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Building server capabilities in China

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Abstract

The purpose of this paper is to further our understanding of multinational companies building server capabilities in China. The paper is based on the cases of two western companies with operations in China. The findings highlight a number of common patterns in the 1) managerial challenges related to the development of server capabilities at offshore sites, and 2) means of how these challenges can be handled.

Keywords: Server capabilities, offshore factories, China.

Introduction

Many western multinationals have defined China as their second home market. This poses a range of new demands which, considering numerous examples of failures, are not always easy to meet. The key definitions and literature sources directly connected with transition processes in emerging economies, such as China, are established and existing literatures have also focused on the characteristics of the entering firm, in particular its resources and capabilities (Barney, 1991; Anand and Delios, 2002) and its need to minimize transaction costs (Buckley and Casson, 1976; Anderson and Gatignon, 1986; Hill, Hwang, and Kim, 1990). While resources and capabilities are certainly important (Peng, 2001), recent work has hardly considered the market orientation of offshored sites and, especially, the transformation from a low-cost based offshore factory to a more market-oriented server factory.

This transformation demands new operational configurations, proper management of existing capabilities and building of new capabilities so as to cater for arising challenges and achieve desired operations. The relationship between the server factory and the home plant is the key area of concern in this paper. Before the change of role from offshore to server factory, the production function in the offshore factory relates and communicates with the production and related functions back home. The transfer of, for example, R&D activities to an offshore factory, extends the set of relationships to other departments such as R&D and marketing. Thus, the transition from a low-cost plant to a server factory increases the pattern of relationships between “mother and child” and, in effect, the complexity of the coordination between the two sites.

In addition, the offshore plant needs to develop a range of capabilities needed to perform its new role effectively, for example the capabilities to handle customer enquiries, configure customized product solutions to serve the market, provide technical clarifications and support to sales companies/customers, give data support to adapt products to market requirements, update product and manufacturing documentation for

workflow systems/documentation in order to make tacit knowledge explicit, and perform quality tests. The purpose of this paper is to develop a number of propositions assisting managers in building these server capabilities and furthering our understanding of capability transformation.

The next section introduces the theoretical background of the study. Following a description of the research design, the two case studies performed for the purpose of the study are presented. Based on a discussion of the main findings, a number of propositions on the development of server capabilities are suggested. A discussion of the limitations of the study and directions for further research concludes the paper.

Theoretical background

Studies contributing to understanding international operations can be found partly in the international business (IB) literature and partly in the domain of operations management (OM). The IB literature represents a well-established understanding of the internationalization process, and its drivers and motives. Initially, the reasoning for establishing international operations was examined mostly from the perspective of foreign direct investment (FDI). Some classic contributions find that in the 1970s many U.S. firms directed their FDI to developing countries in order to capitalize on the low labor costs in these countries (e.g. Moxon, 1975) or play off currency fluctuations (Leff, 1974). Later research identified factors such as entering new markets, market proximity, and access to natural and/or intellectual resources. The OM literature has generally been more concerned with the effectuation and capabilities of international operations.

Strategic motives affect the role the offshore sites are given. A typology of plant roles was proposed by Ferdows (1997), and tested (and largely supported) by Vereecke and van Dierdonck (2002). One of Ferdows' (1997) types, the offshore factory, is established to produce specific, usually low-cost, items, which are then exported either for further work or sale. Investments in technical and managerial resources are kept at a minimum. Little development or engineering occurs at the site and local managers rarely choose key suppliers or negotiate prices. In contrast, a server factory (Ferdows, 1997) is a production site that supplies specific national or regional markets. It typically provides a way to overcome tariff barriers and reduce taxes, logistics costs, or exposure to exchange rate fluctuations. It has more autonomy than an offshore factory to make modifications in products and production methods to fit local conditions, although its authority and competence in this area are limited.

Vereecke and van Dierdonck (2002) explain that offshore sites with market and skills/know-how proximity as the primary drivers play a higher strategic role than offshore sites with low labor cost as the primary driver. The pressure to reduce time-to-market, increase customer service, or adapt products to local tastes, for example, may stimulate local management to develop the local competence base and increase its server capabilities by shifting focus from low labor cost to market serving capabilities.

Capabilities represent a firm's ability to deploy its resources so as to achieve specific results. Various scholars (e.g. Schreyogg and Kliesch-Eberl, 2007; Teece et al., 1997; Winter, 2000) suggest that capabilities are the result of collective learning processes, present a combination of unique technologies and skills, and are embedded in the organization and its procedures. Sustainable success depends not only on a company's operational capability to design, produce and deliver a wide range of low cost, high quality products rapidly and reliably (Boer, 1991) but also on its strategic and adaptive capability to adopt and/or develop, and implement, the products/services, processes and process technologies, management systems and forms of organization fitting to its future situation. Today it is generally accepted, both in academia and in industry, that

these capabilities require organizations to formulate and implement consistent, strategy-driven decisions on manufacturing (Hayes and Wheelwright, 1984).

Whereas there are many publications identifying drivers for offshoring and describing different types or maturity levels of offshore plants, little is known about the process such sites go through, from low cost-driven to market-oriented. The central question in this paper therefore is: *how do foreign firms build the capability to adapt their operations in China so as to get beyond low cost, serving home base requirements to serving local market conditions?*

Methodology

A qualitative approach, i.e. case studies of two western industrial companies, is adopted in this study. One of several strategies of qualitative enquiry, case studies are well equipped instrumentally for furthering understanding of particular issues or concepts which have not been deeply investigated so far (Eisenhardt 1989; Voss et al. 2002; Yin 2009). Consistent with the exploratory nature of the present study, propositions for further research will be developed.

The problems related to getting access to reliable archival data and conducting questionnaire-based surveys in emerging, as compared to developed, economies are well-known (Estrin and Wright, 1999; Hoskisson et al., 2000; Tan and Peng, 2003). Hence, we conducted case studies of two western industrial companies. Achieving a higher degree of certainty about the propositions of the study played a role in deciding the number of cases and the key criteria for the selection of the cases: the case companies should have 1) industrial products, 2) operations in China, and 3) achieved a good level of maturity in their globalization process.

Empirical data were collected between March 2011 and March 2012, using a three-step approach. First, secondary sources, such as annual reports, press releases, media materials, were analyzed to provide the researchers with an overview of the companies and their global operations. Second, as our objective was to generate in-depth insight, we conducted semi-structured interviews, which allowed us to obtain facts and opinions about, as well as insights into, phenomena from first-hand sources (Yin, 2009). Before the interviews, protocols were developed in order to enhance the reliability and validity of the case study data (Yin, 2009; Voss et al., 2002). See Appendix for an overview of the topics addressed in the interviews – similar topics guided the analysis of the secondary sources mentioned above. The interviews typically lasted a quarter of an hour to 2 hours. They were digitally audio-recorded and, afterwards, transcribed immediately. This approach was both to maximize recall and to facilitate follow-up and filling of gaps in the data (Voss et al., 2002). Finally, combining document reviews and data transcriptions, case reports were written and returned to the companies for verification. After several rounds to and fro, the case reports were finalized.

Data analysis was carried out parallel with data collection, which allowed us to take advantage of flexible data collection, making relevant adjustments along the way (Eisenhardt, 1989) and creating an iterative process between interviews, literature reviews and analysis. Data analysis in this study followed the approach of transcription; identifying a thematic framework; identifying themes, mapping and interpretation.

The research relied extensively on triangulation (McCutcheon and Meredith, 1993): the use and combination of different methods (document surveys, interviews, on-site observations) to study the same phenomenon provides stronger substantiation of constructs and enhances the validity and reliability of the data collected (Eisenhardt, 1989). An analysis of the case narratives, including in particular a confrontation of the

cases with existing literature, produced propositions on the development of server capabilities, including the challenges related to that as well as possible solutions.

Case Studies

Case A

The company is a western MNE working in the industrial equipment sector. Its strategy to penetrate emerging economies has led to significant changes in the organization. Before the year 2000, all operations (R&D, Sales and Support functions) were located in Germany. R&D skills were the main competence of the German site. In order to take advantage of low cost labor, two other factories were built in Slovenia and Slovakia for production. There was no sales operation in Slovenia and Slovakia; all the sales were focused on the Chinese market, where the company sold a major part of its products and solutions through its sales offices and another big brand group. In 2008 the company decided to move production and product development to China in order to provide better support for the local market and to avoid fluctuations in exchange rates. This meant that an entirely new capability would have to be built in China. Skilled R&D staff from Germany was used to train the employees in China. Gradually, the German site was downsized and eventually lost its functions and, with that, a lot of knowledge.

The case company already sold its products for light commercial and mobile applications in China. To serve the Chinese market better, the company expanded its business focus by introducing its most recent household applications. Based on a new platform, the new series of household products were a significant upgrade to a range that covers the entire field of household appliances. Being 50% more silent than comparable products, the new series offers a substantial advantage in applications that rely on low noise operation. The product was adapted for low noise operation through its layout and installation coupled with additional pressure mufflers. In today's global competition, manufacturers of industrial equipment are also constantly looking for ways to improve the energy efficiency of their products with the smallest possible investment. By utilizing the efficiency of the products, the manufacturers of household appliances can save considerable R&D and production resources when optimization was needed. Furthermore, the products were available in an extra robust version for tropical adaptation, which is perfectly suited for markets (e.g. China) with high ambient temperatures and/or unstable power supplies. The company products also have quality (ISO 14001 and 9001) standardization.

To balance the risk of production, the company built two plants in China. Most of the operations are outsourced (about 80%) in order to cater for the lack of technical competencies in the China office. The ratio between outsourced units and in-house production in the product have increased from 50/50 in the early 2000 to approximately 80/20 in 2011, requiring an augmented set of skills from purchasing to supply development.

Case B

The company is one of the world's leading industrial equipment manufacturers. The company started in China with a small representative office in 1994. It later grew to have sales offices in each region of China to support its customers. The sales offices are managed by Chinese recruits because it is difficult for expatriates to sustain customer relationships in China due to language barriers. The company moved production to China in 1997 in order to be present in a market that represents 25% of the company's global sales, grows 21% per year and will in 2025 have the same buying power as the US (USD 300Million). Establishing operations in China brought with it the need to

establish R&D there, too, to support global product development and to develop local products. However, the company's R&D was set up in China by employees without formal training or experience in R&D. Therefore, it took a lot of time to build the competence suitable for local operations.

The Chinese market for industrial equipment is strategically divided into three levels. Level A concerns strategic products that are sold to environmental treatment plants, governmental and world financed projects. It is important to know that 70-80% of sales in China are project related (e.g. building services) because selling through the industrial sector is slow. Level B is where the company competes with local brands under another name which cannot be traced to it. The purpose is to prevent the local competitors from graduating into level A where the company is having a strong competitive edge. Competing on level B also gives the case company the opportunity to develop new product variants with local customers to achieve performance levels that no other company could promise. However, it is interesting to know that the local Chinese companies have started to compete with the international companies at this level using product price as the main competitive criterion. Targeting local customers, level C is where the company competes under an entirely different name as well, with lower-quality products, which cannot be traced to it. These products are adapted to local customers' requirement in order to aid these customer's business.

In order to adapt to local market conditions, the case company also gives aftersales licenses to some accredited companies to coordinate their services. It has likewise reduced the number of its dealerships by upgrading some of the previous dealers to licensed dealers. Those upgraded as licensed dealers are the dealers who are big enough in terms of annual turnover or those that have shown a steady growth in their business with a close relationship with the case company. In offshoring to China, the case company has discovered three fundamental challenges: 1) the need to speed up product development because the original three to four years lead time from business case to market launch was too long in the local market; 2) finding and retaining the right people to learn and understand the local needs; and 3) lack of international insight of local recruits. To address these three challenges, skilled local recruits are hired and deployed abroad for some period in order to acquire standardized skills and to adopt them on return. Service support employees are also recruited and located close to regional sales offices to provide customers with required services. Facilities or laboratories to encourage product testing and quality are also built.

Discussion

The case companies represent the industrial equipment industry but differ in terms of parameters such as size, product and customer focus. Notwithstanding, we can detect some similarities, which are proposed as a set of principles, processes and solutions that can guide a manufacturer in overcoming the challenges related to, and successfully manage, the transition process from an offshore factory to a server factory in China. The analysis of companies involved in this study reveals that they were configured on an international basis and consisted of decentralized and nationally self-sufficient subsidiaries, which related actively in an exchange of skills, services and information. Although the journey towards self-sufficiency is yet to be fully realized, such a multinational mode of organizing operations seems to depend on some factors. First, the foreign direct investment (FDI) perspective of establishing international operations. Second, benefits of offshoring, for example, low cost manufacturing (low cost energy, low cost raw materials, and low cost labor), access to new knowledge and access to local markets stimulate manufacturers in China to use overseas resources both internally

and externally, for standardized tasks and to gradually upgrade themselves to become a server factory. Third, a fast-growing market reinforces the drive towards market-oriented production. Table 1 shows that server capabilities are built and used differently. We suggest the following propositions on the capability transformation of the cases:

Proposition 1a: Creating an appropriate mandate and safe environment to experiment with company equipment allows the development of reliable and quality products.

Proposition 1b: Recruiting skilled local labor with engineering capabilities to explore and exploit the market aids the building of product adaptation capabilities to local conditions (understanding local market demands).

Establishing an R&D function alongside the production in China and the presence of a rich supply of skilled engineers in China (Sun et al., 2007) provide the possibility to co-develop products to serve the Chinese market. A crucial element in adapting to market-oriented production by building server capability is the deployment of experienced R&D workers to China from headquarters so as to transfer key skills acquired by experience, avoid its dearth in case of the experienced worker resignation, and advance the skills of the local recruits (Case A). Case B facilitated learning/ acquisition of skills by opening a R&D office in China, which provided new knowledge to the headquarter about the Chinese market and, acting as a center of excellence, partnered with headquarters in building strategic capabilities for emerging market operations (Vereecke and van Dierdonck, 2002).

According to Vereecke and van Dierdonck (2002), adapting products to local needs stimulates market-building capabilities. This is reflected through the recruitment of highly skilled workers with engineering skills in both case A and B. Product adaptation to market demands enhances cooperation with customer towards fostering business interdependently (case B). Both cases developed the sourcing capabilities of their suppliers by increasing their skills and maintaining a close relationship with them, enabling partnerships.

Proposition 2: Sourcing capabilities are developed by maintaining close supplier relationships (market knowledge and specialized skills acquisition) and reducing the number of outsourced operations.

Both case A and B support the importance of new products brand and variants, corresponding to minor modifications in products and production methods to fit China conditions (Ferdows, 1997). Case A adopted this method so as to diversify its business and render value to particular customers; case B as a competitive weapon to have advantage over competing companies in the same business category/level.

Proposition 3: New Products Introduction (NPI) capabilities are built through continuous interaction between home-based factories and customers and/or after sales services in China.

Both case companies have physical facilities in China in order to avoid fluctuations due to foreign exchange, logistics costs and to serve the Chinese markets (Ferdows, 1997; Leff, 1974).

Proposition 4: Although globalization allows operations to be virtual, physical presence of production facilities better reveals and addresses the dynamics in the host market.

Table 1 – How server capabilities are used in the case companies

Server capabilities	Purpose of the server capability	Feedback/suggestions to customers, other functions	Found in
Supplier development	Providing technical and related consulting to suppliers and helping them to improve	Documents, experience and knowledge for helping suppliers to improve	Case A and B
Production facility in China	Bureaucratic reasons To be close to customers in order to facilitate transactions/avoid foreign exchange fluctuations To retain/improve global sales	To balance the risk of production Information on how to reach customers	Case A and B
Rapid/reliable delivery of products to customers	To serve the local markets efficiently	Sales offices in all regions Opportunities for socialization and collaboration Companies with strong social resources often succeed Generation of new ideas for future advancement	Case B
Technical know-how/highly qualified workers	To provide technical and product benefit information to customers To cater for lack of required skills	To provide required services and to ascertain customers specifications	Case B
Environmental adaptation of products/cooperation with customers	To make product useable in the market served	Reliability of products in local markets	Case A and B
New product brands and variants development	To customize products according to different users	New products matching customers' demands Regional variation does not affect product adaptation	Case A and B
New business diversifications (e.g. district heating)	Platform to develop new ideas	Opportunity to turn knowledge and idea into products	Case B
Specialized skills for product testing	To ascertain product quality before leaving the company	Purchasing agreement with clear product status	Case B
Outsourcing cooperation	To augment lack of skills Customer-specific service to ascertain higher customer satisfaction	The core competency should be retained in-house, only a fair percentage of operations should be outsourced	Case A
Fast service or technical support to customers	To provide technical and product related support to customers	Support workers close to sales regional offices to provide required services	Case A and B

Cases A and B gave insight into the responsiveness of the companies to provide prompt technical support to customers as a result of their embeddedness in all regions of the national market served. So, we argue that to build server capabilities in China, it is important for product service support centers to be present in all relevant regions in China to attend to local customers' needs. More communication between customers, product service support and other relevant functions should be encouraged as well.

Proposition5: Establishing service centers focused on the Chinese market helps rapidly developing the business and building customer relations.

Furthermore, supply capabilities are built taking charge of sales, delivery, customer relations etc. Inter-functional coordination, from a single strategic demand to a wider range of different demands aids the ability to serve the market efficiently because the operations function is no longer isolated but embedded in the organizational network. Hence, office support employees are recruited to process and direct enquiries/information to appropriate functions and to act as the inter-link across functions.

Conclusions, limitations and further research

The study attempts to bridge the gaps identified in the existing literature by reflecting not only on the capabilities of offshore sites but how they build capabilities going beyond those needed for low-cost production. The case studies performed for that purpose reflect challenges for offshore plants to develop themselves to market-oriented server factories, a shift from cost orientation with the production of low cost components that are transported for assembly back home, to a situation in which products are produced completely in China to serve the Chinese customers. On the basis of the cross-case analysis we identify common patterns with regards to realized product brands/variants, business diversification, product specifications and process optimization.

As the study is ongoing, the conclusions reached at this stage are tentative. Furthermore, the study suffers from the usual limitations associated with the use of qualitative methodology. While it aims to provide an essential platform, further, larger-scale, research will be needed to test the propositions. Thus, the principal contribution of this paper is propositions and principles that capture companies' absorption and adaptation of strategies to build market server capabilities in China. The findings are tentative guides on how companies can maximize the benefits of their server factories, and add to the theory on upgrading offshore factories to server factories in China.

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References

- Anand, J. and Delios, A. (2002), "Absolute and relative resources as determinants of international acquisitions", *Strategic Management Journal*, Vol. 23, No. 2, pp. 119-134.
- Anderson, E. and Gatignon, H. (1986), "Modes of foreign entry: a transaction cost analysis and propositions", *Journal of International Business Studies*, Vol. 17, No. 4, pp. 1-26.
- Barney, J. (1991), "Firm resources and sustained competitive advantage", *Journal of Management*, Vol. 17, pp. 99-120.
- Boer, H. (1991), *Organising Innovative Manufacturing Systems*, Gower, Aldershot.
- Buckley, P. and Casson, M. (1976), *The Future of the Multinational Enterprise*, Macmillan, London.
- Eisenhardt, K.M. (1989), "Building Theories from Case Study Research", *The Academy of Management Review*, Vol. 14, No. 4, pp. 532-550.

- Estrin, S. and Wright, M. (1999), "Corporate governance in the former Soviet Union: an overview", *Journal of Comparative Economics*, Vol. 27, pp. 398-421.
- Ferdows, K., (1997), "Making the most of foreign factories", *Harvard Business Review*. March-April, 73-88.
- Hayes, R.H. and Wheelwright, S.G. (1984), *Restoring Our Competitive Edge*, John Wiley & Sons, New York.
- Hill, C., Hwang, P., and Kim, W. (1990), "An eclectic theory of international market entry mode", *Strategic Management Journal*, Vol. 11, No.2, pp. 117-128.
- Hoskisson, R., Eden, L., Lau, C-M. and Wright, M. (2000), "Strategy in emerging economies", *Academy of Management Journal*, Vol. 43, pp. 249-67.
- Jensen, M. and W. Meckling (1976), "Theory of the firm: managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, Vol. 3, pp. 305-360.
- Leff, N.H. (1974), "International Sourcing Strategy", *Columbia Journal of World Business*, Vol. 9, No. 3, pp. 71-79.
- McCutcheon, D. M. and Meredith, J.R. (1993), "Conducting case study research in operations management", *Journal of Operations Management*, Vol. 11, No. 3, pp. 239-256.
- Moxon, R.W. (1975), "The motivation for investment in offshore plants: the case of the U.S. electronics industry", *Journal of International Business Studies*, Vol. 6, No. 1, pp. 51-66.
- Peng, M. (2001), "The resource-based view and international business", *Journal of Management*, Vol. 27, pp. 803-829.
- Schreyogg, G. and Kliesch-Eberl, M. (2007), "How dynamic can organizational capabilities be? Towards a dual-process model of capability dynamization", *Strategic Management Journal*, Vol. 28, pp. 913-933.
- Tan, J. and Peng, M. W. (2003), "Organizational slack and firm performance during economic transitions: two studies from an emerging economy", *Strategic Management Journal*, Vol. 24, pp. 1249-1263.
- Teece, D.J., Pisano, G. and Shuen, A. (1997), "Dynamic capabilities and strategic management", *Strategic Management Journal*, Vol. 18, No. 7, pp. 509-533.
- Vereecke, A. and Van Dierdonck, R. (2002), "The strategic role of the plant: testing Ferdows's model", *International Journal of Operations & Production Management*, Vol. 22, No. 5, pp. 492-514.
- Voss, C., et al. (2002) "Case research in operations management", *International Journal of Operations & Production Management*, Vol. 22, No. 2, pp. 195-219.
- Winter, S.G. (2000), "The satisficing principle in capability learning", *Strategic Management Journal*, Vol. 21, pp. 981-996.
- Sun Y., Von Zedtwitz, M. and Simon, D.F. (2007): "Globalization of R&D and China: an introduction", *Asia Pacific Business Review*, Vol. 13, No. 3, pp. 311-319.
- Yin, R. K. (2009), *Case Study Research: Design and Methods*. Sage Publications, USA.

Appendix

Interview questions

- What was your motive for setting up production in China?
- Why is China defined as your second home market?
- Do you foresee the server company independency from the home base?
- How do you source ?
- Why do you source as you do?
- What are the strategies behind sourcing?
- How do you interact with suppliers?
- How do we continuously influence our suppliers to develop some unique requirements?
- Do you think outsourcing will be a lasting strategy?
- What is your key initiative on the shop floor?
- What are capabilities?
- How do we build server capabilities?
- How does the server company relate to home base across functions?
- What are the purposes of service centers?
- Why are R&D facilities located in proximity to manufacturing activities?
- How are new products introduced?
- How coordinated is the link and communication between server companies and home base?
- Are the server companies independent or dependent on home base?
- What skills are needed to adapt products to market situations?