies. These factors reflect that Chinese companies had sufficient qualified ERP personnel. The ERP team should be balanced, or cross functional and comprise a mix of external consultants and internal staff so that the internal staff can develop the necessary technical skills for design and ERP implementation. The companies realize the importance of the education and training in order to enable the ERP implementation going forward, for instance, the most simple example is that the training teaches the users how to operate with the new system.
The difference of cultures between Western countries where ERP systems are developed and China where these ERP systems are implemented makes culture an important determinant of implementation success.

9. CONCLUSION

To adapt to today's challenging and competitive business environment, organizations are implementing ERP systems to achieve a capability to plan and integrate enterprise-wide resources in order to shorten lead times, and to be more responsive to customer demands.
Most of the articles stressed that each organization must assess itself, to see if it is ready for ERP. Many organizations that attempt to implement ERP systems run into difficulty because such organizations may not be ready for integration and the various departments within it have their own agendas and objectives that conflict with each other.

Despite the fact that ERP integrates and optimizes the flow of information across the entire organization's supply chain, the implementation of such software packages can be costly, and may even require reengineering the entire business operations.

The picture that emerges from this study is that some factors may be important for French companies were Suitability of software and hardware, top management support and Change management and some other factors may be most important for Chinese companies were top management support, business process reengineering, sufficient education and training and effective project management. The critical success factors (CSF) that were common to both firms through the implementation projects were top management support, sufficient education and training, team work and composition and suitability of software and hardware.

The Internet represents the next major technology enabler which allows rapid supply chain management between multiple operations and trading partners. Most ERP systems are enhancing their products to become "Internet Enabled" so that customers worldwide can have direct to the supplier's ERP system. ERP systems are building in the Workflow Management functionally which provides a mechanism to manage and control the flow of work by monitoring logistic aspects like workload, capacity, throughout times, work queue lengths and processing times.

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