E-Supplement to Chapter 2 Examples from Different Industries, Services and Continents

In this E-supplement to Chapter 2, you fill find additional examples of:

- operations and SCs in manufacturing
- operations and SCs in services
- e-operations and SCs

Case study – Organic Valley: The cooperative organic farmers

An organic product is one that has to be produced following the quality standard set by national governments. Demand for organic products is growing every year. However, the supply of organic products grows slowly. Therefore, it is challenging for managements to find adequate sources of organic products. Previously organic products were primarily sold in natural product stores, whereas statistics show that more than 50% of organic products are now selling at conventional retailers. For a product to be labelled as organic, all the processes used have to be certified as organic. Therefore, all parties that belong to the SC have to have specific knowledge. Hence, it may be difficult to find qualified SC partners.

Organic Valley is one of America's leading organic brands, and was founded in 1988 by Cooperative Regions of Organic Producer Pools (CROPP), the largest cooperative of organic farmers in the USA. Now it represents 1,834 farmers in 36 states. Its founding mission is to save family farms through organic farming. CROPP is founded based on a cooperative structure, meaning that each farmer is required to establish equity when they join the cooperative. It is governed by producer groups, called "pools", and an elected board of directors. Each pool has its own Executive Committee (EC), elected from its farmer members. In the following paragraphs is an analysis showing how Organic Valley manages its SC.

Sourcing strategy
Organic Valley uses a *regional sourcing strategy* which means that milk is produced, bottled and distributed right in the region where it is farmed. While using regionalization strategy, the cooperative is able to achieve logistical efficiency as well as regional identity and brand growth.

Collaboration strategy
Organic Valley develops *long-term relationships* with its strategic partners. It contracts out key processing and distribution activity and employs strategic partnerships with processing partners and distribution partners as well as retail and food service partners. With *stable premium prices* for farmers, a *profit sharing programme* and a *cooperative structure*, Organic Valley is able to successfully recruit and maintain farmer members. It also provides supporting services for its mem-

bers as well as consulting and financial assistants to help new farmer members make the transition to organic. Moreover, it uses *regional decentralized decisions*, so that the EC of each pool will decide about production, processing, delivery and payment for farmer members.

Transportation strategy
Organic Valley focuses on its logistic services, which include food quality monitoring, traceability, recall capacity and prompt delivery. Moreover, the in-house logistics company was established to manage the logistics functions of the cooperative, as well as provide these same functions to other companies selling organic and natural foods. By selling "empty space" on its truckloads, the cooperative is able to increase the volume of freight and achieve full truck loads. As a result, distribution costs can be reduced.

Australian Food Supply Chain: Focus on Resilience

Thousands of companies, ranging from highly sophisticated international companies to local sole traders, as well as more than 20 million consumers, are involved in the Australian food SCs which incorporate a diverse range of production areas, processors, manufacturers and retailers.

The process involved in the transfer of e.g., beef from farms through to the final consumer in Australia or overseas has four main levels: cattle production, beef processing, beef wholesaling/retailing and final consumer.

The two largest supermarket chains (Woolworths and Coles) have integrated operations and SCs. However, other SCs with small and medium-size beef producers are partially integrated, with activities only from production to slaughtering, or from processing to end customers. As with all physical SCs, the resilience of the food SC depends on a range of infrastructure for continuity of production, processing, distribution and retail such as power, water, financial services, communications and transport services. Resilience refers to the capacity of organizations or systems to return to full functionality in the face of disruption. The characteristics of a resilient logistics network or SC are commonly identified in terms of redundancy and flexibility.

For example, the beef sector in Australia is undergoing rapid change because of globalization and a highly competitive meat market. Uncertainty in demand from both local and international markets, combined with extreme weather uncertainty influencing the supply side of the industry result in possible threats to beef SCs.

In this context, the industry has moved to improve production efficiency and has developed a quicker production cycle and delivery times, and consequently has reduced inventories. The Australian food SC has also demonstrated resilience in the face of unexpected events. The Queensland floods during December 2010 to January 2011 were severe and widespread. The town of Rockhampton, with a population around 75,000, was cut off by road, rail and air for two weeks; Brisbane came within a day of running out of bread for its population; around 100

large retail food stores and many smaller food outlets were inundated. The experience revealed both the resilience and fragility of the food SC. Restocking was made possible largely through supply links to Sydney and Melbourne, and routing stock through the far west of Queensland. However, had there been a disaster, such as the Victorian bushfires of 2009, at the same time as the Queensland floods, this restocking effort would not have been possible.

References

Jie, F., Parton, K.A. and Cox, R.J. (2012). 'An agile supply chain analysis of Australian beef wholesalers and retailers', Int. J. Agile Systems and Management, 5(4):297–318.

Barton, S. et al. (2012). Resilience in the Australian food supply chain. Report for the Commonwealth of Australia by Sapere Research Group.

Maquet: SC in building and construction industry

SC Management in the building and construction industry is very challenging for many reasons. The products in this industry can be standard products. But often, products are unique and the SC has to be individually considered for each project. This uniqueness can also imply legal regulations and climatic issues in different locations and countries. In addition, the final product (e.g., new bridge) cannot be shown to the customer in advance.

The company Maquet (is a producer of medical technology products. It has 6,300 employees worldwide. The global network of the company includes 11 production plants in six countries, 45 subsidiaries and service units, and 300 dealers. Among the products are operating tables, operating lights, telemedicine, etc. One of the products is called a variable operation theatre which is a flexible room system consisting of a substructure and different elements (like wall and ceiling elements). This system has relatively short installing and reinstalling times and it is very flexible. Therefore, it can be used indifferent places. The customers are public and private hospitals and governments. When the company receives an order, the question arises: How to make sure that the right material is delivered at the right price at the right time? Therefore, the company first clarifies all the customer's needs for the project. After cost estimation is made, the project can be worked on. As such a project is quite complex; many different companies work on it using different systems and share and exchange their information.

The company's SC is presented in Fig. E2.1:

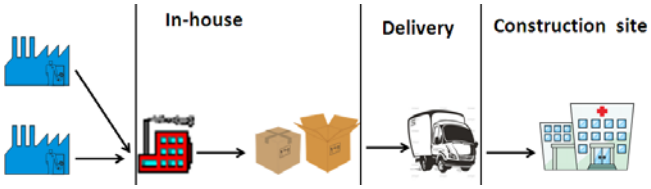

Fig. E2.1. Maquet's SC

Raw material is delivered to one of the producers in Germany where the wall and ceiling elements for the room system are then being produced. When he parts are finished, all modules will be packed in containers and transported by a logistics company to the point of destination. On site, the system will be built up by experts; the last step is that the customer approves the project.

Reference
www.maquet.com

Pharmaceutical SCs

The pharmaceutical sector needs sophisticated SC optimization techniques. The main issue in this industry is to balance future capacity with anticipated demands in the face of the very significant uncertainty that arises out of clinical trials and competitor activity. Even before the capacity planning, there is the problem of pipeline and testing planning, where the selection of products for development and the scheduling requires a long lead time and careful management of risk and potential rewards.

At the production stage, the planning difficulty involves primary production, due to active ingredient (AI) production (batch production), and secondary production (formulation). Both of these stages have to be completed to a certain deadline because AI usually has a short expi-ration period. In this environment, SC, manufacturing and inventory management are crucial for quick responses to a changing market.

Consider the SC of a pharmaceutical product (Fig. E2.2).

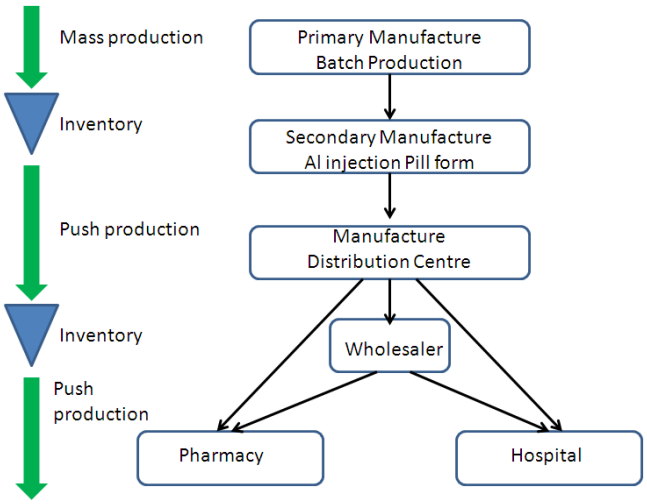

Fig. E2.2. Pharmaceutical SC

It typically takes about ten years to result in a potential new drug that has been registered. This involves a variety of trials. A typical pharmaceutical SC consists of five steps. First, primary manufacturing produces a large batch of chemical. Secondary manufacturing then produces drugs which go to warehouses or distribution centres. Fourth, the medicines go to the wholesalers and then finally to retailers or hospitals.

The primary manufacturing site is responsible for the AI production in batch form. The manufacturing process is characterized by long task processing times. There are many quality checks before being approved for use downstream in the process. Then the secondary manufacturing is concerned with taking the AI produced and adding materials along with further processing, including granulating, compressing, coating, quality control, and packaging to produce the final products. The secondary manufacturing locations are often geographically separated from the primary locations.

Reference

Shah, N. (2004). Pharmaceutical SCs: Key issues and strategies for optimisation. Computers & Chemical Engineering, 28(6–7): 929–41.

Smart Hospital: Seoul National University Bundang "Smart Hospital" (SNUBH)

The SNUBH located south of the Korean capital is the first hospital of its kind offering a variety of mobile application-based services. Patients can download a free mobile app called "patient guide" which can be used for registration and directions to the room assigned to them. Through the mobile registration, doctors already have access in the hospital information system to the patient's medical records. Customer feedback for the service received is also provided through the patient guide. Back at the hospital entrance, the patient can use a payment terminal to settle the bill electronically. For in-patients the hospital has tablet PC bedside stations providing information on drug prescriptions, health records and examination schedules. In addition, the tablet can be used for ordering dishes as well as entertainment. It is planned to have emergency alert features using local sensors (for blood pressure, etc.) in the future.

The mobile application in connection with the hospital information system brings about many benefits for both the patient and the hospitals operations management. The patient can receive a significantly better quality of service, as lining up for registration is not necessary; waiting times can be reduced through automated and optimized scheduling and services can be more customized due to facilitated electronic communication. The hospital in return can streamline its workflow through real-time scheduling of appointments and capacity planning, as well as possibly more efficient facility layouts as registration counters and large waiting rooms may become obsolete. A major challenge for the implementation of a smart hospi-

tal could be the integration of multiple mobile applications with the hospital's information systems.

Wal-Mart: information technology as success leverage

Walmart's SCM is based on a strong usage of information technology and strong commitment to the market leadership due to integration of suppliers, manufacturing, warehousing and distribution. Walmart was also one of the first retailing companies to centralize its distribution system and use RFID technology. Walmart's SCM comprisesthe following stages:

Fig. E2.3. Maquet's SC

Successful SCM allows Walmart to maintain sustainable competitive advantages, for instance, to: improve in-store variety, lower inventory costs, lower product costs and maintain highly competitive prices. Walmart's distribution costs represent 1.7% of cost of sales, whereas the main concurrent competitors, Kmart and Sears, have 3.5% and 5% respectively.