Schneider Electric China: Implementing an Enterprise System to Support Rapid Development

The difference between hell and paradise is whether you have engineering people or not.
(Jean Longeot; Director of Support Operations)

On December 9, 1999, Yves Cizaire, manager of MIS, had just returned from a steering committee meeting where a difficult decision had been made. After having successfully implemented SAP's ERP software package R/3 in the head office and two distribution centers using a phased implementation strategy in which the different functional parts of the software would be introduced one at a time, they would change their implementation strategy to a "Big Bang" approach in which all modules would be implemented simultaneously for implementing the system in the first of their seven joint ventures. Schneider China was in the midst of a transformation process which would put them well ahead of their competitors in the enormously dynamic Chinese market. Glancing over the endless flights of Beijing's new blocky high-rises, Yves Cizaire wondered what lessons could be drawn from the first two phases or their ERP implementation project for successfully realizing their business vision for China.

Company background

The history of Schneider Electric[1] goes back as far as to the year 1836 when two brothers named Adolphe and Eugene Schneider acquired mines, forges and foundries in Le Creusot, France. After 1870 the firm moved into the manufacture of weapons and infrastructure and became one of Europe's leading suppliers in these fields. Further diversification followed at the turn of the century, including investments in cement and electricity. As the company expanded its activities beyond Europe, it also started taking interest in the Chinese market as early as 1895. However, beginning in the 1920s a long period of steady decline punctuated by World War II was only stopped in 1949 when the company was reorganized and refocused on non-military products in the fields of construction, steel, electricity and nuclear power. Despite Charles de Gaulle's declaration in 1959 that Schneider had acquired a position of "leading the national economy", a new process of deterioration set in which could only be halted in 1981 by another effort of reorganization and refocusing. The company shed a substantial part of its businesses while acquiring three firms active in the electricity and industrial control and automation markets. In 1996 the firm had repositioned itself as a world-class manufacturer in these fields owning four renowned brands, Merlin Gerin, Modicon, Square D, and Telemecanique (see Exhibit 1 for Schneider Electric's global leadership positions and Exhibit 2 for consolidated income statements 1996-1999). In 1999, the group's name was changed into Schneider Electric. Henri Lachman, who became CEO in 1999, commented:

> Our new name and logo make the completion of a vital process: Schneider's strategic refocusing on electricity.

Schneider Electric in China

After the (re-)opening of China in 1978 by Deng Xiao Ping, then prime minister, Schneider made its first tentative step into this promising market in 1979 by building China's first high voltage

---

[1] All information in this section is taken from Schneider Electric's web sites (www.schneider-electric.com) which, in turn, draw on "Schneider, l'Histoire en Force" by Tristan de la Broise and Félix Torres, published in 1996 and distributed by Editions Jean-Pierre de Monza, Paris.

transmission line. Its commitment became more visible with the erection of its first joint venture in Tianjin in 1987, the huge harbor city neighboring Beijing, manufacturing low voltage electric equipment. Since then, it has rapidly expanded its operations in China which, by now, comprise seven joint ventures, three distribution centers, and 19 sales offices. In 1995, Schneider Electric consolidated its several activities by creating a holding company, Schneider Electric (China) Investment Co., Ltd. (see Exhibit 3 for a time line of Schneider Electric's expansion in China and Exhibit 4 for an overview of Schneider Electric's geographical coverage of China).

In China, as elsewhere in the world, Schneider Electric's two core businesses are electrical distribution and industrial control and automation, with approximately 70% of sales being generated by its electrical distribution business. Jean Longeot, director of Schneider Electric China (Schneider China) Support Operations, explains:

> The electrical business [ranges] from power generation to the end user of electric power, including applications. And we are in between. We are not in power generation and we are not installing something at the places or systems integrators. … We are in the business of products with industrial customers, not the mass market. With the product defined as such, we are no. 1 worldwide and also no. 1 in China. … The customers might be systems integrators or equipment manufacturers and they sell to the end user which is either the factory or the building or the private person. ... They also might have contractors in between. So this is a very complex [supply chain] and the technology oriented part of it is on the products and that is where we are. And we are only there, which is a little specific.

This business, together with the field of industrial control and automation, involves the manufacture and distribution of a huge number of electrical components (see Exhibit 5 for a sample of Schneider Electric's products). Their total number goes beyond one hundred thousand of which, however, roughly 1500 account for 80% of sales.

Schneider Electric's business in China developed rapidly with sales growth rates between 1994 and 1999 averaging 21% (see Exhibit 6 for the development of Schneider Electric's sales in China). This rapid development creates a unique challenge as described by Jean Longeot:

> Sometimes, when we look at the potential of China, we are frightened; it is so huge, and we still have glasses [for] let's say thousands [but] we cannot read correctly millions. And this is [still] misleading because what we are looking at … is less than 10% of China which is already as big as Japan; and of course, the huge potential is also in the 90%. In this 90% we know that there are tremendous opportunities—we may not see them. So I would say the major challenge is, not to miss opportunities. It is exactly the opposite of what you have in the rest of the world. In the rest of the world, every opportunity is known and we have to fight against the competitors. But in China, [this] is not so much the issue; we may not even see that there is an opportunity. If we see it, we can be very successful.

To recognize and exploit these opportunities implies the necessity of fast decision processes. This, however, is often difficult in China given the traditional structure of joint ventures which, originally, required that the foreign partner and the Chinese partner (usually a state owned entity) share equity more or less equally. Thus, decision making is often hampered by the need to obtain agreement from both partners. Yves Cizaire, director of MIS, describes how Schneider China tried to solve this problem:

> We started our first joint venture with 50.01% [of equity] and arrived at a deadlock. When we started our second joint venture in 1994, we held 60% of equity. We planned to make this transaction with partners who have the same business as we and it was a mistake, I should say. When you have to make business decisions, you need to be able to make it fast. And if you have a partner with 40% who does not agree too much on what you do, he can block you. So now, we are

trying to go to 70, 80, 95%. This is the only way to deal with it. Then we can invest when and as we want. We discovered to have a partner who is a real, active partner is difficult. … We prefer to have partners who make some money but let Schneider decide on the business. … We don't create a new joint venture with less then 80% ... Now we have the ability to manage as we want, to make decisions, because the partner has less risk and so does not care that much. We have a global view of the Chinese market; the partners only see their specific market. This can cause very different views on business decisions.

Notoriously, multinational firms doing business in China are plagued by the difficulties involved in recruiting and retaining competent personnel. It is often assumed that Chinese employees, especially professionals, are opportunistic job hoppers with little sense of loyalty for their firms. Jean Longeot begs to differ:

I believe [this] is not true, although it is what is visible. What is true is that Chinese people like to be a member of a community, but there are many conditions. They have to be [able to be] proud of their community every minute of their life. Even one hour of lack of pride is already an intense suffering. The well educated ones … would love to have a long term relationship with a company. I would even say [that] because they are expecting so much from the company, they can be so deeply frustrated that they will quit. If you can find the secret of [enabling them] to continue to have a positive feeling of belonging, you [get a] tremendous team. This is my strong believe. … We have been mislead by Hong Kongnees; they are … trained by the British with salaries closer to Americans than to Europeans; and Hong Kongnees where the ones who taught us, as foreigners, what it is like to be Chinese. I think they were wrong in almost everything. … I was so surprised when I saw candidates, very high level ones, not beginners; sometimes, they were so enthusiastic about joining the team that they were not even discussing salaries. They were not even interested to know. Some of them accepted lower salaries—so how does this fit with what the Hong Kongnees were saying? This is the real difficulty, how to make it worth for [Chinese employees] to stay a long time.

The China Logistic System-Project (CSL)

Before coming to China in mid 1996, Jean Longeot was vice president for support operations and logistics worldwide. Sending 'over-sized', high caliber managers to China was a deliberate decision since it was felt that, in order to match the rapid development of business in China, it was necessary that managers develop this business which would match its magnitude in a period of five years ahead.

This was in line with a strategic decision made by Schneider Electric in 1993 to significantly reduce the influence of strategic business units in favor of country management. As a consequence, Schneider China changed the way its joint ventures were organized drastically. Whereas before the joint ventures were reporting to central SBUs, they were now integrated in a holding structure and reporting to the country manager Harry Hellawell (see Exhibit 7 for Schneider Electric's organization structure worldwide and Exhibit 8 for Schneider Electric's organization structure in China). As Jean Longeot keeps saying:

"We are not an aggregation of joint ventures, but a company with joint ventures".

The mission of Jean Longeot was to create the operational infrastructure supporting this new strategy. Deeply inspired by the TQM[2] philosophy, he set up a team of engineers working in the newly created department 'Support Operations' whose task was to look at the total of Schneider Electric's China operations from a process perspective. Based on their analysis, a strategic decision was made to

---

[2] Total Quality Management: Inspired by Japanese management methods, TQM emphasizes the process perspective of quality management rather than the "American" focus on quality control and inspection.

centralize all sales and distribution activities in China. Before, each joint venture would sell and deliver its products independently to its customers which implied that the same customers would deal with several of Schneider Electric's joint ventures as if they were independent firms. As Jean Longeot explains:

> The initiative started from the department which is in charge of engineering processes, and if you are looking at the processes of a company, you find that the logistic process is urgent, is very important. So it was obvious. It's not a very original strategic decision; as soon as you have people really looking at processes, they come to this decision [to centralize sales and distribution activities], and we were the ones to implement it.

Implementing this strategy required to build strong logistic competencies which was the one thing Longeot considered to be of utmost importance upon his arrival in China:

> The HR strategy which I implemented is *the* thing which I am proud of. I took very high level people, highly educated, [but] inexperienced. With an experience of a few years so they are mature (they know what it [means] to work in a complex environment), but they had no experience in logistics, I could not find them. So I said to the HR department, hire excellent guys; I don't care in what they are excellent, but I want them to be excellent. And these people learned so fast … We provided them with a lot of training, particularly the engineering [people]—and there is another success factor, which is on each site we are starting I always separate the job between the people in operations and the people who are in engineering; the people in engineering were on the site, so were hit by the same little accidents every day, but their duty was that it would not come back again, and the duty of the operations people was to serve the customer every day. Having these two teams permitted them to succeed. Starting a distribution center in every country is terribly dangerous; the normal situation in the beginning of a distribution center is total chaos. And we avoided it. After two months the quality of service was high. There was no chaos. And I think it was due to these talented Chinese people. Also, there was nobody to tell them how it was done in France or in the US - so, no temptation to copy. …

It was decided that, rather than having just one distribution center, there should be at least three. The first one was located in a Shanghai Free Trade Zone and started operations in April 1998. It focused on importing products which were not made by any of the Chinese joint ventures (about 20% of total sales in China). In 1999, a second one in Beijing was opened. Longeot says that

> .. this one is really the image of what we want to have ultimately; it is starting [to] distribute imported products via [the distribution center in Shanghai] but they stock it in Beijing and the products from joint ventures and we go to the point where there will be not any stock of finished products in joint ventures. The stock of the joint ventures is in the logistics centers. So the strategy is we load a very powerful logistic system which is taking orders, stocking, procuring … [delivering, and invoicing].

In 2000, a third distribution center has been opened in Guangzhou (Kanton). In spite of having created these distribution centers, Schneider China would not replace its existing network of 300 distributors covering the whole country. As Longeot explains:

> … [their] roles are different. The distributor is there to make a product available in two minutes. Our duty is to make it available, potentially, in one day.

Implementing this strategy required that Schneider China replaces its existing logistics information system with an integrated system, i.e. an enterprise system or, as it is commonly known, an enterprise resource planning system.[3]

The ERP implementation decision

When Schneider China began to implement the new strategy, its information systems infrastructure was characterized by a high degree of fragmentation. Most of the joint ventures were relying on a PC-based planning system called Fourth Shift which had been implemented with the support of the MIS department under the direction of Yves Cizaire. The distribution center in Shanghai used an internally developed logistics package called SDS (Schneider Distribution System) and the finance department used another PC-based system (CIEL) for financial reporting. This fragmented IT landscape reflected the historically grown organization structure in which joint ventures operated independently, loosely held together by a collection of financial controls.

The decision to implement a full-fledged ERP system has been a gradual one. Upon his arrival in September 1997 in Beijing, the new finance director, Phillippe Degrave, found a note on his desk left by his predecessor saying that his first decision should be which new accounting software the firm should use. Phillippe Degrave explains:

> At that time, the holding company was not so big and we were using a PC-based accounting software from France and obviously it was getting too small … So we had to change to another software … [The logistics issue] had been in the background. We knew that sooner or later … we would have a logistics [center]; but it was not clearly in the picture yet. … We knew that we would need a software package for the holding [and] we knew that we would need a software package for this logistics entity but we didn't know yet when.

However, the logistics project was setting the frame for choosing the finance software solution:

> In my mind, it was not about finance, but it was about giving Schneider China an MIS bone which would allow us to grow. (Phillippe Degrave)

Yves Cizaire comments along similar lines:

> The basic need had been to accommodate growth in a more efficient way. Without that [an ERP system], we could not grow.

In more specific terms, the necessity to implement an integrated ERP system stemmed from the managerial integration of business activities in China rather than from the centralization of its logistic operations. It would have been possible to handle logistical operations by the distribution centers with the SDS software. But it would not have been possible to obtain financial information for all Chinese business activities on a level of detail required for managing Schneider China "as a company with joint ventures" rather than an "aggregation of joint ventures", i.e. as an integrated business entity. Jean Longeot describes that situation as follows:

> If there were no special needs from finance, we would have kept SDS which is fit to our need. But because there was finance, we needed an integrated one, at least between finance and logistics. And, of course, we knew that once we would have it, we would love to have it in the JVs. The JVs would not love it but then we would go on the way which is what we'll do but it will take years.

---

[3] On ERP systems, see Austin, Robert D.; Escalle, Cedric X.; Cotteleer, Mark (1999): Enterprise Resource Planning (ERP), Technology Note #9-699-020.

The ERP implementation process

Vendor selection

As for the vendor selection, the decision has been made in a step by step fashion too. In December 1997, Degrave and Cizaire investigated three packages which were on a short-list provided by Schneider Electric headquarters (as the ERP implementation project was started as a finance project, Longeot was not directly involved in this decision). One system was excluded because it was felt that it was not a truly integrated system. A second system was considered not to be sufficiently supported locally. SAP's R/3 system was thus chosen as it was highly integrated and fully supported locally although all involved managers thought it to be the most complex one and the most difficult one to implement.

Thus, when the finance module of R/3 (see Exhibit 9 for an overview of the R/3 structure) was being implemented in the first site (the distribution center in Shanghai), the final decision regarding the ERP vendor was still pending. Yves Cizaire elaborates:

> In the beginning of 1998 we implemented FI [the R/3 finance module] and then saw how it was running and if it was possible to make it. … In April 1998 I asked SAP to make a plan for Greater China. When we started with SAP, we thought this is a tool for the next five to ten years. In May I prepared how we are going to implement this tool. But first I needed to know how SAP was [running]. I presented the plan to the GM in the beginning of June. When we started with [finance], we [already] planned to implement MM/SD [the logistics modules], but the JVs didn't know. Only when we were sure that it was workable and the GM decided it was possible, we informed them. The [JVs] were not involved in this decision. It was not a shared decision but a centralized decision.

An incremental approach

This method of vendor selection already implied a phased implementation strategy, i.e. the implementation of the several modules one after another; moreover, one module would not be implemented in all sites simultaneously; rather, specific sites were selected to serve as test installations ("pilots") and successive implementation activities would be initiated contingent upon prior experiences in these pilots (see Exhibit 10 for an overview of implementation phases and sites and Exhibit 11 for the functional scope within the modules to be realized in Schneider China).

Thus, in January 1998, the financial modules of SAP's R/3 were beginning to be implemented in the Shanghai distribution center at the same time as SDS was implemented to support this distribution center's logistical operations although it was already clear that later the logistics modules of R/3 would replace the SDS system.

The main reason for this approach was that the two projects, CSL (China Logistic System) and ERP, were about to be implemented simultaneously. Adopting a phased implementation strategy would reduce the risk involved in creating a new distribution center from scratch while implementing an Enterprise System since SDS was tailor-made for Schneider Electric, protecting Schneider China from bad surprises. However, the strategy was not undisputed internally, as Phillippe Degrave points out:

> We started as a finance only project because in the meantime we finally decided to do this logistic project in the first half of 1998; but they also decided to [first] not use SD [the R/3 distribution module] but to use [SDS]. … I tried to convince Longeot to start an integrated SD/FI project … because what I understood [is] SAP is … one big thing [and] if you only take a part you have to cut the links … it's not like a zipper, it's knitted [together] …

The next step was to implement the R/3 finance modules in the holding office including regional sales and representative offices since they belonged, in legal terms, to the holding company. Next, the second distribution center in Beijing was selected as a pilot for the R/3 logistics modules because it was physically closer to the head office so that it could be monitored more closely. Here, however, building the new distribution center and implementing the new logistics modules of R/3 went hand in hand.

The team

The first phase of the implementation process had been driven by an expatriate with 20 years of experience in finance and considerable experience in China, helped by a small internal team of two MIS people and three people from finance. Her professional experience allowed her to evaluate the solutions suggested by the external consultants who, for the first phase, had been hired from SAP, against a benchmark of what should be possible with a powerful financial software tool. According to Phillippe Degrave

> … she knew exactly what she wanted ... She had the feeling of what SAP could give because most of the time when you ask something they [the consultants] say it is not possible. But you know it must be possible because a software of that kind must do that. But the first reaction is often that it is not possible. She had already worked with very powerful tools [so] she knew that this answer was not very satisfactory. She said you cannot say that to me. I want that you find a solution. So after three or four days the consultants finally came back with a solution.

However, she left in July 1998 so Degrave put a Chinese manager in charge of the project who, however, he felt was not very confident in himself. So he sought some external support which was then provided by a consultant from PwC (PricewaterhouseCooper) who would come two to three times per month for a period of six months, i.e. until the finance module had been implemented in the head office as well as in the regional sales and representative offices.

Through this way, Schneider China developed a good working relationship with PwC so that Schneider China asked PwC to help them for the second and the more complex phase of the project, the installation of the logistics modules. However, Schneider China wanted to build its own ERP implementation competence in order to reduce dependency on external consultants and lower costs. Therefore, PwC provided some guidance but the main consulting job has been performed by so-called internal consultants who belong to the MIS department and who specialized each on one R/3 module (see Exhibit 12 for the composition of the logistics implementation team).

Specific to this project was the choice of team members who would represent the functional departments. Generally, these roles would be performed by knowledgeable users, so-called key users. Due to the ERP implementation project being embedded in the wider CLS project, however, Schneider China charged an engineering team, the so-called OMC (order management cycle) group located within the Support Operations department, with the task of analyzing and redesigning Schneider China's logistical process. Yves Cizaire explains the role of the OMC group, who were also called super key users, as follows:

> The OMC group has been part of the mechanism to support this interaction and communication [between the users and the MIS people]. For example, when we prepared the process flow, it was with the OMC people. OMC was going to see what the … users were doing and then working with MIS. In fact, we consider the OMC people as the key users, a [kind of] super key user. Because we think that these people have to do … the next implementation, they can learn what is the process [like], have an idea of the process and can make it to be sped up together with the consultant.

Jean-Francois Asseur, the PwC co-project manager, comments on potential problems resulting from this choice of key users:

It could have [caused some problems] but it didn't because in fact the [super] key users spent a lot of time working in Shanghai [and] Beijing; they are all part of the logistics group headed by Mr. Longeot and so the communication was very good … the risk could have been that they could have been disconnected … as project managers we want to get the best people from the client site in our project not only because we are selfish but in order to make the right decisions; the people need to know the business and in order to be able to sign off the people need to have the trust of the department; so if you recruit a junior team … who doesn't have the trust of [the] department then you take the risk that the design will not be smart … or be rejected; … It sometimes happens that you have to fight with the organization to get the right people. Here it was a bit different because even if they were not real key users they had all the skills and then they knew the business simply because of the communication and the structure of the logistics team.

However, Phillippe Degrave voices some concern about this choice of key users:

Something which is often a problem with SAP and something which very much concerns me today is that I wouldn't want to use ... my Ferrari in a Hutong[4] ... means that I wouldn't want to use SAP as it should not be used and I am afraid that with very young and inexperienced people, people who have no idea of what this software should do, that we will use it on a very low level basis. We should use SAP to go one or two or ten steps further, to use it having in mind what will be in 2005; ... sometimes I have the feeling they just don't have that vision. So they try to solve the issues of today ... having no idea of what will be in 2003 or 4 or 5.

The steering committee

The steering committee comprised the director of Support Operations, Jean Longeot, the finance director, Phillippe Degrave, the MIS director, Yves Cizaire, and the senior PwC consultant, Jean-Francois Asseur. Originally, the sales director had also been involved but his position was vacant since June 1999. Albeit it was planned that the steering committee meets once a month, it actually met only about every other month. Yves Cizaire describes the role of the steering committee:

The SC reviews all the issues. I present what is the status of the project and raise the issues which I think should be discussed.

However, Phillippe Degrave considers the steering committee to be not properly performing as such:

The steering committee is not really working. It is not efficient. I don't know exactly why. … It is not working because we don't make decisions. We are informed. For me a steering committee is not an information center, it is a decision maker. And we are not making decisions.

In this context, Degrave mentions the one implementation problem that caused the biggest distortions in the logistics operations, the so-called indent problem.

The "indent" problem

Once the scope of the project and the hardware architecture are defined, the main activity in any ERP implementation process consists of customizing the ERP system (see Exhibit 13 for a description of the hardware infrastructure of Schneider China's ERP system and Exhibit 14 for a description of the customization process). The main difficulty in customizing an ERP system is to ensure that the required business processes can be efficiently handled by the system while, at the same time, making use of the accumulated business process engineering knowledge embedded in the system. However, frequently a gap remains between the processes as enabled by the software and the requirements of the existing or desired business processes. Then, the costs of changing existing organizational processes and structures regarded to be efficient have to be traded off against the benefits of having

---

[4] Small alleys typical for the old Beijing cityscape.

processes more in line with the system's capabilities. Similarly, the costs of changing the software have to be traded off against the benefit of having software which better fits specific business requirements. In general, Schneider China has opted for changing the software in more cases than it has chosen to change business processes. Li Zhong, the project manager for the ERP implementation process, reflected on this trade-off:

> We use SAP standard functions for only part [of our processes] and developed a lot of programs by ourselves to enhance the standard functions and to fulfill our users requirements. … I think it was a quite expensive experience. Maybe next time we will … try to use the standard functions [more].

Specifically, one problem occurred which, according to Jean Longeot accounted for 60% of all problems encountered in the implementation process. The problem concerns a specific ordering process called an indent order. Degrave explains:

> We also have very specific products that we won't stock. When someone wants them, we will order them specifically from France for this customer and when they arrive in our warehouse we take them and ship them to this customer, this is called 'indent' in Schneider. … If that customer finally doesn't want the product, it will be scrapped, sooner or later. In SAP, when you order from stock, it's no problem. … . When it is an indent or a "delivery to order" order, in this version of SAP,[5] the product doesn't go to the stock. At the minute you receive it, it becomes a cost of goods sold … as if it doesn't go to your warehouse which, I guess, in Europe wouldn't be a problem because when we have that kind of order, we ship it immediately to the customer. But in China, that's not the case because we sell mostly by cash on delivery, so we only ship when we have received the money. … So these indent products, they are stocked, … sometimes for months; if we had used the normal process of SAP, they would not have been in the inventory but in the cost of goods sold, but with no sales, so we would have had distorted inventories, wrong cost of goods sold, wrong margins, wrong profits, wrong everything.

Upon the intervention of Degrave, a decision was made to use the 'delivery to stock' process rather than the 'delivery to order' process. Longeot comments:

> We made the choice 'delivery to stock' because when you are in the process 'delivery to stock', everything which is in the warehouse belongs to you. Doing that, we lost the link between a sales order and a purchase order. We wanted to be nice with finance, because we knew they suffered a lot, they were never able to have the real value of their stock, which is criminal for finance people …

Loosing the link between the sales and the purchase order implied that some customers could not be supplied because their order got lost or the products ordered by them had been taken to fulfill another order. In-time deliveries temporarily dropped from 95% to 87%. Initially, the problem had not been that big. The new logistics system was first implemented in the Beijing distribution center where the problem had already been identified. However, adding the orders of one joint venture to be distributed via the new distribution center much sooner than originally scheduled worsened the problems dramatically since orders from this joint venture included a higher share of indents than was normally the case. The problem was finally solved by an additional batch program which has to be run once a day but it took some time to sort out the difficulties which were created in the one week in which the problem built up without having been solved.

---

[5] Schneider China hasn't implemented the most recent version of R/3 because it was, at the time of implementation, new and thus untested in the Chinese market. The trade-off decision described in the main text does not have to be made in the successive versions of R/3, that is in versions higher than R/3 3.1H.

Although this issue implied such far reaching consequences, it had never been discussed in the steering committee. Jean-Francois Asseur explains:

> This problem has not been brought to the steering committee per se but a steering committee member was part of the working group [which was specifically set up to address this problem], the financial manager was there, the MIS director was there, the logistics director was not there but he delegated the distribution center manager to represent him. We didn't wait for the monthly steering committee meeting to resolve this issue but we brought the members of the steering committee [into the decision process] because it was a significant decision that had to be taken by the people from the steering committee.

Similarly, Degrave comments:

> One reason for this is the speed of the implementation process. Compared to implementation projects in Europe, this implementation had been very fast which also implies that one cannot always wait for the next steering committee meeting to make an important decision.

However, with hindsight, Jean Longeot says that, if he had anticipated these problems:

> I would never have accepted [this solution] … Customers are yelling. Just for … the quality of analysis of margins it is not a good recipe to have customers suffer so much—and, logistics people [spent] nights and weekends [to solve the problem]—they are tired, consequently one had an accident last week ... Our team is close to the dangerous phase. We have not yet reached it but I try to be very very careful …

The data conversion problem

The last step before 'going live' consists of transferring the data from the old system to the new system, the so-called data conversion (see Exhibit 15 for an ERP implementation phase scheme suggested by SAP's 'ASAP' methodology).[6] Apart from the technical intricacies involved in this task, one possible problem which might pop up in this phase is the problem of data quality as it turned out to be the case for Schneider China. In contrast to R/3, SDS allowed for a higher degree of flexibility when entering data. For example, it was possible to 'create' an order (document) without a link to a product reference. In R/3 this is not possible, the system wouldn't continue to process the order document unless such a link (a 'reference' as it is called) is established in the document. Similarly, R/3 has a number of automatic controls for entering data, for example rebate data which, as configured in Schneider China's case, must not exceed 30%. In SDS, no such controls existed so that frequently much higher values were entered. Accordingly, these data caused processes to stop in R/3 which would run smoothly in SDS. Thus, data conversion not only implies moving data from one file into another and making sure that the structure of the data remains intact but also ensuring that the contents of the data complies with standards required for running the new system, i.e. controlling the correctness of data on the semantic level as well as on the syntactic level.

Given the sheer amount of data in any transaction system such as an order processing system, this task can be daunting. Actually, the only way to do it, apart from checking each instance of data one by one which would be prohibitively expensive, is to make a full-fledged test conversion, i.e. to move the whole data base to the new system and run the system under real-world conditions before actually 'going live' or, as it is termed in Schneider China, 'cut-over'. Schneider China didn't do that because of the time and effort implied in this task. Yves Cizaire reflects on this decision:

---

[6] Of course, if the firm moves from a purely paper based system to a computerized system, this step is not necessary, as is the case for many Chinese firms and as it was the case for the Shanghai distribution center.

When we prepared cut-over, we asked everybody "[are the tests] okay?" and everybody said "it is okay, I am ready". And we discovered that for the previous system the people know their small part but they didn't know what was wrong … We should have done a real conversion … we didn't; we made some test conversion but not a real one because that is very time consuming because that would mean that you take all the team plus a big part of the heavy users on the conversion; that could take one week. It is very difficult to get that amount [of resources] because the people say they are ready and they are on their own work. We thought we could escape that phase; it was a big mistake, my mistake, I should have forced [them].

In addition, while working on the data quality problem after cut-over, the MIS department didn't communicate enough with the users to inform them about the problem so they continued to enter data in an, in terms of R/3, invalid format which aggravated the problem. Accordingly, one major lesson which Yves Cizaire has learnt is:

> [Stick to] a logical implementation [method], even under stress. When we had the data conversion problem, we did not communicate to the users because we were under heavy pressure. So they were already using the system and thus continuously creating new problems (because they did not stop to do the wrong things). It took us one month to go out from that.

Project outcomes

Although some significant problems emerged in the implementation process, Schneider China has succeeded in realizing its original plan, namely to create the "MIS backbone" required to support the new strategy of centralizing all sales and distribution activities in China, i.e. to create a "company with joint ventures" rather than being an aggregation of joint ventures, an organizational whole which can be managed as one entity. The contribution of the ERP implementation had been to enable Schneider China not only to handle the logistics involved in this project, this would have been possible with the old system SDS either, but also to manage this entity from a business point of view. That is, the integration of Schneider China's logistics and financial system was at the very center of this project and this integration is what has been achieved at the end of this phase of the project in November 1999.

Moreover, project management targets have also been broadly met. Due to the "indent problem" and the "data conversion problem", the implementation in the Shanghai distribution center was one month behind schedule. Given the speed of this implementation process (six month for the implementation in the Beijing logistics center, five month for the Shanghai logistics center) and the magnitude of the problems, this was not an easy feat. In addition, the implementation was "in budget", meaning that the problems could be successfully handled without increasing the resources devoted to this project. Yves Cizaire comments:

> Although I have implemented large information systems before, I expected to have some bad surprises because everybody kept telling me that implementing SAP is very difficult and costly. But I was quite happy [they didn't come]. I think [SAP] is not so difficult to implement; it has the same problems as all the other software [products]. …In China, the decision lead time is very short. … When we had some problems, we should have foreseen them. It was not a problem of SAP. It is all management and preparation …

Regarding the integration of finance and logistics, Phillippe Degrave comments on the outcome of this project:

> For Finance, the outcome is very satisfactory. Most of the objectives have been achieved. Objectives had been the number of users online and extent and depth of financial information. For example, now expenses can be looked up in real time for any category or site [included in the

holding]. Before, each site [representative offices etc.] created financial data in Ciel on a PC [based on Excel] which were consolidated monthly in an Access database. Moreover, now group and statutory accounting are integrated [since different rules are used for the group and within China there was much duplicate work before]. Finally, all evaluations should be consistent, especially with regard to inventories.

Questioned about the possibility of increased control over joint ventures once they would have implemented R/3 as well he remarks:

> For Finance, one of the biggest advantages is to have a common language which is very difficult if one uses several systems. For example, every JV has its own chart of accounts. The control, we would have had anyway; but it makes discussion much easier. … In my mind, it is not about increasing control. I do not want to be the big brother.

However, from a user perspective, some degree of dissatisfaction was noticeable. Although Li Zhong, the project manager, claimed that users considered the system as convenient, Gong Lian, the SD key user, thinks that end users have to manage an increased work burden as a result of the implementation project due to the specific way in which the indent problem had been solved. Also, she says that whereas in the Beijing distribution center, where users didn't use another system prior to the implementation, users are enthusiastic about the system, users in the Shanghai distribution center regard it as more complex than their old system (SDS). Moreover, she reports that end users from the distribution centers would have liked to be involved earlier in the project and would have preferred more intensive training (they had received two weeks of training before cut-over administered by the key users). Finally, she expresses some discontent with the consultants who, according to her opinion, should have predicted the magnitude of the indent problem and lacked the expertise to solve it satisfactorily. She comments on the solution which was finally implemented:

> The end user is the victim of this decision. It is unfair for the end user.[7]

Future challenges

The next step will be to implement R/3 in all seven joint ventures. Senior managers anticipate some problems which, however, they think can be overcome. Specifically, some general managers are likely to resist the implementation of R/3 on the grounds that their degree of autonomy might be decreased as a result. However, Degrave explains how Schneider China plans to overcome this possible source of resistance:

> We are not in a situation that we are blocked. We can start with those that are more open and that is what we are doing. We have limited resources so we cannot do everything at the same time so we can choose the JVs we start with ... we know that we have resistance but this is not yet a problem. And at the time it will become a problem they will not be able to resist anymore. It will be like a domino.

Probably a more serious source of resistance by the joint ventures, though, could be the fact that they are going to loose control over sales and distribution once the strategy will have been fully implemented. As Jean Longeot explains:

> … it was said from the beginning [that sales and distribution will be centralized] but probably they didn't realize that we were serious. So, piece by piece it started. When you create a logistic system, it's positive; nobody is expecting that it is going to be better for almost everybody; but when you have a logistics system, you find very quickly that you don't need logistics in the JVs

---

[7] The problem had been solved by installing an upgrade of R/3 (version 4.5B) in May 2000 which can handle both types of orders satisfactorily.

anymore. We are at this point where they find, hey, we don't need logistics anymore, what are we going to do?

Finally, the success of the next phase of the implementation project would crucially hinge on the motivation and expertise of the project team members. Schneider China's goal was to establish a small competence center of internal SAP consultants and business process experts. However, as Phillippe Degrave remarks:

> We know we are training people but ultimately they will use their knowledge to implement SAP somewhere else. … We try to give them good salaries but you know you can always find somebody who can put 20, 30 or 50% more on the table because when you want to implement SAP the resource is key in China. We cannot pay them 50 thousand RMB. We try to give them good salaries but I am sure they can find better ...

When Yves Cizaire pondered about these future challenges he wondered which lessons could be learnt from the first two phases of the implementation project. The steering committee had just made the decision to use a "Big Bang" implementation strategy for implementing R/3 in their first joint venture although originally they had planned to use a phased implementation strategy as in the previous phases. Which problems could be anticipated from this change in implementation strategy and how to overcome them? More specifically, was it necessary to review fundamental decisions and concepts of the implementation project such as the concept of the super key user, the role of the steering committee, and the plan of creating a team of internal SAP consultants? How to motivate the team members anew given their degree of exhaustion after the first two phases had been accomplished? How to prevent them from leaving the company?

The implementation had been a remarkable success so far and has laid the foundation for building a unique strategic position in the Chinese market which would take their competitors quite some time to catch up. But fully implementing their strategy still required a long way to go.

Exhibit 1: Global leadership positions in strategic business segments

Market position	Transmission and Distribution	Low Voltage Power Distribution	Low Voltage Final Distribution	Industrial Control	Programmable Logic Controllers
1	ABB	**Schneider**	**Schneider**	**Schneider**	Siemens
2	GEC-Alsthom	Mitsubishi	Siemens	Rockwell	Rockwell
3	Siemens	Eaton	ABB	Siemens	**Schneider**
4	**Schneider**	GE	GE	Fuji Electric	Mitsubishi

Source: Schneider Electric

Exhibit 2: Schneider Electric key financial data, 1996-1999 (in billion euro)

Year	1999	1998	1997	1996
Sales	8.4	7.6	7.2	6.7
Operating income	1.1	.85	.76	.59
Net Income	.48	.41	.34	.21
Current Assets*	5.1	4.5	4.7	4.0
Total Assets*	10.3	8.3	8.6	7.8
Current Liabilities*	3.6	3.3	3.2	3.2
Shareholders' Equity*	4.3	3.6	3.6	2.8

* As of Dec. 31

Source: Schneider Electric

Exhibit 3: Time line of Schneider Electric in China

1979:   1st extra high voltage transmission line in China: Ping Ding Shan Extra High Voltage Licence.

1983:   Tian Shui Telemecanique Contactors Licence (now expired).

1987:   Establishment of first joint venture in Tianjin (TJMG).

1991-1993: Establishment of Merlin Gerin Representative office in Beijing and Shanghai. Telemecanique Representative office in Beijing, Shanghai and Wuhan.

1994:   Establishment of Schneider Wuhan technical training center, 4 Regional Offices.

1995:   Establishment of Holding Schneider Electric (China) Investment Co., Ltd. and four joint ventures (SSIC, SSPA, SSLVTA, SSG).

1997:   Establishment of SBMV, SBLV joint ventures in Beijing. Establishment of Schneider (Shanghai) Supply Company Ltd.

1999:   Establishment of China Logistic System Beijing and Schneider Electric Low Voltage (Tianjin) Co., Ltd.

2000:   Establishment of a joint training & research center between Schneider Electric and COACE of Tsinghua University. Establishment of SECI Guangzhou Branch Logistic Center (DCGZ).

Source: Schneider Electric China

Exhibit 4: Schneider Electric locations in China

15

- 3 Branch Offices
- 16 Regional Offices
- 8 Joint Ventures
- 3 Logistic Centers
- 1 Training Center
- More than 300 distributors
- 2300 staff

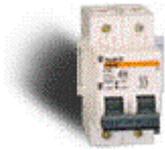Source: Schneider Electric China

Exhibit 5: Sample of Schneider Electric products

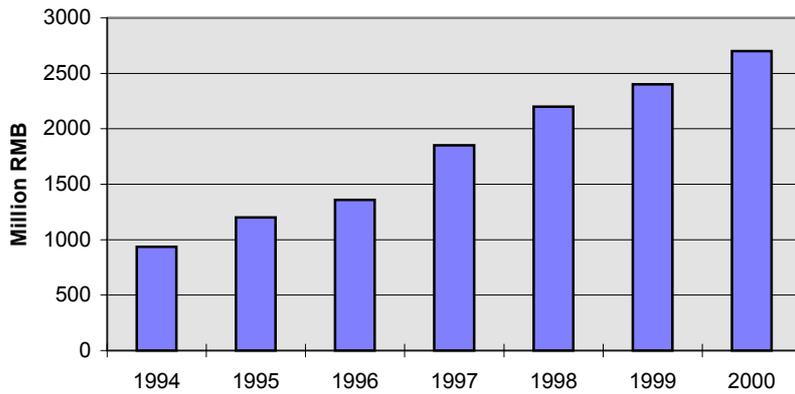Medium voltage switchgear

A transformer for power generation

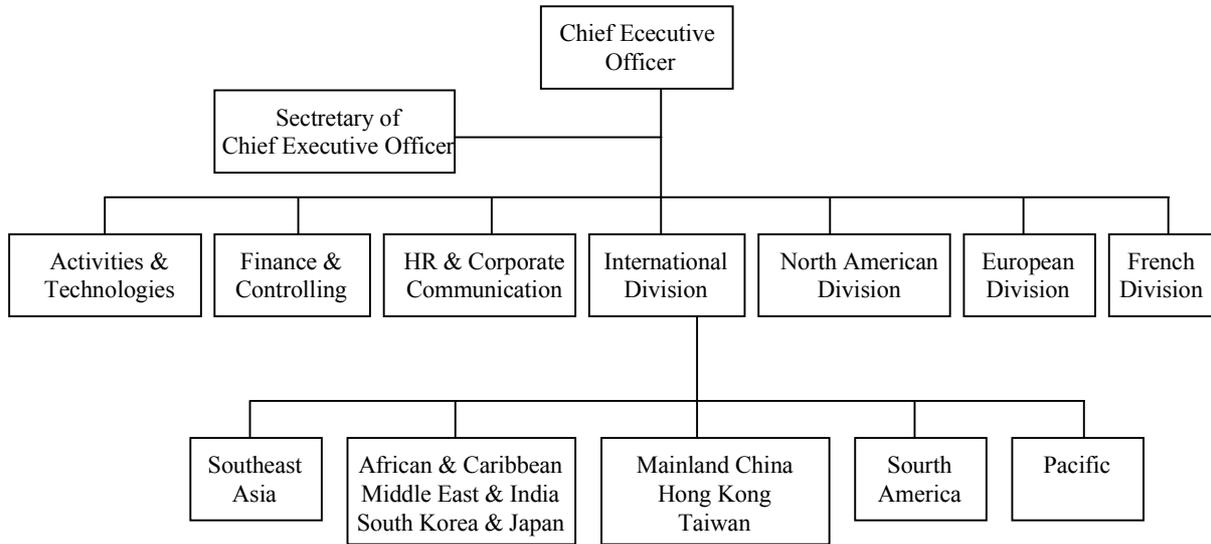Low voltage distribution product

A circuit breaker

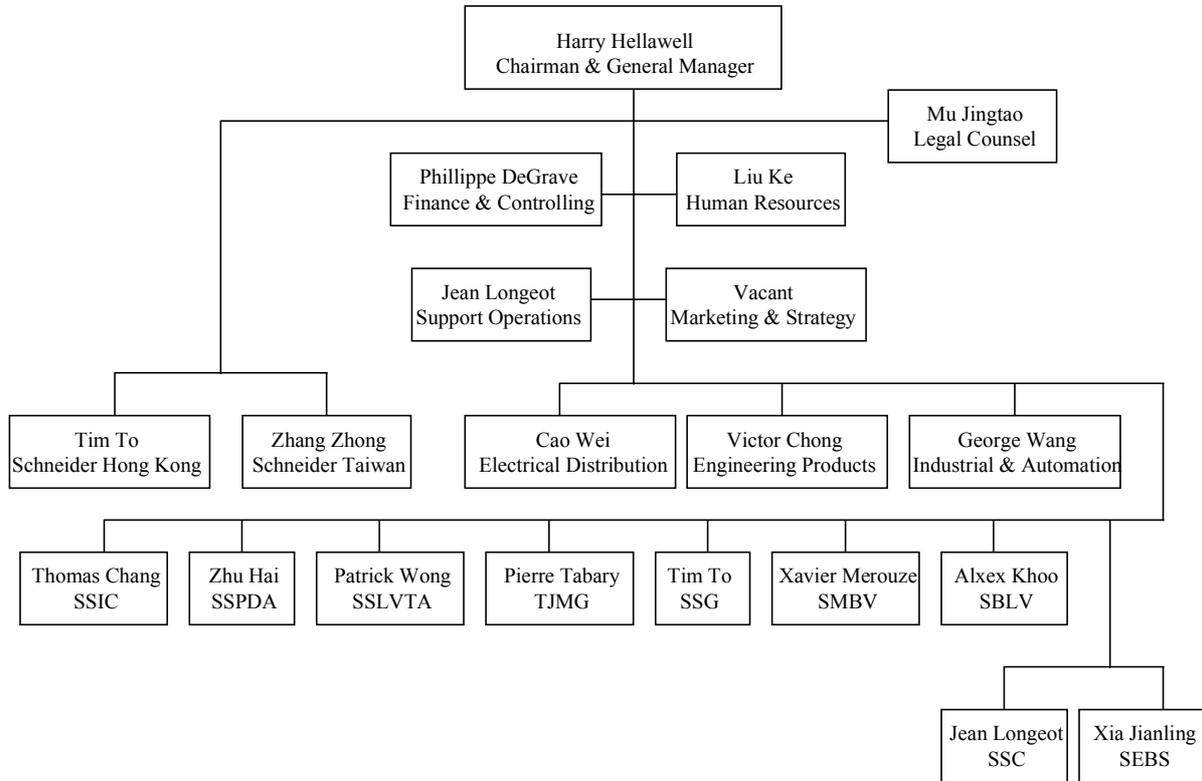Source: Schneider Electric

Exhibit 6: Schneider Electric sales in China

Source: Schneider Electric China

Exhibit 7: Organization structure Schneider Electric

```
                          ┌──────────────────┐
                          │ Chief Ececutive  │
                          │     Officer      │
                          └──────────────────┘
        ┌──────────────────┐       │
        │  Sectretary of   │       │
        │Chief Executive Officer   │
        └──────────────────┘───────┤
   ┌───────┬───────┬───────┬───────┬───────┬───────┬───────┐
┌──────┐┌──────┐┌────────┐┌──────────┐┌──────────┐┌────────┐┌────────┐
│Activities &││Finance &││HR & Corporate││International││North American││European││French │
│Technologies││Controlling││Communication ││  Division  ││  Division  ││Division││Division│
└──────┘└──────┘└────────┘└──────────┘└──────────┘└────────┘└────────┘
                              │
     ┌────────┬────────┬──────┴──────┬────────┐
┌────────┐┌──────────────┐┌──────────────┐┌────────┐┌────────┐
│Southeast││African & Caribbean││Mainland China││South  ││Pacific │
│  Asia  ││Middle East & India││ Hong Kong  ││America││        │
│        ││South Korea & Japan││   Taiwan   ││        ││        │
└────────┘└──────────────┘└──────────────┘└────────┘└────────┘
```

Source: Schneider Electric China

Exhibit 8: Organization structure of Schneider Electric China, 1999

SSIC: Schneider Shanghai Industrial Control Co., Ltd.
SSPDA: Schneider Shanghai Power Distribution Apparatus Co. Ltd.
SSLVTA: Schneider Shanghai Low Voltage Terminal Apparatus Co.
TJMG: Tianjin Merlin Gerin Co., Ltd.
SSG: Schneider Swire (Guangzhou) Electrical Equipment Co. Ltd.
SBMV: Schneider (Beijing) Medium Voltage Co., Ltd.
SBLV: Schneider (Beijing) Low Voltage Co., Ltd.
SSC*:   Schneider (Shanghai) Supply Co., Ltd.
SEBS*:   Schneider Electric (Beijing) Supply Co., Ltd.

* Distribution center

Source: Schneider Electric China

Exhibit 9: The R/3 modules

Logistics

SD: Sales and Distribution
MM: Material Management
PP: Production Planning
QM: Quality Management
PM: Plant Maintenance

Finance

FI: Finance
CO: Controlling
TR: Treasury
PS: Project System
IM: Investment Management
EC: Enterprise Controlling

Human Resources

HR: Human Resources

Cross-sectional Applications

WF: Workflow Management
IS: Industry Solutions

Source: SAP

Exhibit 10: ERP project phases and sites

Module	Location	Start time	End time	Partner
FI/CO	Shanghai distribution center	1997.12	1998.4	SAP China
FI/CO	Head office, four representative offices, Hong Kong office	1998.4	1998.10	SAP China
SD, MM	Beijing distribution center	1999.1	1999.6	PwC, internal consultants
SD, MM	Shanghai distribution center	1999.7	1999.11	PwC, internal consultants
PP	Tianjin joint venture	1999.10		mainly internal consultants plus support by PwC

Source: Schneider Electric China

Exhibit 11: ERP project scope
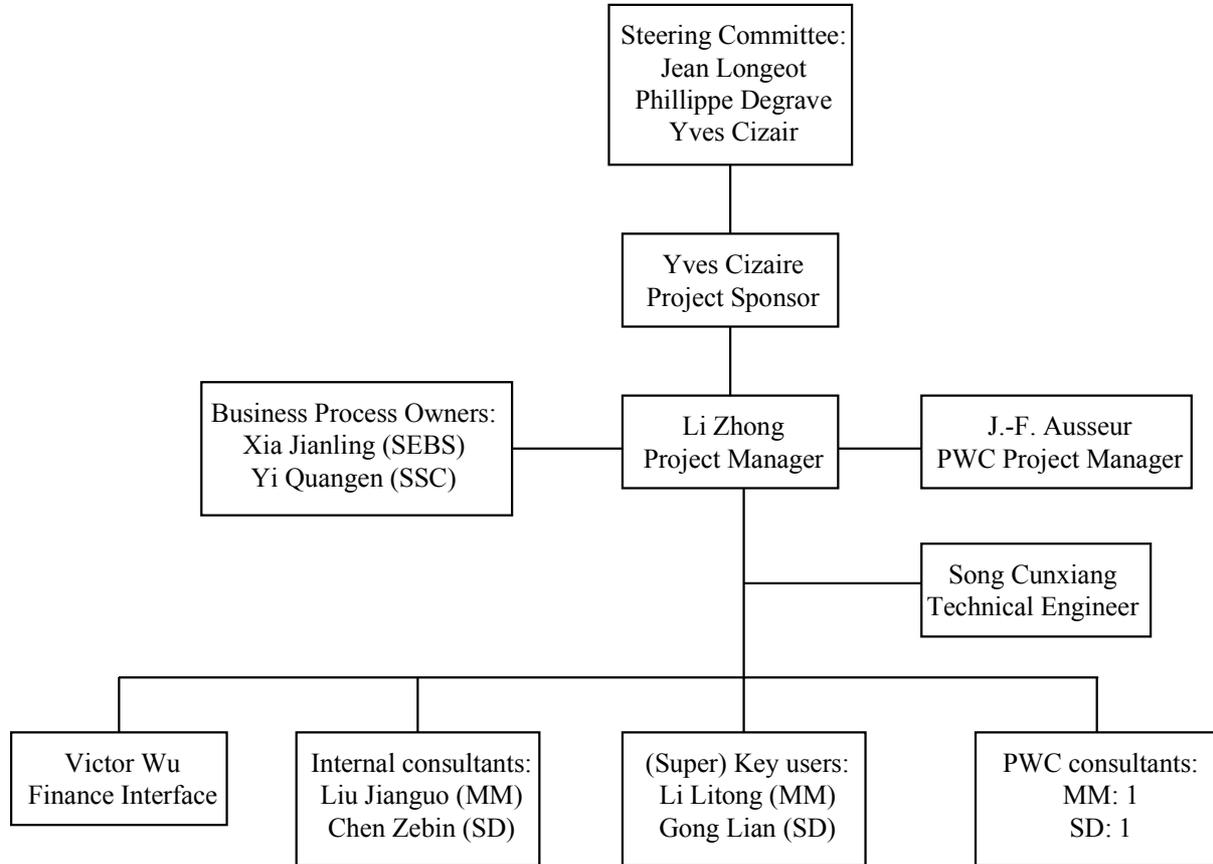
Phase I: FI/CO

- Customer Master, Vendor Master, G/L account
- Accounts Receivable
- Accounts Payable
- Fixed Assets
- Credit Management
- Internal controlling (costing, budget planning)
- A/P, A/R invoice interface for SDS
- HQ group information supply via interface with CIEL

Phase II: SD/MM

- Customer Master, Pricing, Material Master, Vendor Master
- Domestic and export order processing (order to cash) for sales and indent products
- Customer return, rebates payment
- Procurement for production and non-production materials
- Return to ventor
- BOM maintenance and MRP
- Cycle counting, scraping
- Inventory movement
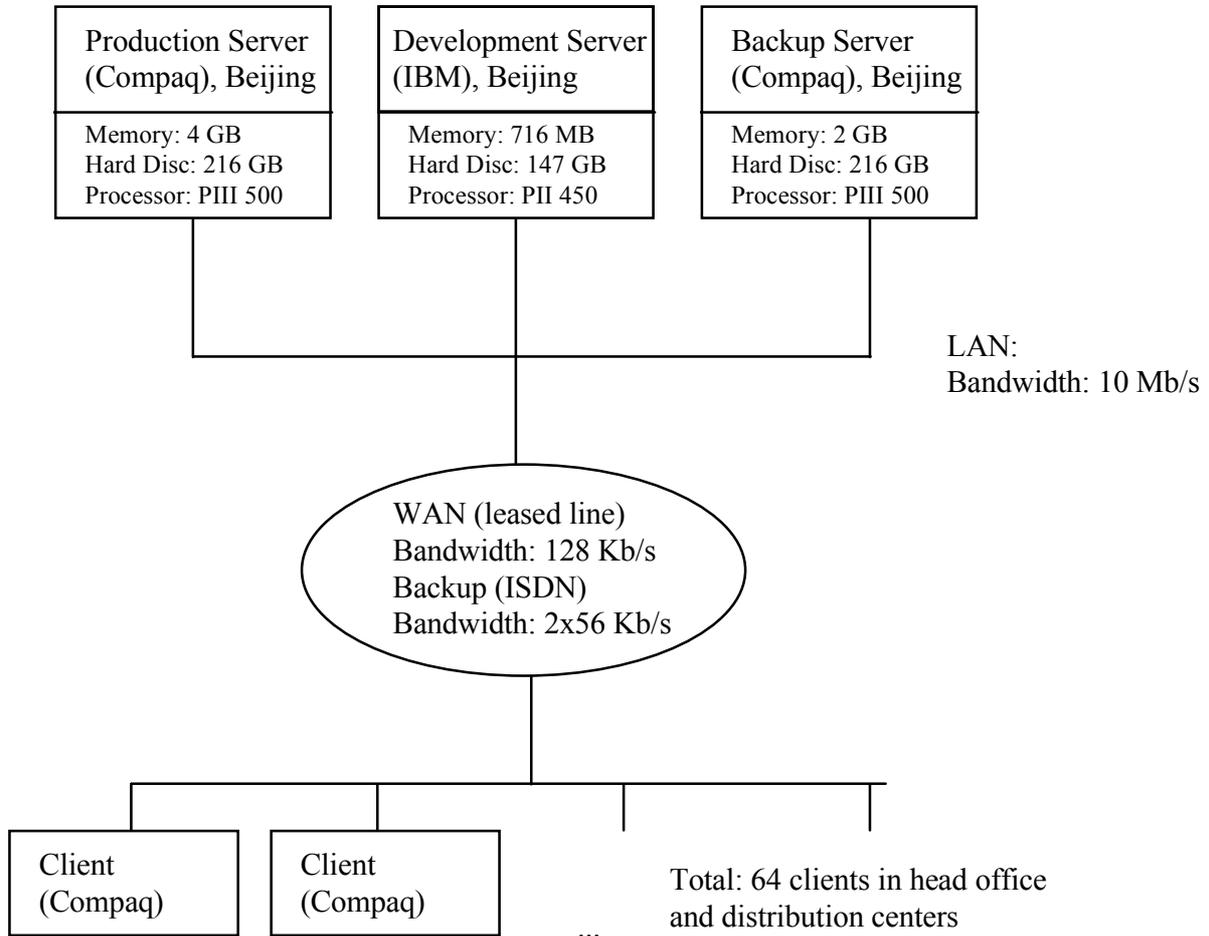- Transfers between plants

Source: Schneider Electric China

Exhibit 12: The structure of the project team

Source: Schneider Electric China

Exhibit 13: ERP technical infrastructure in 1999

Production Server (Compaq), Beijing	Development Server (IBM), Beijing	Backup Server (Compaq), Beijing
Memory: 4 GB Hard Disc: 216 GB Processor: PIII 500	Memory: 716 MB Hard Disc: 147 GB Processor: PII 450	Memory: 2 GB Hard Disc: 216 GB Processor: PIII 500

LAN:
Bandwidth: 10 Mb/s

WAN (leased line)
Bandwidth: 128 Kb/s
Backup (ISDN)
Bandwidth: 2x56 Kb/s

Client (Compaq)	Client (Compaq)	...

Total: 64 clients in head office
and distribution centers

MB: Mega Bytes
KB: Kilo Bytes
Mb/s: Mega bits per second
Kb/s: Kilo bits per second

Source: Schneider Electric China

Exhibit 14: Excerpt describing the process of configuring R/3

Everything is driven by the business process. The first thing is to identify the flow of information and then, once you agree upon the flow of information, some big decomposition of the business process [is done] … then you move transaction by transaction following the order of the business process; let's say if you think about a process like order to cash, you will start with the order creation. You sit down with your customer and try to go through the order creation, the different screens, try to check how the person will enter the sales order, which field should be mandatory, which fields should not and that will drive the configuration behind … once you do that, what we call proto-typing or scripting, you script the transaction, and at the end of this exercise you have your business flow documented … which means that you could almost at this point start the system and really envision how you will create a sales order in the system once you are live. On SAP, you have what they call the reference model which shows you the different transactions per modules … You have the SD module on the user side and you have the SD module on the configuration side and then you can use that as a check list.

Source: Interview with J.-F. Ausseur, PwC senior consultant

Exhibit 15: ERP implementation phases as prescribed by the SAP implementation methodology (ASAP: Accelerated SAP)

1. Project Preparation
   - Ensuring support by all decision makers
   - Building the team of internal and external consultants and users
   - Training of project team members
   - Defining of project scope ("scoping")
2. Business Blueprint
   - Documenting the company's business requirements
   - Set-up of the test system
3. Realization
   - Customization/configuration of the system
   - Fine-tuning
4. Final Preparation
   - Training of end users
   - System testing
   - Data conversion
5. Go Live and Support
   - Adaptation
   - Upgrades

Source: SAP