

## **Global Innovation – Lessons Learned from the Novo Nordisk Case**

**Nina BIRKMOSE, Ruxandra POPOVICI**

*ruxandra.popovici@gmail.com*

*Copenhagen Business School*

### **Abstract**

*This paper looks at the possibilities of Western multinationals to efficiently and effectively relocate research and development to emerging markets. In order to exemplify the findings, we will use the case of Danish pharmaceutical company Novo Nordisk and their approach to the Chinese market. Thus, the research question of this paper is: Which lessons are to be learned from the case of Novo Nordisk in China?*

**Keywords:** global strategy, foreign market entry, offshoring, R&D, pharmaceuticals

**JEL Classification:** F21, F23

### **1. Introduction and Method**

The forces of globalization are continuously changing the business landscape. Outsourcing and offshoring have been used by multinationals for decades. Global value chains stretch across the world and incorporate a diverse range of people and cultures. With this type of internationalization, new challenges arise. Each company must find a business model that fits their needs and adds the most value to their operations.

The traditional outlook on offshoring is keeping research and development close to headquarters and assembling abroad. China's rise is partially based on it becoming "the world's workshop": numerous companies moved their production there in order to take advantage of the cheap labour offered.

However, a general attitude shift seems to occur when it comes to manufacturing in China. Wages have risen by 69% between 2005 and 2010 and it is estimated that by 2015, the US and China will be just as attractive for manufacturing. (The Economist, 2011) There is an increasing need to manufacture close to the place of consumption.

Therefore, China's role is undergoing a radical transformation. Still, its relevance is not dwindling. With its population of 1.3 billion and its rising middle class, China is an enormous market. Companies will still manufacture in China, for Chinese consumption. Downstream activities are already undertaken locally. However, we are witnessing an increasing number of upstream activities taking place here, such as research and development.

The information for this research was obtained from desktop research. Novo Nordisk published the "Blueprint for Change" report on its operations in China and their value in February 2011. This report, along with other sources on the company, has been the basis for the research. In order to shed light on the operations of Novo Nordisk and gain insight into the lessons learned from the case, theories on entry strategy, global innovation and culture have been applied.

## 2. Case study

### **Novo Nordisk**

Novo Nordisk is a Danish pharmaceutical company. It has production facilities in seven countries and affiliates in 74 countries. As of March 2011, Novo Nordisk employs 31,300 persons in: Denmark (13,707), North America (4,731), Europe (4,309), China (3,663), Japan and Korea (988), other international operations (3,946). 18% of the employees work in research and development.

The main product areas of Novo Nordisk are diabetes care, haemostasis management, growth hormone therapy and hormone replacement therapy. In the first trimester of 2011, diabetes care amounted to sales of 11, 808 million Danish kroner, 1,376 million of which occurred in China.

### **Danish Involvement in China**

“The rise of the Asian giants fundamentally changes the strategic landscape for MNCs” (Hansen et al. 2010:11). The financial crisis hit many countries hard, but even though China has been affected as well, it has continued to show remarkable growth rates and it is expected that it will have a stronger position vis-à-vis other countries after the crisis (Hansen et al. 2010). The economic development and democratization witnessed in China has had a major impact on MNCs global strategies, as many cannot ignore the vast market opportunities it represents. Additionally, China’s industrial development has affected the global competition, putting pressure on global players (ibid.).

Danish industry has been present in China for centuries, however; the following recent trends have affected the acceleration of the Danish involvement in China:

- Liberalization of requirements for foreign investors
- The establishment of Special Economic Zones (SEZ)
- Large reductions in tariffs
- Investments in infrastructure
- Rapidly growing purchasing power (Hansen et al. 2010:13)

Thus, recent development both on a global level and in China has increased and diversified the Danish involvement in China. In order to understand the operations of the companies, we shall now look upon the concept of global strategy.

### **Novo Nordisk in China**

Novo Nordisk products have been present in China since 1962. In 1994, an affiliate was established and a long-term strategy for diabetes in China was crafted. The first production facility was opened in 1995 in Tianjin – a packaging site. In 2002, Novo Nordisk opened a research and development centre in China, the first pharmaceutical company to do so. In 2003, the company began transferring the production of their NovoPen 3, an insulin device, to Tianjin. By 2009, NovoPen 3 and its successor, NovoPen 4, were entirely produced in China.

In 2008, Novo Nordisk began constructing a new plant that will produce insulin filling in Tianjin. The company estimates that the plant will start production in 2012. By 2015,

Novo Nordisk expects to have built the entire facility range in order to serve the Chinese market.

Novo Nordisk products had been present on the Chinese market for 32 years, when the company opened an affiliate named Novo Nordisk Biotech in Beijing in 1994. One year later, the first production facility opened in Tianjin. In 2002, the research and development centre also opened in Beijing.

According to BBC, China has recently become the world capital of diabetes, thus displacing India as the holder of such a questionable distinction. As of 2010, 92 million or 10% of adult Chinese suffer from diabetes, while an additional 150 million show early symptoms. Many cases remain undiagnosed. These numbers are caused by shifts in lifestyle, which are influenced by urbanization, a sedentary lifestyle and more income available for food purchases.

The segment affected by diabetes is different from the one in the Western world. In the West, patients tend to be aged 60 to 79 and overweight. In China, people get diabetes between 20 and 59 and are not necessarily facing weight issues. These findings extend to other Asian countries that experience accelerated growth, such as India, Vietnam and the Philippines.

Novo Nordisk plans to tackle diabetes in China on several fronts. Due to the complexities of the disease, a combination of measures is necessary. On the one hand, physicians need to be engaged and informed about medicine. On the other hand, patients have to be informed about diabetes management. According to the company's website, a holistic strategy is required – one that focuses on “physician training, patient education, strengthening the healthcare system, public awareness, local production and R&D” (Novo Nordisk, May 2011.)

Novo Nordisk engaged the World Diabetes Forum and the Chinese Ministry of Health to create the National Diabetes Program, which consisted of several private-public partnerships focused on health system integration and educating both physicians and patients.

The approach used with medical staff focused on “prevention, screening, optimizing treatment and patient communication” (Novo Nordisk website, May 2011). Around 55,000 doctors participated in a series of seminars and conferences with leading diabetes researchers around the world. The participants ranked the training as very important in improving the relation with their diabetes patients.

Novo Nordisk estimates that its programs reached and educated around 280,000 patients since 1997. Such programs include the NovoCare hotline, which connects patients with diabetes management specialists, or The Changing Diabetes Bus, which provides mobile education to various communities. Patient education increases sales by DKK 3,400 per patient.

Finally, local production and R&D has given the company greater flexibility and a quicker response time. Novo Nordisk uses a range of suppliers from China (Tianjin and Shenzhen) and from Thailand, which adds to the benefit of producing in this region.

China is currently the third biggest market for Novo Nordisk. In 2010, their market share was 63%. In addition, Novo Nordisk created 14,600 jobs, directly and indirectly. The direct jobs are in the sectors of R&D, production, sales and education (Blueprint for Change). Novo Nordisk's integrated program made it the top-ranked pharmaceutical company, for both doctors and patients. What are the lessons learned and what is next?

### 3. Literature Review

This literature review will commence by providing an overview of the concept of global strategy. Subsequently, the entry strategy shall be looked into. This shall be followed by a discussion on approaches to innovation and finally, the challenges in regards to operations in developing countries shall be examined, including inter-cultural human resource management.

#### **Global Strategy**

Lasserre (2007) states that a global business strategy is defined as a company's plan for achieving its long-term goals, and suggests a framework consisting of four components. The first component is a global strategic ambition, i.e. the company's view on its future objectives in the world. Secondly, the global strategic positioning, which can be divided into decisions regarding which countries are important for the company and how and which value propositions are relevant. The third component is the global business system and deals with the value chain of the company. Important in relation to this third component is the company's choices in regards to how the value chain is integrated around the world. The last component is the global organization. This is crucial for the global company as it entails the organizational design, which is meant to support the achievement of the three abovementioned components and thus, the objectives of the company.

The global strategy components are general terms, which should be put into a context and for the purpose of this paper we shall look into three specific areas; namely the entry strategy, the concept of innovation, and finally the challenges to human resource management.

#### **Entry Strategy**

The decisions in regards to entry strategy can be framed by three seemingly simple questions; i.e. where, when and how. Despite how simple and innocent these three words appear, the questions of entry strategy are of crucial importance in regards to a company's global strategy. In addition, Lasserre has pointed out the necessity of being clear about the company's objectives in regards to the entry of the given country (2007:191).

In terms of motivations for entering a country, Lasserre (2007) has pointed to four options. The first is developing the market, the second, is related to the resources the country possesses, the third, has knowledge at the center, and the last has infrastructural and regional coordination advantages.

The question of when to enter is conditioned on several strategic choices, all with advantages and disadvantages. Being a first-mover in an emerging market can be highly advantageous as the competition grows with the development of the country and market (ibid.). In later stages, one has to consider how fierce the competition is and to what extent the market is mature. However, as a first-mover there can be disadvantages in terms of lacking infrastructure, immature market and the company will have to perform the ground work, which the followers can then take advantage from. If it is opted for the company to enter when the market is mature, an acquisition is typically the optimal approach (ibid.). This leads to the question of how to enter. However, we shall not go into great depths with the question of ownership in relation to entering a country, but it is crucial to understand that it represents a major importance in regards to entry strategy.

When entering a new country, this can be done in the form of acquisitions, which was recommended in the mature market, or by forming a partnership with local businesses. The decision depends on the conditions in the country, e.g. the governmental requirements, the time frame the company has, but also the capabilities within the company and how this country is expected to perform in terms of return on investments (ibid.).

### **Global Innovation**

Globalization has changed the context for business and its approaches. This is also the case with innovation. Vernon's Product Life Cycle model has been very influential and crucial for understanding innovation processes in the 1950s and 1960s (Lasserre 2007). This model illustrates how a new product (innovation) is invented in its country of origin and marketed there and subsequently in other industrialized countries. The next steps involve second-tier countries' subsidies receiving the formulas for the innovations and producing them for local markets. Lastly, the developing countries are receiving the products at a low cost as they are no longer new and innovative in the developed countries (Lasserre 2007:278). However, globalization has meant a change to the cycle and products are now typically released simultaneously around the world (Lasserre 2007). Research and development (R&D) and its processes no longer follow this sequential model.

Many global companies nowadays are thus using global R&D networks and many companies have R&D centers located outside their country of origin – China and India are popular choices (Lasserre 2007:279). The decentralization of R&D entails setting up centres in countries other than the origin country, which is typically motivated by proximity to the local market and access to skilled personnel. In addition, the benefits of this model include the access to local knowledge (including engineers, specialists etc.) and clusters and the integration of knowledge across company subsidiaries (Lasserre 2007). On the other hand, there are certain potential negative aspects, which Lasserre (2007) characterizes as critical mass constraints and critical communication constraints. The former refers to the dangers of spreading the research activities across too many sites, as there are great benefits to be had from collaboration among researchers. A possible solution to this is the creation of specialized "Centers of Excellence". The latter, critical communication constraints, emphasizes that knowledge is shared through communication, both formally and informally.

Stabell and Fjeldstad (1998) classify companies in value chains, value shops and value networks. Value chains essentially produce standard items in large numbers, in order to attain economies of scale. Value shops offer solutions to specific problems. Companies that fit this description are generally technology intensive. They do not profit from large volumes, but rather from proximity to the market. Finally, value networks are mostly companies that connect consumers and facilitate information exchange – telecom companies and such.

The transfer of knowledge and thus innovation is affected by both culture and human resource management. In the context of China, this emphasizes the importance of looking into the challenges in relation to developing countries/emerging markets.

### **Challenges to operations in developing countries and cultural differences**

Understanding that different challenges arise in regards to emerging markets such as China and incorporating the relevant consideration into the company's strategy is crucial. Emerging markets typically display high growth rates, as it is the case of China, which

represents a favourable opportunity (Hansen et al. 2010). Another favourable condition is the lower cost of labour and resources. However, the constraints should not be underestimated. In the context of the Novo Nordisk case, it is relevant to notice that the competition for skilled labour such as engineers can be very fierce (ibid.). Institutions, both formal and informal most likely differ from developed countries, e.g. in terms of the enforcement of intellectual property rights.

Managing human resources properly can lead to great advantages, but the cultural differences must be taken into account. Decisions of relevance here are those related to the corporate culture and to what extent this should be transferred to the subsidiaries and those in relation to the national culture and how this may affect the employees and working conditions.

Hofstede's dimensions in national culture are famous, and help understand some differences which companies are meeting in the context of intercultural management. The dimensions are:

- Power distance – the accepted power distribution in a culture, i.e. if a hierarchical approach is more common or an egalitarian view is more accepted
- Individualism – the extent to which the individual is emphasized rather than the collective or vice versa
- Uncertainty avoidance –deals with the concept of risks and how they are confronted and rewarded
- Masculinity –refers to the nature of the competitive behavior (Lasserre 2007:305).

Understanding and managing according to these assumptions, thus, may influence the effectiveness and efficiency of work and human resources. As an example, the power distance is relatively high in China and it is common to know one's superiors. In addition, the collective aspect is valued higher in China compared to Western countries, which value individualism.

## **4. Analysis**

### **Global strategy**

Novo Nordisk is a global player in the pharmaceutical industry. The company's vision relates to it being the world's leading diabetes care company while respecting the Triple Bottom Line principles. In order to achieve this goal, it is of the utmost importance to be present in China.

The shift in lifestyle that occurred in China was predictable in the light of the country's economic growth. Therefore, Novo Nordisk entered the Chinese market in order to gain an early mover advantage, even if China was going through unrest at the time (1994). Later, the facilities were extended to cover all the diabetes care range. In fact, China is a self-standing zone in the organization of Novo Nordisk, which underlines its importance to the company. Having a sizable market share in China means gaining a foothold in the rest of the region, seeing how diabetes is on the rise in Asia.

Currently, Novo Nordisk has operations centres in Denmark, China, the US and Brazil. Research and Development activities only take place in Denmark and in China. The company is organized in zones as follows: Europe, North America, China, Japan & Korea

and International Operations. 36% of its employees work in sales and marketing, 27% in production and production administration, 19% work in administration and 18% in R&D.

### **Novo Nordisk's entry in China**

Novo Nordisk chose to enter China as one of the first pharmaceutical companies, and thus took an early mover approach. In 1962 the first line is introduced in China, as indicated by the timeline presented in Table 1 below. Interesting to note is how it clearly shows that the commitment of Novo Nordisk accelerated from 1994. In 1995 Novo Nordisk's first production site was opened in Tianjin and subsequently a biopharmaceutical R&D centre was opened as its first in the country.

**Table 1. Timeline of Novo Nordisk's commitment to changing diabetes in China**

2012	- First batch of Penfill from Filling plant Tianjin
2011	- China independent region
2010	- Shared service centre
2009	- NovoPen® 4 manufactured in China only - 2nd Public-private partnership with Ministry of Health: Hospital community integrated diabetes education program co-funded by WDF and Novo Nordisk - Executive hospital managers MBA programme - Three research partnerships - Diabetes leadership forum 2009 China (Public affairs)
2008	- Chemical compound library licence to National centre for drug screening - Changing diabetes®, 60 Cities tour - Cornerstone set for DKK 4000 million filling plant
2007	- Partnership with Chinese Academy of Sciences a Research Foundation - Clinical development centre Beijing - DMDP - expanding diabetes care to smaller cities
2006	- Changing diabetes bus - Major expansion of Novo Nordisk Tianjin Plant - Complete transfer of NovoPen® 3
2005	- Health-Star search involves General public
2004	- Expansion of packing and warehousing
2003	- 1st Public private partnership with Ministry of Health: National diabetes program funded co-funded by World Diabetes Foundation and Novo Nordisk - Novo Nordisk Tianjin Plant: First NovoPen® 3 released
2002	- Novo Nordisk Diabetes Update for physicians - Inauguration of R&D centre, Beijing
2001	- NovoCare club education team - Launch of STAR diabetes training with Steno Diabetes Center
1995	- Opens Production facility, Tianjin
1994	- Novo Nordisk Biotech Co., Ltd, Beijing
1962	- Introduces the first line of products in China

Source: Novo Nordisk (2011): The Blueprint for Change Program.

The motivations for Novo Nordisk appear to be largely related to the increasing market in China and its importance (Blueprints for Change). A long-term and holistic approach is emphasized, which is supported by their development in terms of commitment in China. By 2010, Novo Nordisk had an impressive 63% market share in China, and the country represents its third biggest market (ibid.).

This success may be due to the first-mover advantage achieved by being present in China for decades and furthermore by Novo's recognition of the importance of local government collaboration (ibid.). In addition, the strategy of Novo Nordisk in China has been characterized by their supporting roles to their business, e.g. the training of pharmacists and awareness campaigns/patients' education programs. These training programs and consumer education have been essential – also due to Novo Nordisk being one of the first players in the Chinese market (Lasserre 2007), however, in this case the first-mover approach appears to have been beneficial.

### **Global Innovation**

The fine slicing of the value chain (Buckley and Ghauri, 2004) can be a risky procedure, given the increasing cost of transportation and general transfer costs. However, the pharmaceutical industry seems to be remarkably adept at this practice, partially because of the lengthy and complex research process. In fact, research and development is the area most prone to slicing. YaleGlobal Online counts as many as 18 steps that can be undertaken and thus outsourced during research. (YaleGlobal Online, May 2011)

Some of these steps are highly sensitive – genetics, phase 0 and phase 1 clinical trials, in addition to administrative steps such as regulatory measures. They are normally undertaken in the research centre pertaining to HQ. Others, such as IT-related matters, can be easily offshored to companies in traditional outsourcing nations. Medium-level processes can take place offshore, on the sites of subsidiaries or of affiliates.

While there are advantages to fine slicing, the coordination costs can be daunting. One must also take into account the degree to which information needs to be coded and communicated across sites and internalized within the company.

Vernon's product life cycle can be called into question when analyzing Novo Nordisk's case. The old model is being challenged, since emerging markets are no longer imitators, but innovators on their own. In this case, Novo Nordisk is not simply relocating the manufacturing of mature products in China, but moving research altogether. However, it is important to notice that it is still an advanced country company that runs the operations and not a local one. The benefits to the local economy are highly dependent on linkages, as are knowledge spillovers and the learning process.

Novo Nordisk's research centre is found in Beijing, where 60% of R&D facilities in China are located. (Zhou, 2004.) The company can thus take advantage of a research cluster and can integrate into a global R&D network. The advantages of such a situation are learning, access to low-cost and fine quality scientists and quicker responses. However, there are also disadvantages, such as critical mass constraints and communication constraints. In the case of China, it is perhaps premature to claim overcrowding of laboratories and research sites. Communication constraints can remain a problem; still, Novo Nordisk is aiming to integrate the Chinese zone, which means that the research centre in Beijing will connect primarily to the plant in Tianjin.

While the company as a whole can be described as a value chain, its intensive technology activities qualify it as a value shop. (Stabell & Fjeldstad, 1998). In the case of the value shop, the company's resources are used to find solutions to a particular problem. With a value chain, the purpose is achieving economies of scale with relatively standard products.

As it was mentioned in the case, diabetes in China follows an entirely different dynamic than in the industrialized countries. It can be inferred that the problem is unique and needs a special, localized solution – hence, local research. In addition, Novo Nordisk tackles



these new challenges through its parallel physician training programs or through its patient education measures.

One of the main characteristics of the value shop is that there are limited advantages in dealing in large volumes – location is much more important. Given the rise of diabetes in Asia, it is possible that Novo Nordisk will combine the two concepts: treat a disease with Asian lifestyle specificities, from an advantageous position, but in large numbers and possibly even achieving economies of scale.

### **Novo Nordisk's local commitment in China**

Novo Nordisk claims that “although the Chinese culture is significantly different from that of the West, there is no major cultural barrier for success of a Western style R&D organization in China, because Chinese employees are amenable to changes” (Boel and Wang). However, this statement indicates two things; firstly, that Novo has made a cultural observation in terms of the Chinese employees being open to change and secondly, Novo Nordisk has employed resources for training of their employees. This could indicate that Novo Nordisk has been successful in terms of creating an environment which suits the Chinese culture, e.g. though clear objectives (ibid.). Additionally, Novo Nordisk emphasizes that their management style is rooted in Chinese traditions. This example entails recognition of accomplishments and clear orders (ibid.).

In terms of both team work and innovation, Novo Nordisk has met some challenges in their Chinese operations. As team-work is not customary in the Chinese culture, but it is crucial for the working processes of Novo; therefore, the local management teams have been given the task to motivate team work. Novo has found that there is a low level of PhD training in innovation in China, which represents a challenge for a company with a necessity for innovation. However, Novo sees great potential which may be exploited by bringing in western scientists.

Local impact and socioeconomic improvements are high on the list of priorities for Novo Nordisk, in addition to seeing a huge business potential in China (Novo Nordisk, 2004). “Diabetes poses a growing social, educational and economic challenge for the Chinese society and the people and families affected by diabetes. An estimated 40 million people in China have type 2 diabetes in 2010, a number expected to reach 80 million over the next 15 years” (Novo Nordisk, 2011). When presenting its operations in China, Novo Nordisk, thus, has great emphasis on the CSR aspects, such as local job creation, strengthening the health care system and the education of employees (ibid.). This correlates well with China's status as a developing country, with insufficient institutions and infrastructure (Hansen et al. 2010). In order for Novo Nordisk to be successful, it is highly relevant for the company to train the scientists and educate the consumers, and its positive impacts on the Chinese society not only creates legitimacy but also represents a great importance in regards to the relationship with the Chinese governments and society.

## **5. Lessons Learned and Conclusions**

Given Novo Nordisk's experience in China, Western multinationals can benefit from the lessons learned through its operations, successes and challenges. Specifically, the points below can be emphasized:

- An early-mover advantage is important in the pharmaceutical industry, especially in a market with the growth rate and size of China.

- Setting up the R&D Center in Tianjin gave Novo Nordisk location advantages.
- China is seen as a market in itself and not as offshoring site.
- In the case of pharmaceutical companies, the value shop approach is more effective than the value chain approach.
- Knowledge transfer does not necessarily occur automatically, there is a need for local specialists, not just foreign consultants.
- In an emerging economy/developing country, employee training and consumer education are of high importance.
- There is increasing confidence in emerging markets that they can handle the complexity of the entire research process.
- Cultural differences should be taken into account, e.g. in relation to management issues and reward systems.
- Novo Nordisk may use China as a starting point for Asian expansions, as the diabetes in Asia is very specific, so the knowledge gained in China can be useful.

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