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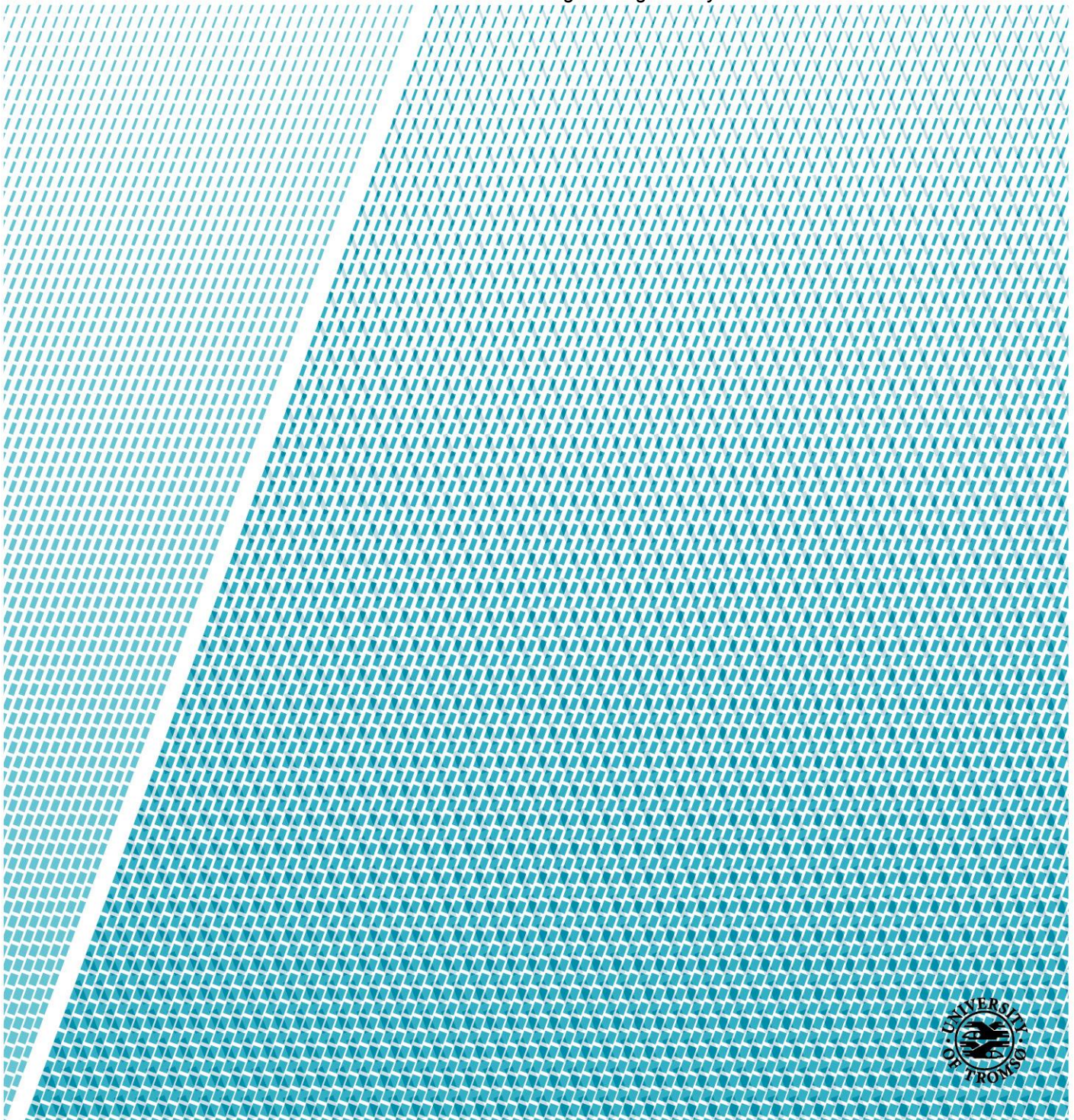
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A Business Model for Small and Medium-sized Manufacturers (SMEs) in Sparsely Populated Areas in Northern Norway

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Abstract

As Northern Norway is considered as a low population density area with small and dispersed settlement structures, dispersed economic foundation with simplification, and focus on primary production. Manufacturing firms in Northern Norway are predominantly Small and Medium-Sized Enterprise (SMEs). With the development of globalization and the industry 4.0 trends, manufacturing industry focus more on lower the cost and developing economies with rapid advances in new technologies, SMEs especially manufacturers in Northern Norway are facing great challenges such as geographical seclusion from the major market and a low capital turnover ratio. In this paper, I focus on the current situation of small and medium-sized manufacturers and come up with a new business model for enhancing the competitive of small and medium-sized manufacturers in sparsely populated areas in northern Norway.

Keywords—SEMs; Northern Norway; Manufacturers; Business model;

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1 Introduction and Production Statement

1.1 Introduction

With the advent of industry 4.0, the design process, manufacturing process, operation process, production and service system will be revolutionized by the establishment of a global network that supported by the Cyber-Physical System (CPS).

For manufacturing industry, CPS consist of intelligent machines, storage system and production facilities that can operate independently and control mutually, thus the industrial process can be fundamentally altered by transforming the manufacturing process, material utilization, supply chain and product lifecycle management. [1]

Since the reduction of vertical integration of large scale companies and the growth of the value network among small companies that help them collaborate with each other, industry 4.0 also be considered as an opportunity for SMEs. In order to seize the opportunities and be able to be competitive in the new business environment, small-scale manufacturers in Northern Norway need to optimize their business by modifying or even change the old ways of design, product, delivery and a series of business activities. The ability of business innovation requires the design, implementation, and management of new business model. [2]

Business models are designed and utilized to cope with the specific commercial environment, and it describes how a business organization generates revenue with the function of its structure, the collaboration with its partners and interaction with customers.[3] Thus, figure out framework and elements is a necessary work to conduct.

The aim of this paper is making a clear understanding of the definition and configuration of the business model by considering the idea proposed by other researchers. And then put forward a new structure of the new business model, modify the detail of each component to transform it suitable for small and medium-sized manufacturers in northern Norway in order to help them obtain high competitiveness.

1.2 Problem Statement

So, with the understanding of how the business model is crucial to a business organization's survival and development in mind, we are lead to the problem statement as follow:

“How to design and modify a suitable business model for small and medium-sized manufacturers in Norway to help them sustain competitive advantage?”

The main problem can be divided into the following research questions:

- What is the definition and components of business model from other researchers' point of views and the suitable fields of these business models?
- Based on the literature review and theoretical insight from research question 1, which components should be used to construct the new business model for SMEs, especially the small and medium-sized manufacturers in Northern Norway to help them obtain and sustain competitiveness?

- In each component of the new business model, which strategies or method is the most suitable one for small and medium-sized manufacturers?

1.3 Research Strategies

1.3.1 Research Process

Building up a complex and suitable new business model structure needs a great deal of theoretical foundation, and the conclusion needs recycling analysis, and after obtaining a final structure, each component also needs to be assessed and evaluated.

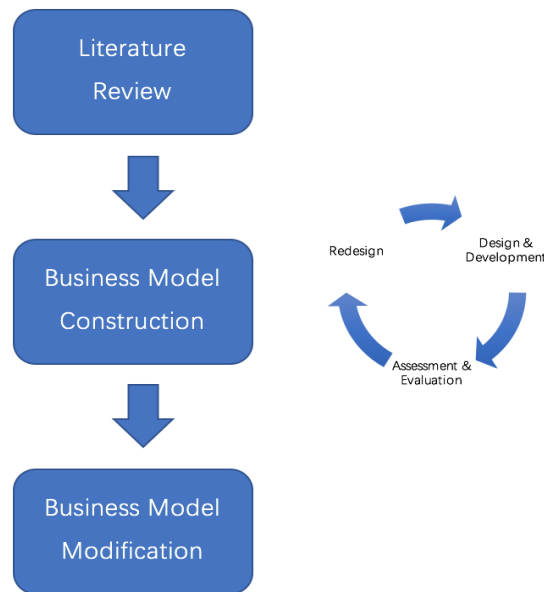


Figure 1 process of Study

1.3.2 Information Collection

This sector describes how we gathered information that supports our research and can be classified into two part, business model literature and data collection.

1.3.2.1 Business model literature

As the business model do not have a common definition and structure, at the beginning of my study, I search the Internet by Google the keyword “business model” and get a vast amount of reports and research. To generate a clear definition of the business model and which components should be considered, I narrowed it down to about 40 articles that involved in different industries. Especially, I study on the business models proposed by other authors, specifically rely primarily on the contribution of Alexander Osterwald, Scott. M. Shafer, Jane Linder, Jonas Hedman, Joan Magretta, Raphael Amit and Christopher Zott. Texts in this review are selected according to the business models that suitable for different industries and variable structure. The business models that mentioned in the literature research part are in diverse domains, such as manufacturing industry, e-business and so on. However, as the business models are designed to apply in different fields, and there are some common components in various structures, to identify the different of these components, I have studied more literature on these components. The result of business model literature research is shown in part two of the thesis.

1.3.2.2 Data collection method

In this project, I mainly use secondary data that involved different kinds of literature, such as books, reports, and articles. The source of these data is from professional website and google and my supervisors.

2 Business Model Literature Review

As the study aspects and academic background of the researchers are variant, the definition and structure of business model have a great diversity. In the following words, I will list some typical business models and their definition, structure, and components.

2.1 Alexander Osterwalder’s Business Model

2.1.1 Definition

From Alexander’s point of view, business model refers to the rationale of how an organization or a firm creates, delivers, and captures value. The business model is a kind of conceptual tool consisted of series of factors and the relationship between these factors. The business model describes the customer value, the inner structure, partner network, relationship capital and other elements that can create, deliver and capture values and produce the sustainable profit. [4]

2.1.2 Components

As Alexander’s study focuses on helping entrepreneurs establish their own business, he came up with a canvas that depicts how each business model component interact each other. As the purpose of Alexander is helping entrepreneurs easily understand what business model is and establish their own business according to the canvas, his business model has a planar structure. Alexander separates the business model into nine components: value proposition, customer segment, distribution channel, customer relationship, revenue stream, key resource, key activities, cost structure and partner network. However, each component has several alternative options.

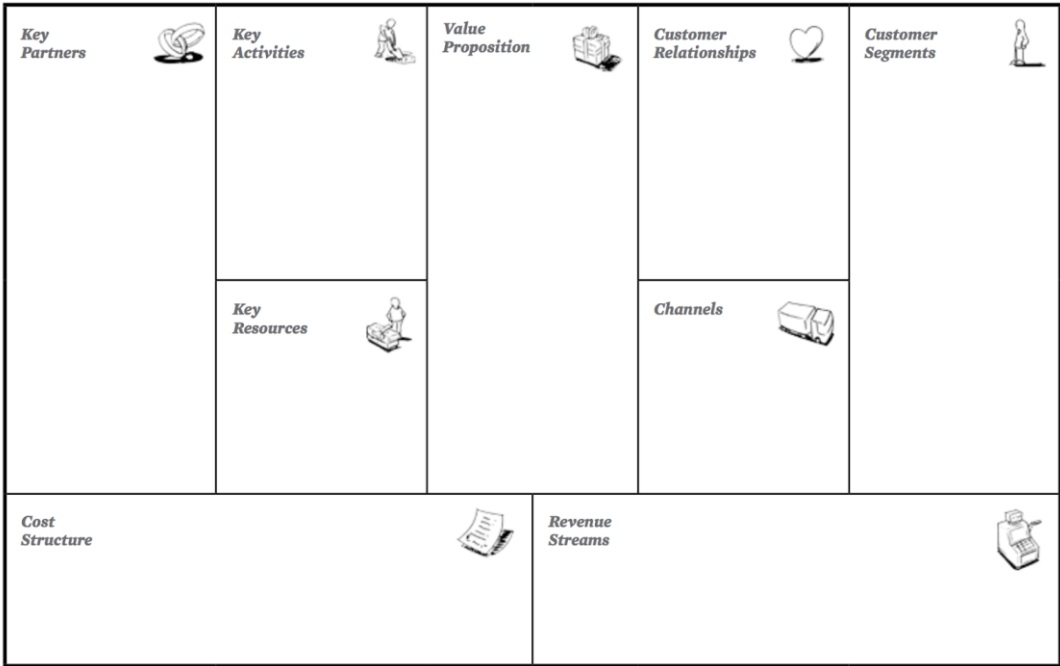


Figure 2 Structure of Osterwalder’s business model canvas

2.1.2.1 Value proposition

Alexander regards Value proposition as the way that how a business organization solve a customer's problem or satisfy a client’s need. It focuses on what value the business organization can deliver to its clients. According to Alexander’s point of view, there are 11 types of value proposition can be chosen:

- **Newness**

Often used in the technology industry, aim to satisfy new and special need of the customers. Establish commercial advantage by providing un-similar product or service.

- **Performance**

Enhancing the user experience is the most traditional and common way to create value. By improving the level of service or the quality of the product, a business organization can establish business advantages. But create value proposition by enhancing performance also has limits, as the technical restriction, it is hard to cater the customers demand by improving the existing product or service.

- **Customization**

Create value proposition by modifying the product and service to cater the demand of specific customer segment. By providing more accurate service and particular product to the specific customer, the customer satisfaction can be increased.

- **Getting job done**

Create value proposition by helping the customers finish their works, this kind of value proposition always used between engine manufacturers and airline companies.

- **Design**

Often be utilized in the fashion industry, business organizations create the business advantage by providing a better design, but as the design is always an abstract concept, it is hard to realize.

- **Brand**

The brand has a huge influence while customer chooses product and service, customers may choose a special brand to satisfy their psychological demand or depict status, wealth, and identity, but creating the brand effect is a long and complicated process, it needs a lot of resources and time.

- **Price**

Compare with its competitors, business organization who choose to use this way to create value proposition aim to provide similar or even higher value to its customer at a lower price. It is attractive to customers but will influence the other part of business model.

- **Cost reduction**

Create value by helping customers reduce their cost. It is more like a third party that connects the sellers and customers and helps the customers enjoy the service or product at a lower price. Often used in the APP industry, such as Airbnb.

- **Risk reduction**

Often used in secondary market or IT industry, it helps the customer reduce the risk of suffering losses by selling them the guarantee.

- **Accessibility**

By increasing the accessibility of product and service can improve the customer satisfaction.

- **Convenience**

Making product easier to be used can improve customer satisfaction and customer loyalty. Often used in IT industry and electronic device industry.

2.1.2.2 Customer Segment

A business organization divides its customers into several big or small groups according to their needs, behaviors and other characteristics in order to satisfy its customers better. After segment the customers, a business organization must divide its service into several levels, that means it should decide which customers segment to be served and which customer segment must be ignored. The types of customer segment are shown as follows.

- **Mass Market**

This type of business model is often utilized in consumer electronic sector. The business model does not segment its customers but focuses on one big customer group that has similar need and problems.

- **Niche Market**

Often appear in the supplier-buyer relationship, firms cater to specific customer segments by concentrate all its resources to satisfy the demand of a specific niche market.

- **Segmented**

Often used in medical industry and industrial automation sector, segment the customers into several groups by their requires.

- **Diversified**

Often used in IT industry, business organization divides its customers into two categories with significantly different needs and requires. And use different resources to satisfy them.

- **Multi-sided market**

Often be used by credit card companies or firms offering free newspapers, companies divide its customer into two or more complementary segments. The two customer segments interdepend on each other and collaborate with each other to make the business model work.

2.1.2.3 Distribution channels

There are two classification methods of the business channel. The first one is classified by the owner of the channels. This method divides the business channel into two categories: Partner Channel and Own Channel. The other classification method is classified by the relationship between the company and its customers. It divided the business channels into two categories: Direct Channel and Indirect Channel. While the companies are designing appropriate distribution channels to deliver their products, the most important thing is to choose the right mix of several channels to satisfy the customer's demand. When a company chooses the appropriate channels, there are 5 phases should be considered.

- **Awareness**

What a company should do to improve the awareness about its product or service.

- **Evaluation**

How a business channel helps the customers to evaluate the value proposition of a business organization.

- **Purchase**

How customers purchase their demand product or service through the business channels.

- **Delivery**

In which ways, a company deliver its value proposition to its customers

- **After Sales service**

How a company provides after - sale service or technical support to its customer to solve problems.

2.1.2.4 Customer relationship

After the business organization has segmented its customers, it should establish an appropriate customer relationship with these customer segments to cultivate customer loyalty and make the profit. There can be several customer relationships between a firm and a specific customer segment, the types of customer relationship that can be chosen as follow:

- **Personal Assistant**

A company can provide its customer product introduction during the purchasing process and technical support after-sale. The personal assistant can be provided by establishing a call center, e-mail assistant center or other forms.

- **Dedicated personal assistance**

Often be used in private banking service, keep contact and communication with a particular individual customer for an extended period and give them support, in this way a company can build customer loyalty and collect customer information.

- **Self-service**

The business organization provides support items to the customers to let them help themselves.

- **Automated Service**

It is another type of self-service, but it is more convenience and automatically

- **Communities**

The company establishes online customer communities to give the customers a platform to exchange information and knowledge to help each other. The platform can also be used by the company to collect customer information and have a thorough understanding of what the customer really want to improve their product/service.

- **Co-creation**

The business organization let its customers involve in the design process and give some advice to improve their product and co-create value.

2.1.2.5 Revenue stream

Revenue streams are complicated, there are two kinds of revenue streams, one is generated from one-time payment, and another one is revenue streams that generated from ongoing payment or after sale customer support. Ways to generate revenue streams can be classified as follows:

- **Asset Sale**

The most common way to create revenue streams, companies sell ownership of a physical product to customers.

- **Usage Fee**

Often used by the hotel industry, express industry and telecom operator, customers pay for the service they bought, the total price they pay increases with the service time.

- **Subscription Fee**

Generate revenue stream by creating membership among its clients, customer pay for the access of using the facilities or long time service of a company, often be used in gym industry, online game industry, and online music service.

- **Renting**

Generate revenue streams by given the customer short-term or long-term right of using a particular item. Often be used by car renting firms.

- **Licensing**

Often be utilized in the technology sector, and media industry, copyright holders, and patent holders generate revenue by selling utilize licenses to third parties.

- **Brokerage Fee**

Generate revenue streams by establishing the connection between sellers and buyers, often be used by credit card providers.

- **Advertising**

Software industry and media industry generate revenue streams by advertising for a specific product/service.

2.1.2.6 Key resources

The different business model needs different kinds of critical resources to create the value proposition and offer it to various customer segments. Key resources can be classified into various types and can be owned by the company itself or leased by its partners. The critical resources owned by a firm can be sort into four main categories:

- **Physical**

Physical properties such as manufacturing facilities, buildings, vehicles, systems and distribution networks.

- **Intellectual**

Brands, proprietary knowledge of a particular product, also include patents and copyrights, a company's partnership and customer databases.

- **Human**

In the manufacturing sector, the most valuable human resource is an experienced technical team and a skilled selling group.

- **Financial**

Companies borrow funds from banks or capital market.

2.1.2.7 Key activities

Actions that a business organization takes to create and deliver the value proposition to its customers. From Osterwalder's point of view, the key activities of a firm have two classifications: production activities and problem-solving activities.

For manufacturers, production activities are the most primary and important activities, it includes design, producing, delivering the final product and all the activities that involved manufacture products. Another kind of the main activities are problem-solving activities, compare with manufacturing firms, this classification of activities is more critical to service organizations, it includes all the activities that aim to solve customer's problems, such as problem consulting and after sale service.

2.1.2.8 Cost structure

All the cost of a business model while it is creating and delivering the value proposition, maintaining customer relationship, and generating revenue streams. For all business model, the cost should be as low as possible. According to whether the cost fluctuates with other factors such as the quantity of product, Osterwalder classified the cost into two categories: fixed cost and variable cost. Fixed cost accounting for the vast majority of cost in manufacturing firms include salaries, rent fees, production facilities. While variable cost refers to the cost that increases with the quantity of product and service, such as raw material cost.

2.1.2.9 Partner network

Companies establish a partner network to gain profit, reduce cost and risk, acquire the resource and keep competitive. The typical partner network is shown below:

- **Strategic alliances between non-competitors**

Business organizations set up an alliance with other companies who have no interest conflict to keep more compatible in business competition.

- **Cooperation**

The companies form an alliance of interest with some competitors and maintain a strategic partnership with them. This alliance is aim to defeat other opponents that not belong to it.

- **Joint ventures**

Company joint capital with other companies to develop new business.

- **Buyer-supplier relationship**

Company sign contract with the reliable suppliers to get stable and continual supply.

2.2 Scott M. Shafer's Business Model

2.2.1 Definition

A business model is a reflection of a firm's strategic choices, and it facilitates analysis, testing, and validation of these choices. [5]

2.2.2 Components

Shafer considers companies' development and business activities are based on series business strategies. First, Shafer divided the business model structure into two level. The first level contains strategic choice,

value creates, value network and value capture. As Shafer lay emphasis on business strategies, among the four components, strategic choice is the key point of his article.

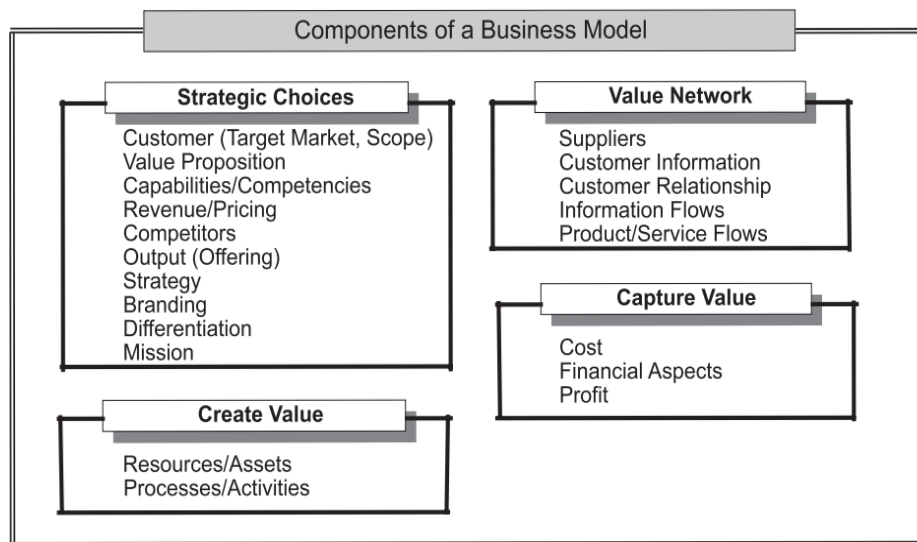


Figure 3 Structure of Shafer's Business Model

2.2.2.1 Strategic choice

According to Shafer's point of view, since the resources and capacities of a business organization is limited, it is impossible to pay attention to every aspect of the market. Companies should choose an appropriate competitive strategic and concentrate its resources and capacities on a specific aspect of the business to achieve the greatest profit and keep compatible in the market. As the strategic choice is a complicated process, there are ten points should be considered while making a competitive strategy of a business model.

- **Customer**

The group of people that interested in your product or service.

- **Value Proposition**

The value that a company can offer to its customer and how this value can be delivered.

- **Capabilities**

The business capability is the capacities, materials, and expertise that a company need to perform its functions.

- **Revenue**

How a company generates cash flow from its customer segments.

- **Competitor**

Competitor refers to other enterprises that provide same or similar product to same target customer segments. There are four types of competitors. [6]

- 1) **Brand competitor**

Brand competitor refers to the competitors that provide product in same specification and model, such as Apple and Samsung.

2) **Product competitor**

Competitors that provide similar product but in lower price

3) **Generic competitor**

Generic competitor refers to the Competitors that offer different products to satisfy similar customers' need. Such as iPad and MacBook

4) **Total budget competitor**

Competitors that meet customer need in an entirely different way but in the same price. Such as iPad and Jordan shoes.

- **Output**

The products of manufacturing firms or the services that companies offer to the customers.

- **Strategy**

Strategy making is a complicated and long-term process. It depicts how a company to stand out from competitors and create customer interest in their product or service. It is important for a firm throughout the whole business process and can be sorted into four major types as shown below. [7]

1) Overall cost leadership

Be the cheapest provider in the market by lower the production and operating cost. As this strategy need large economies of scale, so it is not suitable for small-scale manufacturing firms.

2) Differentiation

Making advantages by offering unique products or service, companies using this strategy rely heavily on technical improvement that most of the small-scale firms cannot afford.

3) Low-cost Focus

Similar to low-cost leadership strategy but focus on niche market. The company using this strategy aims to be the cheapest provider in a particular area instead of the cheapest overall.

4) Differentiation Focus

Concentrate on a specific sub-aspect of market and provide unique product to specific group of customer

- **Branding**

Creating a unique image of a product and deliver it to the customer base, the object of branding is to be outstanding and cultivate customer loyalty. [8]

- **Differentiation**

The process of making a product or service unique and more attractive to differentiating it from similar types products. [9] It can be sort into the following categories

1) Differentiation in price

2) Differentiation in quality

3) Differentiation in function and design

4) Differentiation in availability

5) Differentiation in advertising

- **Mission Statement**

Mission statement refers to the rules, faith, and purpose that a company set up to regulate its business activities.

2.2.2.2 Value network

The value network consists of many internal and external organizations, these organizations cooperate to produce and deliver a company's product to the final customers then earn the profit. [10] In Scott's business model, value network has several sub-components as shown below:

- **Suppliers**

For manufacturing firms, Suppliers are the upstream partners who provide production materials and other resources that needed in the production process.

- **Customer Information**

The customer of a business organization is various, to improve the product and achieve profit maximization, companies should collect, analysis and use customer data to identify the client need, segment the customer groups and create a customer profile. [11] There is a great diversity of customer data and can be sort into four categories as shown below. [12]

- 1) Identity data

Include name information, personal information, post address information, telephone information, email information, social network information, email address information, account information, job information.

- 2) Quantitative data

Include transactional information (online and offline), communication information (inbound and outbound), online activities, social network activities, customer service information.

- 3) Descriptive data

Include family details, lifestyle details, and career details.

- 4) Qualitative data

Attitude information, options, and motivations.

- **Customer Relationship**

Customer relationship is the connection between a company and its clients, the purpose of build up this connection is to help the firm to achieve its business goal. The customer relationship has several aspects should be managed include marketing aspect, selling aspect, call center and order management.

- **Information Flow**

Information flow refers to the ways that how the information is collected, analyzed and transferred internal and external a company, the function of information flow can be defined as connecting, regulating and decision making. [13]

- **Product/ Service Flow**

The transformation process of ownership of the product or service from the supplier to its customers often be represented by the diagram which called PFD (product flow diagram).

2.2.2.3 Create value

The purpose of establishing a business is to create value by produce product or service then deliver the value to the customer and achieve profit by utilizing series resources and activities.

- **Resources**

A good management of different kinds of business resources can help a firm create enormous value and profit and keep competitive in the market. There are three main types of business resources for a company: financial resource, physical resource, and capital resource.

- **Activities**

Business activities include all the activities that involved in creating value and making the profit. It can be separated into three categories: operating activities, marketing activities, and financing activities. [14]

- 1) **Operating activities**

Operating activities include production scheduling making, workflow designing, inventory arranging, maintenance of manufacturing equipment and all the activities that involve converting raw materials into products that have value to the customers.

- 2) **Marketing activities**

Include pricing, packaging, distributing, market study and all the activities that can help a company's product seize market share and keep competitive in the market.

- 3) **Financing activities**

Include budgeting, fund allocating, investment and all other activities that help a company to manage its capital flow and ensure its financial situation healthy.

2.2.2.4 Capture value

In capture value aspect, Scott has set up three dimensions: Cost, Profit, and Financial Aspects.

- **Cost**

Cost refers to the money that a business organization should pay to create, marketing, and deliver the value to final customers. In Shafer's point of view, the cost is the fund that is used to operate business activities and a vital link in implementing business strategies.

- **Profit**

For a business organization, profit refers to the surplus that equals to total revenue minus total cost. As Shafer's business model concentrates on strategic choices, profit can be considered as the measure of success.

- **Financial Aspect**

Financial aspect refers to the analysis tools and methods used to help a business organization manage its capital. Financial aspect can help companies have a clear understanding of its current pecuniary condition and make decisions. The function of financial aspect can be sort into four categories as follow. [15]

- 1) **Forecasting and Planning**

- 2) **Accounting and Measuring**

- 3) **Financial Condition Monitoring**

4) Decision Making and Analyzing

The three dimension of capture value model interact each other and help firms generate value.

2.3 Jane Linder's Business Model

2.3.1 Definition

The Business model is the organization's core logic for creating value. It helps firms to remain profitable and improve the companies' focus, establish a framework to let the firms keep agile in the competitive environment. [16]

2.3.2 Components

Linder's business model is similar to Osterwalder's, and the structure is in a geometric plane shape. Linder separate business model into seven sub-components: Pricing model, revenue model, channel model, commerce process model, Internet-enabled commerce relationship, organization, and value proposition. However, Linder's business model study is unique in putting forward the impact of organizational structure and the changes in commerce caused by the Internet.

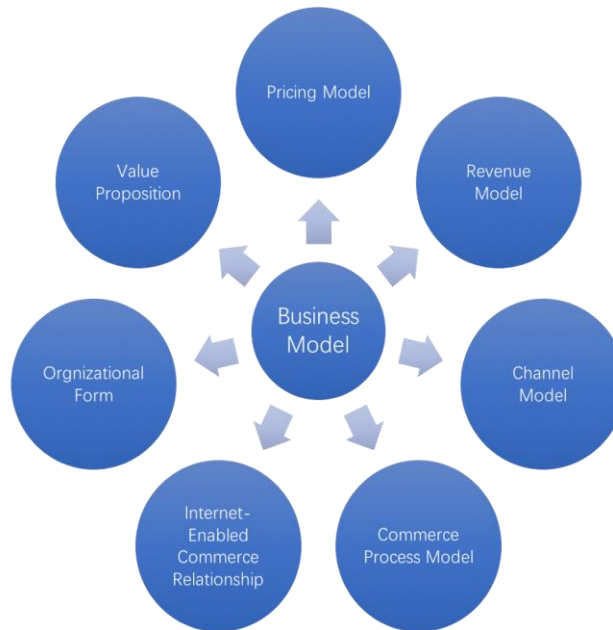


Figure 4 Structure of Linder's Business Model

2.3.2.1 Pricing model

Pricing models are the method used by a business organization to determine the price of its product/service, several factors such as cost, demand, and positioning should be considered during the pricing process. The types of pricing method most commonly used by firms are shown in the figure. [17]

- **Cost-Based Pricing**

The final price is obtained by put the cost and profit margin together and can be sorted into two categories:

- 1) Cost-plus pricing

The simplest pricing method, the price set up by adding a fixed percentage of the total cost to the total cost itself. Cost plus pricing method is the most common pricing method used by manufacturing companies.

2) Markup pricing

Often used by retailers, the final price is a combination of the price of a product that the retailer has taken from the wholesaler and a fixed percentage of it.

- **Demand-Based Pricing**

Price is based on the demand of the product, and the price increases with increasing market demand, this method relies on the accurate analysis of the market.

- **Competition-Based Pricing**

Often used by the airline industry, the price is determined by considering about competitors' price of the similar product, the final price may higher, lower or even equal to the competitor's' price.

- **Other Pricing Method**

1) Value Pricing

Companies provide the high-quality product to the customer at a low price and aim to be the cheapest provider in the market. Firms use this pricing method to cultivate customer loyalty and seizing the market.

2) Target Return Pricing

Price is fixed and determined by expected return of investment

3) Going Rate Pricing

Price determined by the market leader, other companies who provide similar product just make their price around the prevailing price set by the market leader.

4) Transfer Pricing

Often happened internal a business organization, different department using this method to the transaction with each other to evade tax.

2.3.2.2 Revenue model

Revenue model identifies where and how a company can generate value and deliver its value to the customers. [18]

- **Production model**

Companies generate revenue by selling its product to customers. This revenue model has two sub items:

1) Manufacturing model

Manufacturers consume material, labor, and other resources to produce goods, then sell the goods to wholesalers, retailers or subsequent manufacturers to generate revenue.

2) Construction model

Generate revenue by construct and sell the buildings to the certain customers.

- **Rental model**

Generate revenue by renting the temporary use right to customers.

- **Advertising model**

Generate revenue by providing publicizing platform to customers.

- **Commission model**

Generate revenue by play the role of a third party and intermediary between the sellers and buyers.

- **Fee for service model**

Generate revenue by charge use fee during customer using product or service.

- **Licensing model**

Companies who have content of a product or design generate revenue by selling the licenses.

- **Markup model**

Often used by wholesalers and retailers, generate revenue by the price difference between the price purchase from the manufacturer and the selling price.

- **Subscription model**

Companies sign the contract with customers to provide product/service to the client in a certain period and generate revenue by charge fee from customer regularly before the contract expired.

2.3.2.3 Channel model

Marketing channel, also called distribution channel, is a series operation that transfers the ownership of a product or service from the original manufacturer to the final customer. Distribution channel has several functions, such as gathering information, financing and risk taking, physical distribution, matching and negotiation, promotion and contacting. [19]

- **Manufacturer-Customer**

Manufacturing company sell the product to the customer directly, there is no broker between original producer and final customer, include two sub-distribution channel: brick and mortar, click and mortar. This type of channel is suitable for raw material suppliers such as farmers and fisherman.

- **Manufacturer-Retailer-Customer**

Retailers purchase the product from the manufacturer and sell the goods to the customer, this type of channel gives the client place and time to select the product before purchase, but will cause competition between similar products, often used by shopping goods manufacturers.

- **Manufacturer-Wholesaler-Retailer/Customer**

Setup wholesaler in the area that has many retailers with a large number of demands, this is an efficient way to reduce the inventory and transportation cost.

- **Manufacturer-Broker-Wholesaler/Retailer-Customer**

In this type of channel model, there exists a mediator or agent with negotiation between the manufacturer and buyer.

2.3.2.4 Commerce process model

The business process includes a series of related tasks and activities to accomplish an organization's business goal. These activities and tasks can be sorted into three categories: primary process, supporting process and management process. [20]

- **Primary Process**

Consist of critical activities that a business organization need to active to achieve its goal, each step in this process add value to the product or service, include product process, marketing process, transporting process and after sales service process

- **Supporting Process**

The activities and steps in supporting process aim to provide support to primary process but add no value to the final product, including information management process, technology management process, human resource management, and capacity management.

- **Management Process**

Used to monitor and control other commerce processes to make them go straight to the business goal and make sure all these processes functional and efficient.

2.3.2.5 Internet-enabled commerce relationship

Internet-enabled commerce relationship also called e-commerce relationship. E-Commerce refers to buying and selling activities through the internet. It is one of the unique points of Linder's business model that makes it different from the others, and it can be divided into five categories. [21]

- **Business to Business (B2B)**

Online commerce process between companies, about 80% of e-commerce is in this type, it establishes and cooperation between enterprises. The website of manufacturers who is using this kind of electronic commerce often need visitors to log in while they browse the web page.

- **Business to Customer (B2C)**

Manufacturers sell their products to their final customers through the internet, and the manufacturer has its own shopping website that available for all visitors.

- **Customer to Customer (C2C)**

Customers sell goods to other clients, negotiate and transact through the Internet, companies who use this type of e-commerce offer a transaction platform to the customers.

- **Customer to Business (C2B)**

The customer drives the transaction, customers request what kind of specific product or service they want and post an expected price of the product they wish to buy for companies to auction.

- **Mobile Commerce**

Buying and selling goods and service through the wireless device, more convenient for the transaction, often be used in information service industry.

2.3.2.6 Organizational Form

Organizational form refers to the department setup and the function allocation internal and external a business organization. It is another difference of Linder's business model, and different organizational forms make the business operations various.

- **Stand-alone business unit**

Each unit of a business organization do their own job and add value to the product. There is no cross-functional operation during the production process.

- **Integrated internet capability**

All internal and external business units connect and interact each other. Units build up a comprehensive network, assigning responsibilities, allocating resources, and disposal problems.

2.3.2.7 Value proposition

The role of the value proposition to a firm is to balance the cost and value of its product or service. The aim is to find the best combination of cost and value to achieve the greatest profit for the company. In Linder's opinion, there are three different kinds of the value proposition that a firm can take to obtain benefit: less value and very low cost, more value at the same cost, much more value at greater cost.

2.4 Jonas Hedman's Business Model

2.4.1 Definition

The business model is a strategy model. It is also a combination of resource bases, structure, product, external factors and all the finer aspects of strategy. [22]

2.4.2 Components

As designed for E-business, it is evidently different from Osterwalder's plant business model structure, also not same with Shafer's layered structure, in Hedman's article, he separated the whole business process can be into two sub-process: initial condition process and managerial choices process. The goal of Hedman's business model is to create value and keep competitive in the market by taking two generic strategies: differentiation strategy and low-cost strategy in each level of the business model. In each sub-process, Hedman also sorts the components into five levels: Market level, Offering level, Activity and organizational level, Resource level, and Supplier level.

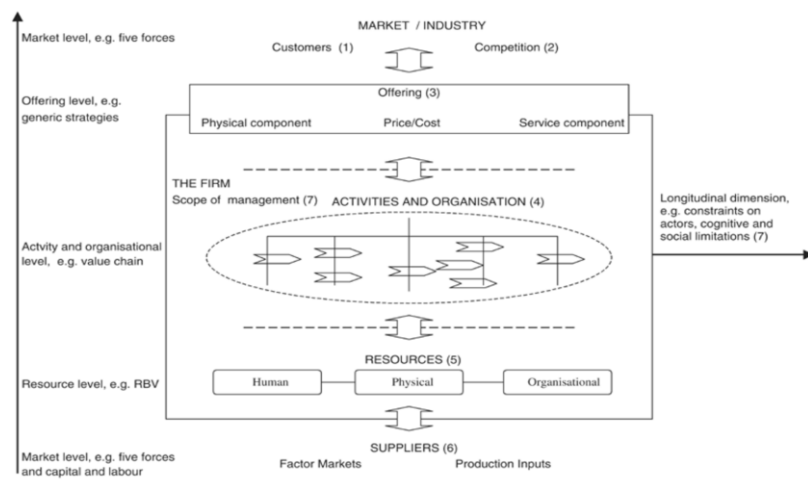


Figure 5 Structure of Hedman's Business Model

2.4.2.1 Product Market Level

In this level, business actors of a company focus more on the production than administration or follow-up service to improve the quality and uniqueness of the product, optimize the delivery process to achieve first mover advantages. In this level, companies should consider about two factors as shown below.

- **Customers**

The customer is the group of people who interested or have the potential interest in your product or service. In product market level, companies should have a clear understanding of what the customers want and in which way the customers can be satisfied with your product or service to optimize the client function, technology and material of their product to create customer loyalty and keep competitive.

- **Competitors**

Competitors are companies who have the conflict of interest with your company, in product market level it can be sort into three categories, direct competitor, indirect competitor, and potential competitor.[23] The direct competitor focus on the exact same customer segments, produce same product in same technologies and deliver it in the same business channel. Indirect competitors are companies who provide the different product with you but aim to satisfy the same needs of same customer segments. The potential competitors are the companies who are not a threat in the market at present but have the ability to overcome the industry barriers and take part in the market competition.

2.4.2.2 Offering Level

In this level of the business model, the proposal of companies is finding the balance point between the cost and the quality of the product. The key point of the operation in this level is integrated different units of a business organization (internal and external) to improve their activities and performance to achieve more profit.

- **Physical component**

The physical component is the business units of a company. The main business units for most businesses are Decision-making unit, Executive unit, and Supervisor unit. Decision-making unit is the most important unit in a business organization. Its function is gathering information, analyzing the market situation, and making suitable strategies to solve problems and improve competitiveness. The executive unit is usually the largest department in a firm. It involves material procurement, product production, product marketing, and all the immediate business activities. The function of supervisor unit is monitoring other unit and make sure other units can run efficiently.

- **Price/Cost**

Price and Cost are two distinct concepts. The cost is the total consumption that relates to ownership and uses right of a product or a service while the price is the amount of remuneration to be paid to the supplier of a goods or a service. Price can be changed and influenced by demand and supply, companies and their partners should take a series of measures to minimize the influence to control the price stay in a small range for a period. The cost can be divided into two categories: direct cost and indirect cost. Direct cost refers to the cost attribute to production include “raw material cost” used to produce a product, “labor cost” that paid to staffs for the work that related to producing product and “expenses cost” that related to the manufacturing process. While indirect costs are the costs that not direct attribute to production process include “material cost” that paid to storage materials, “labor cost” such as security staff wage and so on, “expenses cost” such as rent fee and insurance fee. [24]

- **Service Component**

The service component is the units in a company that provides service to the customer during and after product purchasing process.

2.4.2.3 Activities and Organizations Level

Serious business activities and organizations internal and external a company that aim to provide and deliver value to customers. Such as value chain.

2.4.2.4 Resource Level

- **Human**

The human resource refers to the managers, workers, experts and all the other staffs who involved in the manufacturing, selling, after-selling service and other business processes of a business organization.[25]

- **Physical**

The physical resources refer to all the assets that owned and used by a company include land, building, manufacturing machines, and office equipment. IT equipment, hardware, software, vehicles and all the physical assets that involved in a company's business process.

- **Organizational**

Organizational resources are the property owned by the company and available to use in the production process include raw material, capital and monetary, all the organizational resource will be transferred into the product by operating manufacturing process. [26]

2.4.2.5 Supplier Level

- **Factor market**

Factor market refers to a business relationship between a company and external partners that transact or exchange production factors. It can be sort into five categories: land market, labor market, capital market, technology market and information market. [27] Firms purchase these production factors to produce the product and provide value to customers.

- **Production input**

Production input refers to factors of production that used by a company to produce output. It is divided into three types: fixed input, variable input, and quasi-fixed input. The quantity of the variable input can be increased or diminished and affect by output, such as labor, energy and raw material, while the volume of a fixed input is constant in the production process, for instant buildings and capital equipment. Different from fixed input that exists whether the output is zero or not, quasi-fixed input need not be purchased when the output does not exist. [28]

2.5 Joan Magretta's Business Model

2.5.1 Definition

The business model is a system that let different parts of a business organization (internal and external) fight together to keep competitive. [29]

2.5.2 Components

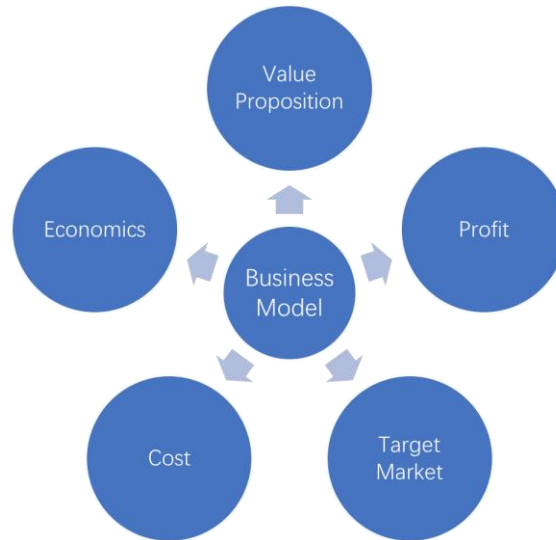


Figure 6 Structure of Joan Magretta's Business Model

2.5.2.1 Value Chain

The value chain can be divided into two parts. Part one includes all the activities that associated with manufacturing product such as design process, purchasing materials, and manufacturing process. Part two refers to the activities that involve selling products, for example, finding and reaching customers, transacting sales, distribution of the goods and delivery of service.

2.5.2.2 Target market

The particular segment of customer that a company aims to provide its products or services to. Companies should segment their customer into distinct groups by their characteristic such as gender, age, location, educational background and so on. A useful classification of customer segments can help companies reduce cost and improve revenue. [30]

2.5.2.3 Economics

Economic means series financial activities that used to determine whether a business model can achieve profit by calculating the cost and profit of a single service or product, if the consequence is positive, the company can get revenue, and the business model is successful.

2.5.2.4 Cost

Cost refers to the money that a business organization should pay to create, marketing, and deliver the value to the final customers.

2.5.2.5 Profit

Profit can be divided into three major categories: gross profit, operating profit, and net profit. Gross profit refers to the profit revenue after the deduction of direct cost. The direct cost does not include management cost, financial cost, selling expenses and tax. Operating profit is the central part of the profit of the business. It is consisted of operating income, operating cost, period cost, assets devaluation, net income from the change of fair value, and net investment income. Net profit also called after-tax income. It is the profit retention after the company pays the tax according to tax regulations.

2.6 Raphael Amit & Christoph Zott's Business Model

2.6.1 Definition

The business model is a description of the connection between a firm and its external stakeholders. It also describes how a business organization involves in economic exchange to create value for itself and its partners. [31]

2.6.2 Component



Figure 7 Structure of Raphael Amit & Christoph Zott's Business Model

2.6.2.1 Resource

Resources are the asset owned and used by a firm to reduce the cost or increase its revenue. It is the most valuable property a business organization needed to make its business model operation.

2.6.2.2 Capabilities

The Capabilities refer to the ability of a business organization using its resources and value network to perform all the business activities to obtain core function.

2.6.2.3 Information Flows

Information flows in an organization consists of the following steps: data collection and data analysis, data collection.

2.6.2.4 Output

The final product or service a company provides to its customers.

2.6.2.5 Product Flows

Product flows in an organization consists of the following steps: raw material input, manufacturing process, and product delivery process.

2.6.2.6 Business Opportunities

Business opportunities refer to the explicit and implicit demands that have not been met or has not been fully met in the market. The typical business opportunities are shown below. [32]

- **Buying a franchise**
- **Consider a Distributorship and Dealership**
- **Network Marketing**
- **Licensing**
- **Find Your Niche and Fulfill a Need**

2.6.2.7 Create Value

Value can be created by differentiation and innovation. Differentiation can be realized by modifying the policy choices, internal and external linkages and series of business activities, while innovation needs a firm to introduce new technologies, new production methods, find new resources, reorganize traditional industries and create new markets.

2.6.2.8 Transaction Content

Transaction content refers to the exchangeable stuff and information. It is also involved the resources and capabilities that should be used during the exchange process.

2.6.2.9 Transaction Governance

Transaction governance refers to how the units in a company control the resource, materials, information. Another function of transaction governance is to provide the legal assistant.

2.6.2.10 Transaction structure

Transaction structure refers to the units that involved in the exchange process and the connection between these units.

2.7 Literature Review Summary

After the literature review section, it is evident that there is a diversity of the business model definition and structures. But among all the business models there is a common characteristic that most of these structures have hierarchical construction, and components are not isolated from the entirety but interact each other. The interaction makes the whole business model work as a whole to create, capture and deliver value to the customer. The hierarchical construction also makes it easier to detect and modify when the business model goes wrong

Besides, some authors argue that a business model can only be used in a particular industry or even only suitable for a specific firm, that is because of the situation of different companies are distinct. A business model can only cope with a particular business organization and with the change of market and economic environment, the business model may be no longer applicable, that is the reason why we need to transform the business model for SMEs in Norway in Industry 4.0 Era. It leads to a result that although some components in different business model structures have a common or similar name, the meanings are entirely different. For example, as Jane Linder's business model concentrates on E-business, so in the component "revenue model", the author emphasized that E-business firms need to generate revenue by providing an advertising platform or service to its customers. But for manufacturers, the revenue must be obtained by selling their product, which gives me a hint that during the design process of my business model for the small and medium-sized manufacturers in Norway, the market environment and series of factors must be considered.

The literature also suggests that when making a business model, you cannot isolate your target firm from its partners. Components in a successful business model are always connected with external factors, e.g. the value network component in Scott's business model involves internal organizations and external suppliers, even the relationship with competitors needed to be considered. A broader and comprehensive view can make the business model more applicable and efficient.

3 Business Model Proposal

In this section, I put forward a new business model and discuss the chosen components based on the business model literature. I separate this section into three segments: the first level of the business model, the second level of business model and the connection between different components, in each part I will explain why these components are chosen and then propose my own structure of the business model.

3.1 Study on the First Level of Business Model

According to an investigation on the state of business model innovation, until 2015, the innovation and adaptation of business model in Norway mainly happen in four dimensions: Customer Segment, Value Proposition, Value Capture and Value Delivery. [33]

For manufacturing industry, most of the innovations happened in value proposition sector. It is also the research emphasis with about 41% manufacturing enterprises innovating in this dimension, about 24% manufacturing firms decided to adapt the existing value proposition model, the remaining 35% have no changes in this aspect. The second most innovation happens in customer segmentation dimension, about 15% manufacturing firms choose to change their target customer, 30% decided to develop the existing customer segment further, and 55% remain unchanged. In value delivery aspect, there is almost no innovation in the manufacturing industry, half of the manufacturing firms choose to transform their existing value delivery network and the other half maintained the status. The least amount of change happened in value capture dimension, about 75% firms remained unchanged, 20% adapted the existing value capture model, and only 5% had a revolution in this sector.

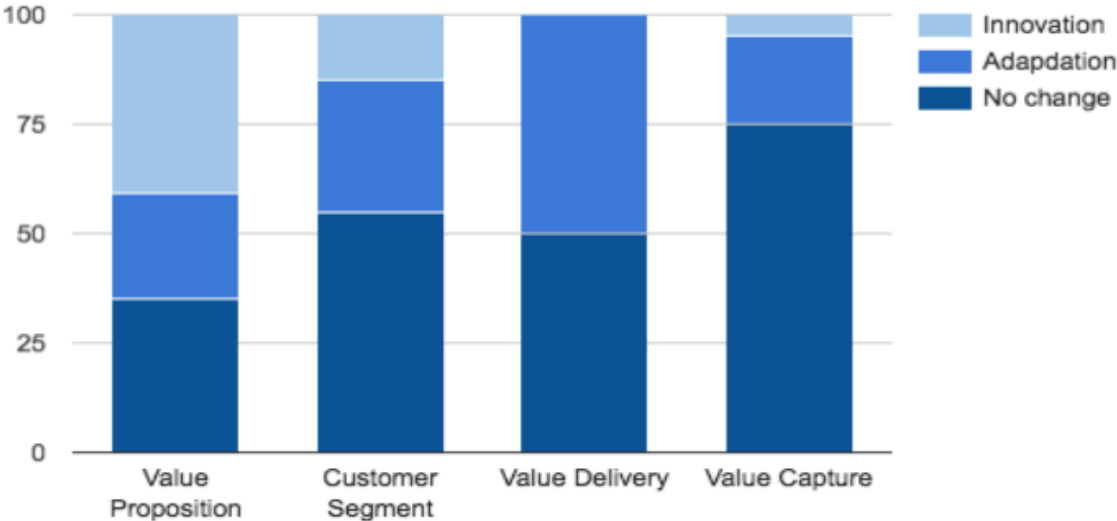


Figure 8 Current Situation of Business Model Innovation

Besides, Value Proposition, Customer Segment, Value Capture and Value Delivery also have the highest frequency of occurrence in the business model literature I study before. Hence, these four components consist the first level of the new business model. And then I move on to the second tier.

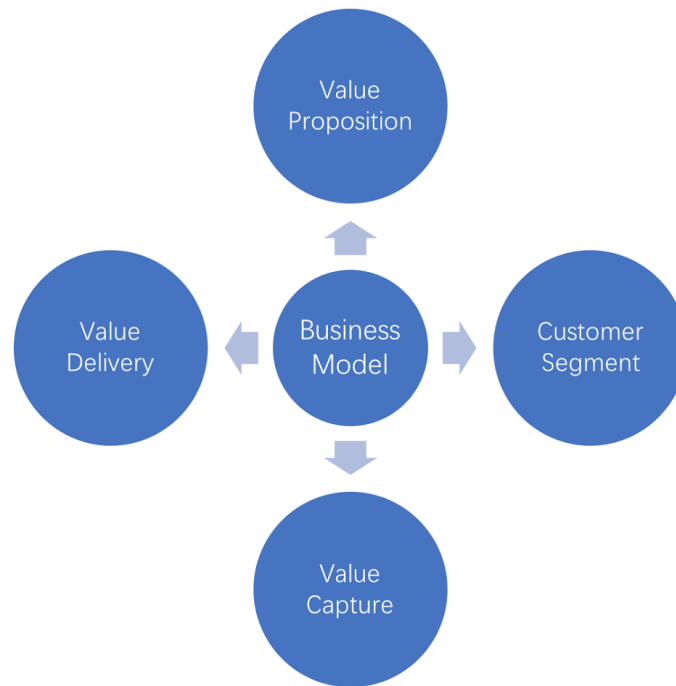


Figure 9 Structure of First Level of Business Model

3.2 Study on the Second Level of Business Model

3.2.1 Customer Segment Model

In order to design a suitable business model for a specific firm, the most important thing is to build up a product that attractive to customers, and the first step of creating a popular product is to target a market that has a large number of valuable customer. The literature suggested that the client can be segmented by characteristic while some other authors argued that the value of the customer to the enterprise is the critical factor to segment the client. In this paper, I suggest that for SMEs in Norway, both of the two methods should be used. Manufacturers need to take customer lifetime value (CLV) method into account. [34] The whole customer segment process can be divided into three sub-process: customer classification process, customer value evaluation process, and customer segment process.

3.2.1.1 Customer Classification Process

In customer classification process, for small and medium-sized manufacturers, there are three aspects worthy of their attention: demographic characteristic, geographic characteristic, and purchase history.

First, firms should focus on the demographic characteristic of customers, such as gender, age, hobby, family structure, value orientation, income and so on. Demographic characteristic is the most commonly used factor to segment customers since it is easy to identify and distinguish. The second aspect needs to be considered in customer classification process is geographic characteristic. The location of the client will influence their culture, politics, traditions, etc., and all these factors will affect their purchasing behavior.

By collecting and analysis the demographic and geographic information, firms can have a clear understanding of their potential customers and find out which customer segment has the greatest purchase potential and largest amount of potential customer. For example, fish oil manufacturers may classify their customers by age and location, since the function of fish oil is protecting cardiovascular

system and prevent seasonal affective disorder caused by polar night, compare with the youth, seniors have the greater purchase potential. Besides, people who live in Arctic Circle may have higher demand than others. Firms should note that the customer group with greatest purchase potential may not have the largest amount of potential customer.

The third aspect needs to be considered in customer classification process is purchase history. Purchase history shows the customer's cognition of a specific kind of product and can help companies infer customer's future purchases. [35] To have a complete understanding of customer purchase history, companies need to gather the information about whether the customers have purchased the similar product, associated product, or even have purchased a rival product from competitors.

By analysis customer purchase history, companies can know the customers' purchasing demand and purchasing capability, then select the customer group that already have knowledge about your product. The customer who has the purchase experience of the same or similar product and gets benefits from it has the greater possibility to pay and the cost of marketing can be saved significantly.

These three kinds of characteristics of the customer can help firms classified their customers into different customer group, but these groups still not accurate enough for companies to make various targeted Marketing strategies.

3.2.1.2 Customer Value Evaluation Process

After gathering and analysis the client's information from the three aspects, firms can move on to the client value evaluation process. In this process, based on customers' demographic information, geographic information and purchase history maintained above, firms need to measure three kinds of customer value: customer current value, customer potential value, and customer loyalty.

Customer current value refers to the how much profit a customer group can contribute in a given period, by utilizing the purchase history information collected in customer classification process and series of mathematics, current customer value can be figured out.

For manufacturers, customer potential value refers to the value a customer group can provide in the future. By forecast customer's future purchase behavior based on the analysis of demographic character, and geographic character mentioned above, the customer potential value of a specific customer group can be figured out.

Another factor needed to be considered in customer value evaluation process is customer loyalty, customer loyalty will be influenced by the quality, price, and service of product, and will determine whether a client group has repeatedly purchasing desire and activities for a specific product in a long duration.

3.2.1.3 Customer Segment Process

Based on their business emphasis and different product, companies can evaluate their customer according to the three aspects mentioned above, then classify them into four categories: top customer, big customer, medium customer and minor customer. As the capital and resource of a firm are limited, top and big customer group should be focused on and service first, while companies also need to pay attention to the medium and minor customer.

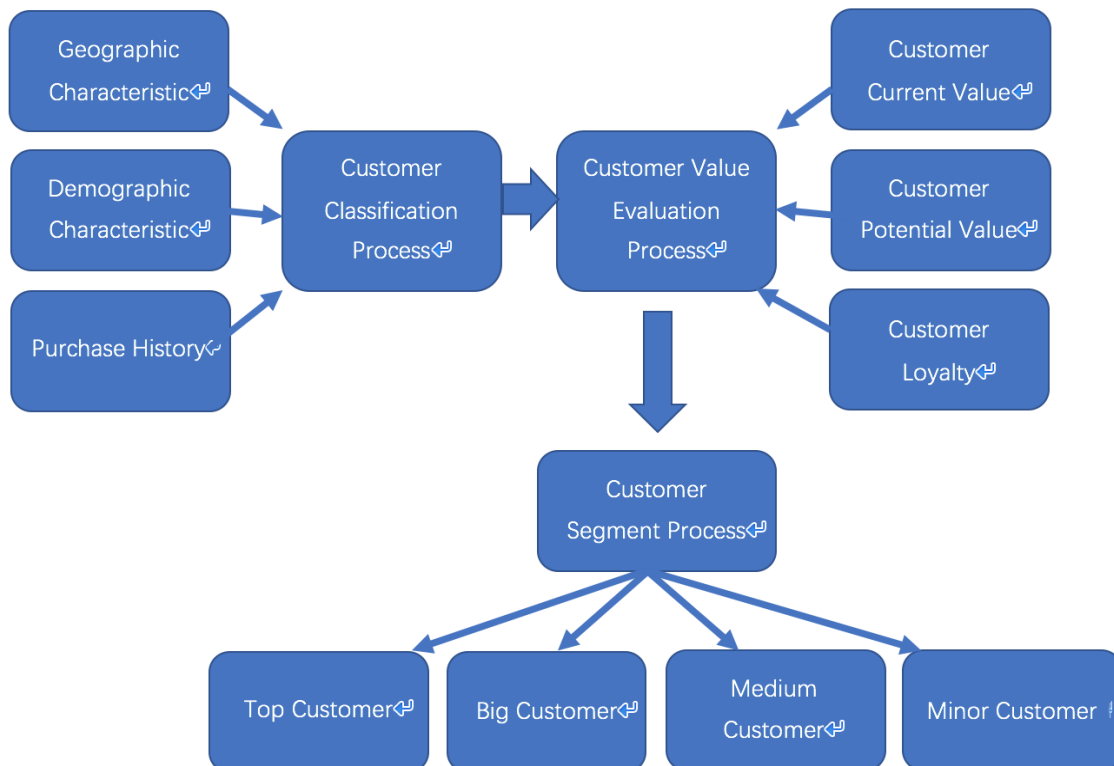


Figure 10 Structure of Customer Segment model

An excellent customer segment can help firms to make marketing strategies, modify value proposition, and reduce cost. It is worth noting that the markets and clients are constantly changing, the business value and criticality of the customer are change with time and other factors. Firms should take market changes into consideration and modify the customer segment from a dynamic perspective.

3.2.2 Value Proposition Model

From the literature review part, I have noticed that value proposition is considered as the foundation of a business model, it determines how a company orient itself in the market and the value it provides to the customers. According to the method put forward by Rosser Reeves in 1950s, value proposition can be divided into two parts: unique selling proposition (USP) and unique value proposition (UVP).

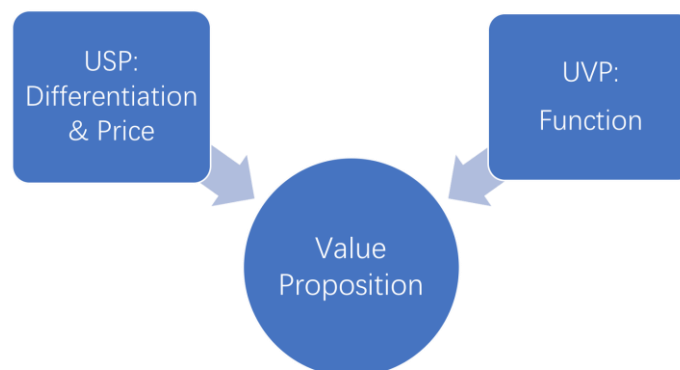


Figure 11 Structure of Value Proposition Model

3.2.2.1 UVP

UVP is more about what kind of problem a product aims to solve. In the fish oil case, the motive of customers' purchasing is health care or avoid depression caused by polar night. So, the UVP of fish oil firms are "Health Care" and "Anti-depression." As most of the small and medium-sized manufacturers in Norway focus on primary production and because of the economic and natural limits, in most industries the product of same type enterprises is similar and hard to provide a bundle of brand new product. Thus, the Literature suggest for small and medium-sized manufacturers, USP can be achieved by offering differentiation and providing a more attractive price. SMEs in Norway should make full use their regional and cultural characteristic to make their product stand out. While in the UVP aspect, as small and medium-sized manufacturers are in different industries and their product are diverse from each other, UVP of each firm should base on comprehensive understanding and research of their product.

3.2.2.2 USP

UVP makes companies understand what values they can provide to the customers, while USP help firms beating the competition in the competitive industry and win the market. USP is the unique characteristic that your firm provide to the target customer compare with your competitors, in another word, it is the reason why the clients prefer your product rather than your competitors. It can be "high quality," "fast delivery," "good service" or all the character that can make you product stand out of the crowd. Back to the fish oil case, there are numerous fish oil firms in the world, but Norway's fish oil has the best reputation, that is because Norway's unique geographical location and natural resource make Norway's fish oil is superior in quality. So "high quality" and "Pure" is the USP of Norway's fish oil manufacturers. Many publications in business give the suggestions to guide companies developing their unique selling propositions which comprise the following steps [36]:

First, manufacturers should have a deep understanding about their knock- out product which has the largest potential to help to generate profit. Investigate the features of their own product and competitors', and then compared. Manufacturers also need to take a survey among the customers to detect why they use this kind of product.

Next, manufacturers need to transform these "features" into "benefits," that is because of customers do not really care what features a product has, they care about what kind of benefit they can get by purchasing the product. Manufacturers can list all the features down, such as reasonable price, high quality, fast delivery, and technical or functional characters. Then find the suitable words to convert these features. For example, "high quality" can be described as "durable and reliable for long-term operating," and "multifunctional" can be regarded as "one purchase for multiple functions to save money."

The third step is to pick up the UVP from the benefits list. Manufacturers could score different kinds of benefits according to the unique and profitable level. The benefit which scored the highest is the UVP that small and medium-sized manufacturers seeking for. It is worth noting that, manufacturers also need to score the benefits that the competitors provide to the customer to find out their UVPs. It helps the manufacturers analysis whether they have the ability to defeat their rivals to provide a similar but much better USP to the customers, or develop a brand new USP that no one has provided before.

The final step is to convey the USP to the client, involves packaging, advertising, and other marketing knowledge. In packaging aspect, the manufacturers can communicate the USP to the customers by developing a creativity logo to enhance its brand character, or emphasize the USP on the package

directly by printing the origin of raw material, the unique production technologies and all the features that can highlight the USP on the packaging box. In marketing aspect, by advertising in the TV, websites and billboards, and printing product pamphlets on the magazines, manufacturers can make the customers have a clear understand of their product and the USP that they want to convey. The specific process will not be discussed here.



Figure 12 Development process of UVP

Manufacturers should note that as the change of market and customers needs, the present USP may be outdated and inapposite for the product, although the companies should not change their USP frequently, it is important to keep it perpetually fresh. To avoid eliminating by the market, manufacturers need to keep a watchful eye on the change of trends and analyze the competitor's activities timely.

3.2.3 Value Capture Model

During the literature review process, I noticed that most of the authors would like to put some components that relate to value creation together. In this paper, I draw on their previous experience to place “Resource Model,” “Pricing Mode” and “Cost Structure” together to consist a new component called “Value Capture Model.” For manufacturing companies, the goal of value capture model is to create economic value that equals to the difference between the price that paid for its product and the production cost, in another word, it is called added value. The cooperation and coordination among the three sub-items make the firm able to maximize the added value by optimizing the allocation of resource and the optimization of the pricing model and cost structure.

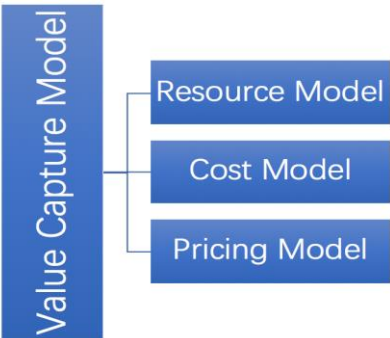


Figure 13 Structure of Value Capture Model

3.2.3.1 Resource Model

Almost all the business models in the literature review part put great importance on resource model, especially for manufacturers, the resource is the fundamental of production and sales process. Based on

the literature research and my study, according to whether it is visible and can be measured in monetary or not, the resources can be categorized as the tangible resource and intangible resource.

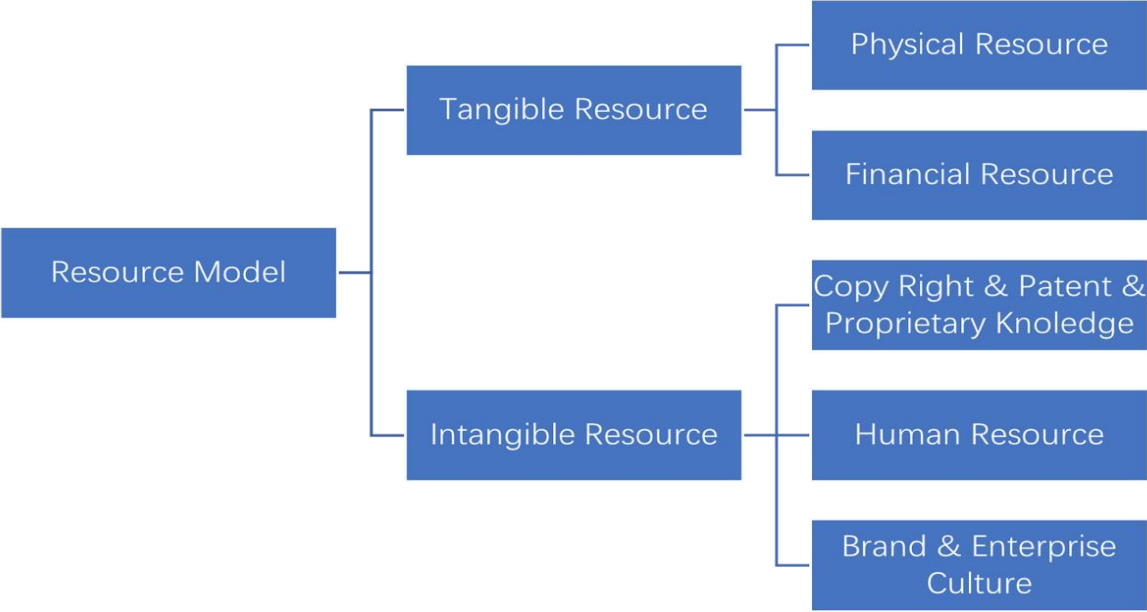


Figure 14 Structure of Resource Model

The tangible resource refers to the resources that visible and can be measured in monetary, includes physical resources and financial resources. Physical resource involves different physical properties owned by firms, such as manufacturing facilities, land, buildings, office items, software and vehicles that used in the distribution network. On the other hand, financial resources refer to the funds owned by the firm itself and loans from banks that can be utilized as a means of production or for investment. For manufacturers, the tangible resource has a tight connection with partner network and cost structure, the purpose of using the tangible resource is to improve the assets return rate. First, firms can improve the resource utilization efficiency by application of advanced technology. Second, by co-operating with partners, especially enhancing the connection with suppliers, manufacturers can better utilize the resource and reduce the cost. For instance, for fur farms in Norway, the fodder is one of the primary resources, by the utilization of advanced feeding system and the cooperation with a fish-processing plant to use their production waste: fish guts, as fodder, the cost of resource can be successfully reduced. Meanwhile, the utilization of resource will also be improved.

The intangible resource includes copyright, enterprise culture, proprietary knowledge, human, patents, customer, brand, and all the necessary input to create value. [37] For companies, especially manufacturers in the developing stage, intangible resources are indispensable. But most of the small and medium-sized manufacturers failed to pay attention to it.

From the development view, manufacturers should set up a special department to manage the human resource, not only the workforce but also the expert team that helps firms manage production, delivery, operation, and communication process. Besides, manufacturers also should attach importance to utilize and protect their patent, proprietary knowledge and copyright to optimize the production process. Last but not least, manufacturers should focus on cultivating their brand culture and enterprise culture to enhance their value proposition and develop the loyal customer base.

3.2.3.2 Cost Model

According to the function and process, this section can be separated into three parts: cost structure breakdown, cost reduction, and recycling economy.

Cost structure breakdown

In Scott. M. Shafer’s business model, component “cost structure” has been sorted in value capture section, and suggested by the literature, according to whether increase with the quantity of product cost of firms should be divided into two sub-components: Fixed Cost and Variable Cost. But it is just the basic cost classification and may not the best possible for manufacturers, after incorporated Scott’s idea and the cost the product life cycle theory. [38] I proposed a new cost breakdown structure for small and medium-sized manufacturers.

First, to help small and medium-scale manufacturers to distinguish which types of cost increase with the product quantity and can be reduced by controlling the production process, I considered Scott’s idea and separated the total cost into two main categories: Fixed Cost and Variable Cost. After that, based on the understanding of product lifecycle cost (LCC) theory, under both of the two main categories, I sorted different types of cost into four subcategories: Product Development & Design Cost, Production Process Cost, Operation Cost, and Product Maintenance Cost.



Figure 15 Lifecycle of Product

In Product development & design phase, the cost is incurred by the development and application of new techniques, new products, and new technologies, includes product planning cost, product research cost, design cost, product software fee, and product test & evaluation cost. As almost all the cost in this phase have no correlation with product quantity, all these costs are sorted into the “Fixed Cost” category.

In the production phase, the cost is considered as the majority of the total cost for manufacturers, include all the cost involves production and procurement process, and the resulting social responsibility cost. In this phase, most of the expenses are connected with the manufacturing process and increased with the product quantity. Such as the manufacturing cost (labor cost, raw material cost, etc.), quality control cost, production maintenance cost (preventive maintenance cost, reactive maintenance cost, custodial cost, repair cost) and waste disposal cost. These costs can be classified to “Variable Cost.” While other types of production process costs, for instance, factory construction cost (land rental fee, building cost,

etc.), manufacturing/construction management cost, manufacturing facilities cost (facilities rental fee, facilities purchase cost), manufacturing & production maintenance training fee should be classified as “Fixed Cost.”

In product operation phase, the cost can also be divided into two kinds. “Fixed Cost” category contains product operation cost (operation planning cost, business development cost, advertising fee, event marketing cost, data analysis cost and market monitoring cost, etc.), operator training fee, technical data cost, fixed cost of distribution facilities, and product modification cost. While in “Variable Cost” category, there are inventory cost and product distribution cost.

The last phase of the full lifecycle of a product is the maintenance phase, product maintenance cost related to the costs caused by the product maintenance service (training, parts replacement fee, etc.), also includes the disposal expenses incurred by product retire, and the disposal of the unrepairable product. As the amount of faulty and unrepairable product increase with the quantity of product, I classified these three kinds of costs into “Variable Cost.” Besides, serviceman training cost should be classified as “Fixed Cost.”

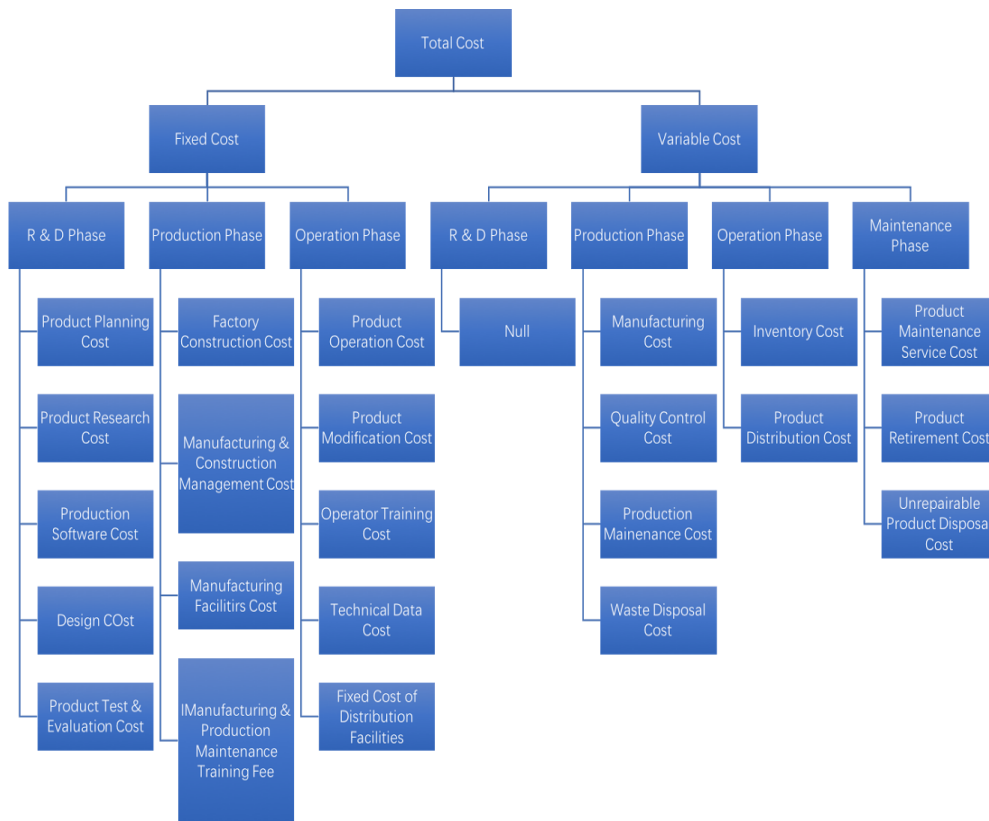


Figure 16 Cost Structure Breakdown

Cost Reduction

Cost reduction is the goal of cost structure analysis. After cost structure breakdown process, manufacturers should use series methods to reduce different types of cost in each phase of a product’s life cycle. As most of the fixed costs are difficult to reduce, the object of this section is to discuss how to reduce the variable cost.

In product research and develop phase, the communication between R&D department and other departments can contribute to reducing the cost in different lifecycle phases dramatically. First, to reduce the production cost, R&D department need to negotiate with product department to design a product with low manufacturing difficulty and less material consumption. Second, to develop a fully functional and competitive product that responds market demand to reduce the potential operation cost such as inventory cost, R&D department should have a clear understanding of the market situation, customers' demand and the product's value proposition. After the development process, firms should perform feasibility analysis to measure the product's competitiveness. All these actions need the cooperation with the marketing department. In order to reduce the cost in the maintenance phase, R&D department needs to pay attention to the product's quality and durability during the design and development process to avoid the potential problems cost by defects and quality issue. For example, R&D department of a small-sized furniture factory needs to design a new kind of chair with minimum amount material and essay to manufacture. On the other hand, this chair should have enough traction to customers to get a significant market share and avoid the unsalable situation. Last but not least, the quality of this type of chair should be more than adequate to reduce the return and exchange rate. Overall, the research and development phase has the greatest potential for cost reduction, and it is based on information exchange. The cost of developing the new product is always high, that is because it is the core of market expanding and innovation.

In the production phase, the transformation of product idea into physical reality also has the potential of cost reduction. First, by utilizing advanced manufacturing facilities and system, the consumption of raw material and labor cost can be reduced significantly. By control the manufacturing process, production phase can also help to reduce the operation and maintenance cost. As the inventory is based on the sale performance and the volume of production, a proper production plan can assist in cutting the inventory. For maintenance phase, by utilize advanced facilities and system, and strictly control the manufacturing process, the production accuracy can be improved significantly, the frequency of defective and unrepairable product can also be reduced, in this way, the maintenance cost can be lowered.

Nowadays, product operation is playing an increasingly important role in obtaining and maintain product competitiveness. Firms always inject a significant amount of investment into operation department to grab the market. By make appropriate operation strategies for products in the different phase of the lifecycle, firms can reduce operation cost and increase their marketing effect. For the product at the start-up stage, advertising should be paid more attention, and for the product that already have a certain market share, firms can moderate advertising expenditures. Utilization of advanced operation platform is another way to reduce the operation cost, compare with holding a product exhibition, operate or rent a website with the good reputation is much cheaper and more efficient. In distribution aspect, to reduce the cost and loss caused by transportation, manufacturers should find customers or retailers at an appropriate distance. For timeliness product, the distance between manufacturer and customer should be as short as possible.

To make the customer satisfied and maintain competitive in the market, manufacturers should put a high value on product maintenance phase. There is not much potential for cost reduction in this phase, but by enhancing the data collection and information summary work, and the communication with other departments, firms can reduce the maintenance cost, the life cycle of the product can be lengthened.

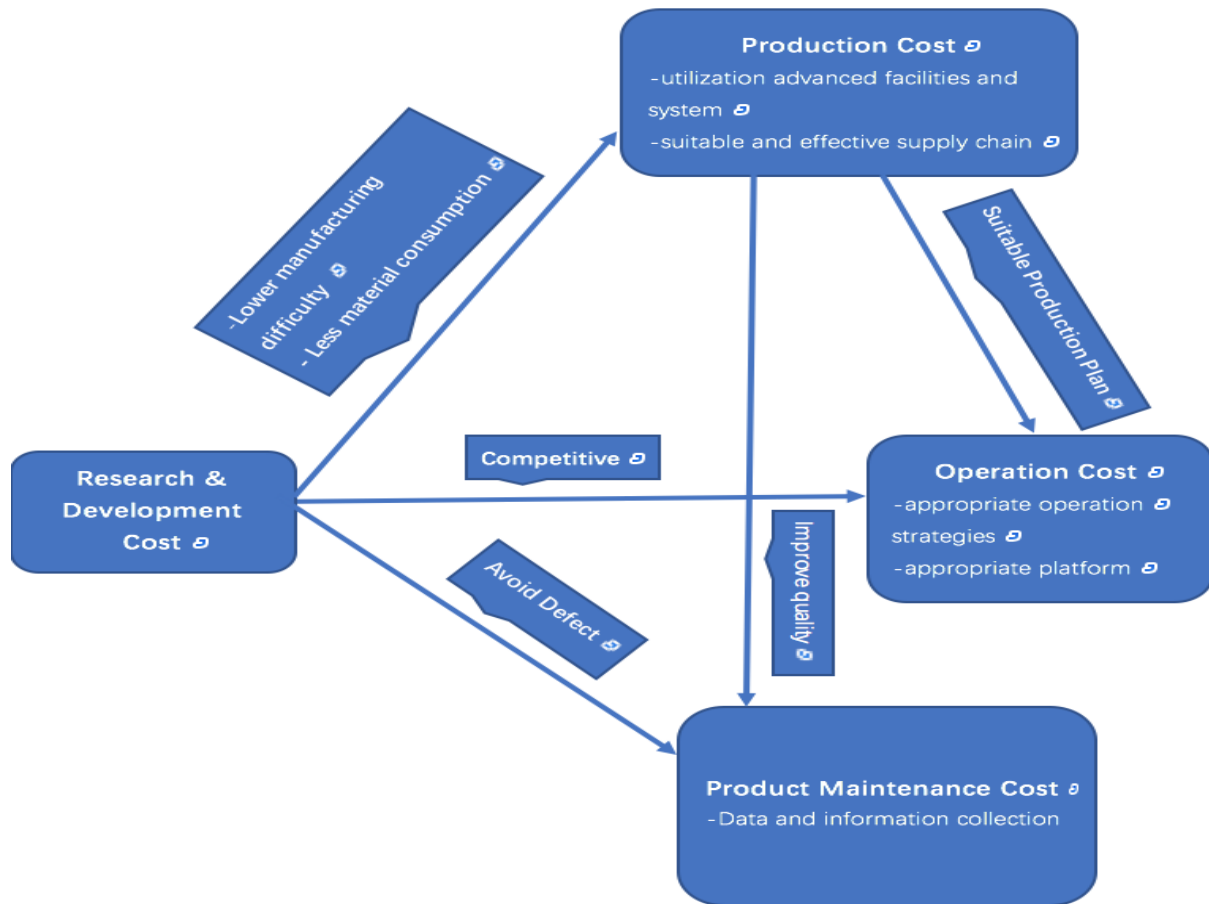


Figure 17 Cost Reduction

Closed loop supply chain and recycling economy

Manufacturers should note that, besides the points mentioned above, by establishing a closed loop supply chain and utilizing the recycling economy method, the raw material input cost, manufacturing energy cost, and waste disposal cost can be significantly reduced. Closed loop supply chain refers to an integrated supply chain loop contains product recovery network and reverse logistics. Its focus on recovery the elimination products and defect products from customers, then use the value by reusing the entire product or disassemble the product to reuse the components. [39] To make full use the residual value, manufacturers need to set up a return processor to sorting and analyzing the products that recovered from the customers according to the product damaged condition. For the repairable product, manufacturers can provide a free or for-purchase maintenance service. Technician communicates with clients through telephone or the Internet, with customers' content, the technician can make the departure to provide on-site service or ask the customers to send the defect product to the repair sites. For the elimination products, if the degree of aging and wearing are acceptable, after ensure there are no major quality problems, the return processor can send it to the retailer or distributor and resell them to second-hand buyers. For the severely damaged products or the products with serious quality problems, return processor need to send them back to the manufacturers to remedial remanufacturer or dismantle the products to recycle the parts and materials. For the substantially damaged product and worthless components, the return processor can send them to the waste disposal process directly. Besides, the return processor also takes the task of collecting product information. By analyzing the recovered product, the return processor can find out product defect and quality problems,

then report the information to the R&D department to help product improvement and production process optimization. The R&D also need to optimize the product design to use more recycled material and detachable components, to increase the recovery rate and reduce the difficulty of recycling. The closed loop supply chain gives the manufacturers a new way to disposal the defect and elimination products and decreases the waste disposal cost. On the other hand, by detaching the defect product and reuse the components, manufacturers can lower the material resource cost.

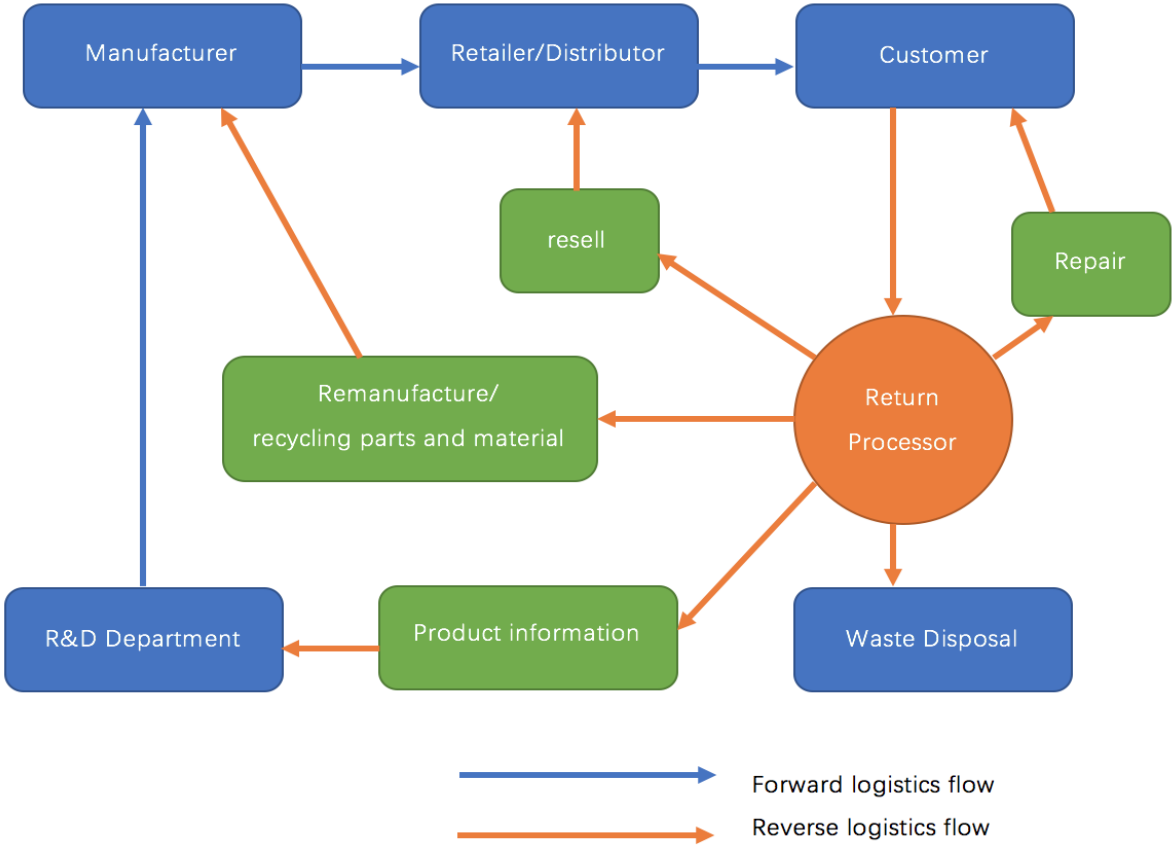


Figure 18 Closed loop supply chain

The recycling economy suggest that the manufacturing residuals can be classified into four categories: by-product, spoilage, waste, and scrap. [40] Most of the manufacturing residuals can be considered as wrong placed resources. Except for hazardous and worthless waste, all the other kinds of manufacturing residuals can be used to reduce the cost or generate profit. In the cost model section, the focus is the cost reduction aspect, the profit generation aspect will be mentioned in the revenue model section. To reduce the raw material cost and energy resource cost, manufacturers can have cooperation with upstream firms to purchase their manufacturing residuals as feedstock and/or energy resources. As the example mentioned in the resource model section, the cooperation between the fur farm and fish factory, solve the fur farm’s fodder input problem and reduce the feed cost, at the same time, fish factory’s waste disposal problem has a perfect solution. On the other hand, for some manufacturers, recycling the manufacturing scraps and by-product that from their own production process as the raw materials or energy resources is an efficient way to reduce the total cost and waste emission. For the defect product, manufacturers have two options: reworked & sold, scrapped, or wasted. That depends on the degree of inferiority and the cost. The hazardous waste and worthless waste needed to be disposal in an appropriate way to avoid the excessive waste disposal cost and environmental pollution.

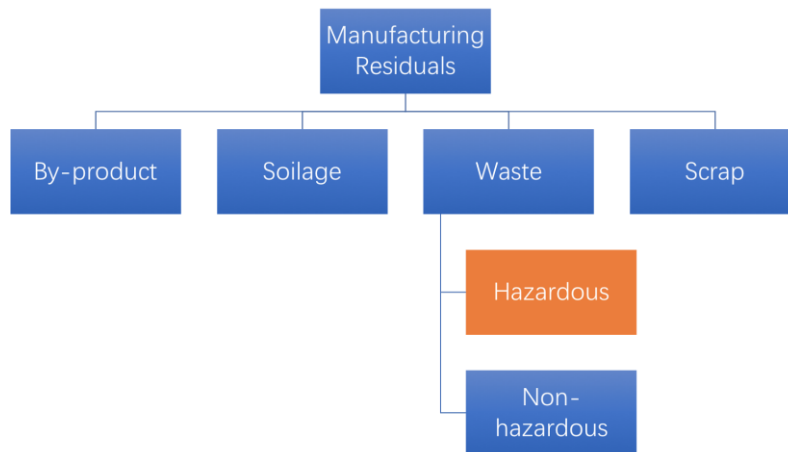


Figure 19 Classification of Manufacturing residuals.

3.2.3.3 Pricing Model

According to some theories in literature review part, different types of pricing method can be sorted into three broad categories: cost-based pricing, demand-based pricing, competition-based pricing. For most manufacturers, the cost-based pricing strategy, especially the cost-plus pricing strategy is considered as the most widely used pricing method. From my point of view, by introducing the product lifecycle (PLC) theory, all the three kinds of pricing method mentioned above are needed while construct the pricing model for small and medium-sized manufacturing firms to help them grab market share and obtain competitiveness.

Identical to the pricing model of other researchers, I used the cost-plus pricing method as the basis of my new pricing strategy. Cost-plus pricing method is a price setting strategy that adds all the cost of a product together and then adds a certain markup percentage to it to get the price of a product. [41] The pricing formula is shown in figure XX.

$$\frac{\text{total cost} + \text{markup}}{\text{number of product expected to sell}}$$

Figure 20 Pricing Formula

According to the cost breakdown model I put forward in the cost model section, the total cost of a product can be estimated while firms make their pricing strategies, but the markup part still needed to be determined. As manufacturers provide more than one kind of product and the lifecycle of the product is finite, product lifecycle theory can help SMEs to develop suitable pricing methods for diverse products in different lifetime stage.

Raymond Vernon in 1966 devised product lifecycle theory, and he suggested that the whole lifetime of a product, from first approaching market until it eventually eliminated by market force, can be divided into four stage: introduction stage, growing stage, maturity stage, and decline stage. [42]



Figure 21 Product Lifetime in Market

In introduction stage, while determining the markup part of the total price, competition-based pricing method can be taken into considering. For the product in this stage and aims to improve market share, after consider about competitors' pricing strategy, firms can price their product higher, lower or even equal to rival product. In order to let the customers notice their product and lure them away from the competitors, the most efficient way is to provide a lower price than their competitors in the market, this strategy is referred to penetration pricing. [43] Penetration pricing strategy can help product enter the competitive maker and boost sale. But a lower price and a comfortable profit margin are often conflicting with each other, to solve this problem, manufacturers needed to find a solution in the cost model section. By increasing the production, although the total material consumption is increased, bulk purchasing also reduce the raw material cost of per unit. Besides, as the quantity of product is increased, the overall management and operation cost can be apportioned to more units. In this way, the balance of low price and appropriate profit can be achieved.

In order to take advantages of competition-based pricing strategy, there are several steps needed to follow: First, manufacturers should have a briefly understanding about the quantity of competitors in the local market, the size and the location of them. Location of competitors will determine the strategy you adopt. Penetration pricing strategy can be extremely useful when the competitor is bigger in size or the distance from you to the customer further than the distance between the client and your competitor. While in the opposite situation, just pricing same as the competitor is enough. Second, firms should have a clear understanding of the barriers to entry the target market, competitors' selling and pricing strategies, according to these factors, companies can modify their pricing strategies more suitable for local market.

While in the growth stage, the product has already entered the market. To increase the market share percentage, enlarge the customer base, and raising the level of brand recognition, competition pricing method is still needed. In this stage, D&R department needs to provide more support, as firms always choose to modify and improve the quality of their product according to previous customer reviews. [44] The successful utilization of operation and pricing strategies in the previous stage led to a sustainable growth of demand. An efficient distribution network is needed to respond the situation. For the foregoing reasons, the cost will increase, but to attract and retain as many customers as possible, manufacturers should remain the price stable, pricing same as the competitor is a good choice. For the product in maturity stage, there is a significant change in the market situation. With the emergence of the new rival product, the competition becomes fiercer, and the sale starts to wilt. In this stage, the customer becomes more important than the competitor in the pricing process. Companies should use demand-based pricing

strategy to support their product value proposition and product image. For those companies who provide high-end and high-quality product, a higher price will attract more prestige-oriented customer, while supplier of cheap goods should use a lower price to lure bargain seekers. In this lifecycle stage, in order to refine the customer base and earn more profit, firms should price and modify their orient strategies according to their customer segment. The last stage of the product lifecycle is the decline stage, to destocking, various demand-based pricing strategies are adopted. At the beginning of decline stage, by using volume pricing strategy, firms may offer a discount to large volume buyers to catch their attention and increase sale. At the end of the product lifecycle, to give a boost to inventory disposal, manufacturers may price a large bundle of product to give customers an added incentive to purchase.

By combining the product lifecycle theory and different pricing strategies, small and medium-sized manufacturers can help their product to create and ensure the sustainable competitiveness in the market. In order to choose the most suitable pricing strategies in the different stage of the product lifecycle, firms need to be sensitive to the change of the market and competitors' activities and trends. In the other hand, companies also need to pay critical attention to the desire and demand of the customer.

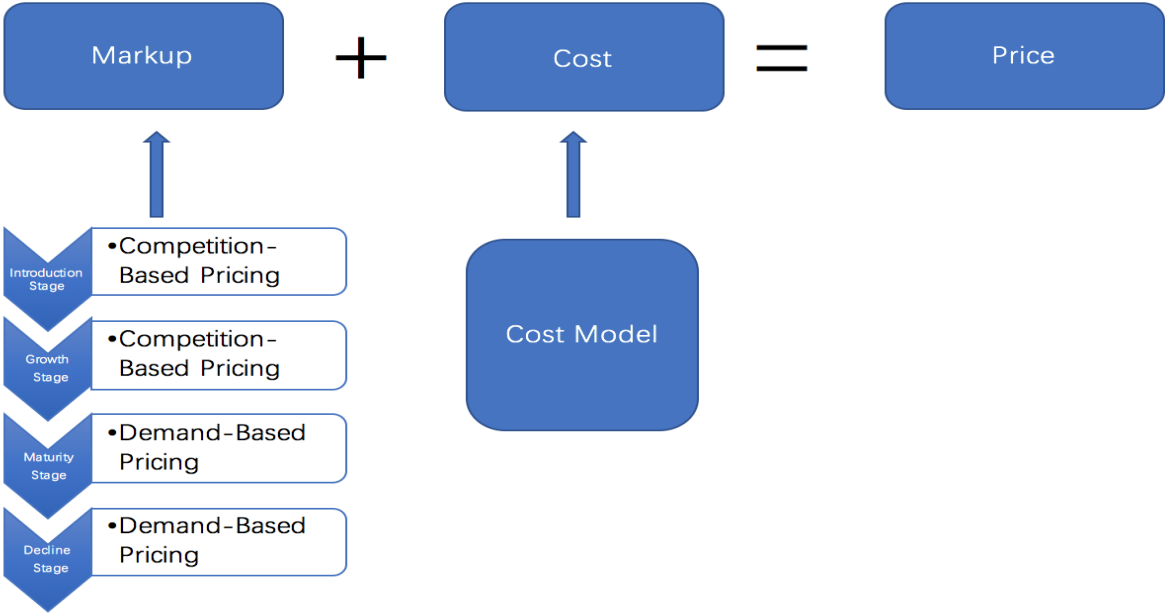


Figure 22 Structure of Pricing Model

3.2.4 Value Delivery Model

Value Delivery Model also known as supply chain, refers to the extension of value capture model. To create value and then deliver it to the customer, only by using an isolated firm's internal value chain is not enough, companies also need to generate value from its suppliers and deliver the value to customer or retailers after production. The whole process can be regarded as the integration of the value chain of the different business organization. [45] For a manufacturer, value delivery system not only involves the firm itself, but also the other business organizations and individual such as suppliers, retailers, and customers. It focuses on the transmission process of a set of logically related value. The goal of establishing value delivery system is to improve the final value that provided to the customer which also called customer value. But the customer value is just a part of the total value that the delivery process involved. If any node in this value delivery chain system is defective and cannot deliver the value it creates to the next node, it must cause the destruction in the whole value delivery chain, leads to a consequence that all the nodes in the system cannot get profit. After considered about the value network

component in Scott.M. Shafer’s business model, I placed all the component that related to value transportation together. As a result, my value delivery model consists partner network, channel model, and revenue model.

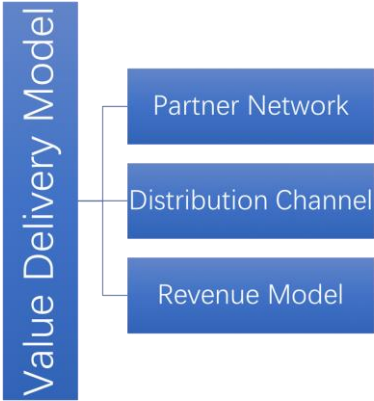


Figure 23 Structure of Value Delivery Model

3.2.4.1 Partner Network

Under the current economic globalization background, no firms can exist in isolation. For manufacturers, sometimes the partner network is even more important than the company itself. Inspired by Osterwald and Hedman’s business models, in this paper I divide the partner network into four parts.

The first part is the buyer-supplier relationship, this part influences manufacturer’s production process, a stable and reliable supplier can ensure the product process remain stable and efficient, it also keeps the quality of product consistently high. For manufacturers, while choosing raw material suppliers, there are four factors need be considered. [46]

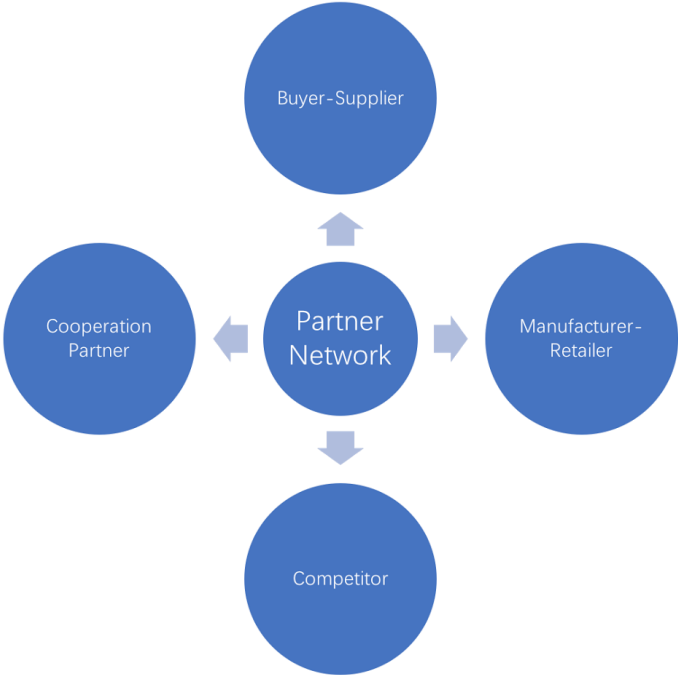


Figure 24 Structure of Partner Network Model

The first one is price, as small and medium-sized manufacturers' funds are always limited, that makes price become the principal factor when choosing which raw material supplier to cooperate with. The goal is to purchase the largest quantity and highest quality material with the lowest price. After price, the reliability is another key factor need to be considered while finding a suitable supplier, timely delivery, and supply goods in proper amount can make the manufacturing process stable and efficient. Big suppliers always have the best reliability, they provide a stable supply system that able to deal with the various situation, but their offers are always higher. Small suppliers are another choice, they often offer a much lower price, and manufacturers can always receive more attentions, but small suppliers are always susceptible to the emergency. So, the best solution for small and medium-scale manufacturers is building production system that relies on multiple suppliers to reduce the cost and avoid risk. The third factor is stability. There are no manufacturers want to change their suppliers frequently, a lack of tacit cooperation will decrease the production efficiency and reduce the value capture rate. The last factor need be considered is the location, for small and medium-sized manufacturers in Norway, this factor becomes particularly important. In the current situation, it is better to choose a suitable supplier nearby than a perfect distant one, because the distance will increase the transportation cost, reduce the supply efficiency and for manufacturers whose product with high timeliness, the value proposition will be eroded. For instance, a smoked salmon factory, a distant fish supplier will shorten the guarantee period, drop the quality and harm the image you present to the customer. To sum up, buyer-supplier relationship is the most critical one among the three aspects, manufacturers should be cautious in selecting suitable suppliers.

The second part is the manufacturer-retailer relationship, manufacturers can set up their retail shop or even sell their product online, but still need to cooperate with physical or online retailers in most occasions. The retailers can be regarded as a particular kind of customers, to choose suitable retailers and put your product on their goods shelf, there are several steps manufacturers should follow. [47] First of all, manufacturers should take a research and know the retailers from different aspects. Except for the price they offer and the distance between you and them, you should also consider whether the retailer has the successful experience of selling the similar product. In most cases, retailer's customer base will help your product to enter the local market, but the sales experience is a double-edged sword, it also means you have to share the market with your competitors. To grab the market share, you need to negotiate with your retailer and let them take you as a preferred supplier than their current one by offering them some benefit, such as a lower price than your competitors. The second step is to negotiate with the retailers about what volume they can purchase. It will affect manufacturers' production and inventory plan. An appropriate supply contract between manufacturers and their retailers can help them reduce the inventory cost and improve the value capture rate. The third step is sharing the information of the product and training the retailer, a good understanding of the product can help the retailer giving a better introduction of the manufacturer's value proposition to the final customer and help the product enhance the market share.

The third aspect of partner network is the competitor relationship. According to the literature read in the literature review part, competitors can be sort into four categories:

- Brand competitor
- Product competitor
- Generic competitor
- Total budget competitor.

And then according to how companies interact with each other, there are four types of competitor relationship [48]:

- Competition
- Coexistence
- Cooperation
- Co-opetition

The competition relationship is the most common relationship between competitors, it always appears between the manufacturers and its brand competitor or product competitor, as they provide almost same product to the same customer group, the confliction is acerb and difficult to be reconciled. Manufacturers need to fight with this kind of competitors for market share by providing a lower price or higher quality product. Coexistence relationship is another common relationship among competitors, especially among total budget competitors, as the product of them are different. So although there exists overlap market, these two kinds of competitors can always coexistence harmoniously. For companies, the most critical competitor relationships that they should pay attention to are the cooperation relationship and co-opetition relationship. Cooperation competitor relationship is considered as the most visible relationship between competitors. The cooperation is based on a common goal and interest, and cooperative parties distribute the resources and market share, negotiate and communication is needed when conflicts and disagreements occur. The co-opetition relationship is the most demanding and ideal relationship between competitors. There are competition and cooperation exist simultaneously. In cooperation part, firms share their resource and assets with each other, and in competition part, firms intercompare with each other's' product, customer orientation and other elements. This kind of relationship always exists between generic competitors. In conclusion, a clear understanding and classification of competitor relationship can help small and medium-sized manufacturers survival in the competitive market.

The fourth part is the cooperation partners. It refers to the intermediate distributors, transport companies, and pickup sites in local stores. These cooperation partners often involved in the distribution process of the product. By cooperate with reliable intermediate distributors and pickup sites, manufacturers can decrease the transportation cost, inventory cost and facilities cost substantially. At the same time, compare with providing delivery service by themselves, the cooperation with efficient and fast shippers can help manufacturers lower the transportation cost significantly and achieve high responsiveness and customer satisfaction.

3.2.4.2 Distribution Channel

As the partner network component focuses on the relationship between manufacturer and its suppliers, competitors, and retailers. The distribution channel concentrates more on how to build up an efficient distribution network among the supplier, retailer, the end customer, and the manufacturer itself. In this thesis, I separate the distribution channel into two parts: Sourcing Model and Marketing Channel.

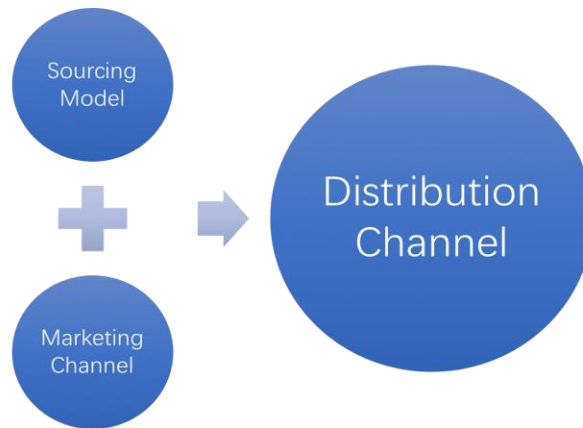


Figure 25 Structure of Distribution Channel

Sourcing Model

Sourcing, also known as purchasing, is the process that firms procure raw materials, components, products or other resources from suppliers to carry out their business activities. [49] For small and medium-sized manufacturers, sourcing mainly occurs between raw material suppliers/former components suppliers and the manufacturing firms themselves, and the majority of sourcing is raw materials and components. According to Sunil Chopra, before series sourcing activities, companies need to decide which components should be produced in-house or outsource to external third party suppliers. For raw materials and required components that with stable high demand and high labor content, outsource is a better choice. While for the parts that need high responsiveness, in-house production remains the best option. The sourcing process can be divided into five steps as follow.

- Supplier evaluation & selection
- Contract design & negotiation
- Design collaboration
- Material procurement
- Sourcing planning & analysis



Figure 26 Sourcing Process

The first step of sourcing model is supplier evaluation & selection. There are several characters needed to be considered while choosing suitable suppliers such as price, reliability, and stability. Details have already mentioned in the partner network section which is not repeated here for the sake of brevity.

The second step, in order to ensure adequate and timely supply, manufacturers need to establish the cooperative relationship by negotiating and sign the supply contract with suppliers. In standard supply contracts, the two parties should establish an agreement on the following aspects. [50]

- Price and quantity discount
- Minimum and maximum purchasing quantity
- Delivery lead time
- Material quality
- Material buyback policy

Literature suggests that when manufacturers establishing the partnership with suppliers, there are several major types of supply contract strategies to choose. According to the experience, firms always tend to sign long-term contract to keep long-term stable colleague relationship with suppliers. The long-term contract is also known as fixed term contract. It places an obligation on suppliers to provide a fixed quantity of raw materials within the stipulated time. As the buyer come to an agreement with sellers on the price and amount of raw materials, manufacturers will not assume the financial risk caused by price fluctuation. But as the market demand is uncertain and the order cannot be adjusted after the contract is signed, manufacturers will bear all the inventory risk.

With the trend of globalization and fluctuating market environment, an increasing number of companies turned to make a flexible option contract with suppliers. To transfer the inventory risk to the sellers, buyers need to pay some deposit in advance. But if the buyers' option is not exercised within the fixed time, the deposit will not be returned. By signing flexible contracts, manufacturers can have high flexibility to the market demand change, and mitigate inventory risks. But as the price in the market is fluctuating, the financial risk is assumed by the buyers. On the other hand, the total price in a flexible contract is always higher than a long-term contract.

Another kind of supply contract strategy is spot purchasing. Manufacturers look for multiple suppliers in the spot market to seek additional supply sources. Spot purchasing enables the raw material purchase process greater flexibility and dynamicity. Purchase quantity can be modified according to the changing market situation and demand. By using spot purchasing strategy, manufacturers can obtain the initiative, as the suppliers compete in the spot market, manufacturers can always purchase at a bargain price. But as spot market is complex and there is no long-term cooperative relationship between manufacturers and the spot suppliers, the quantity, quality, price, and supply safety of raw materials cannot be guaranteed.

For small and medium-sized manufacturers in Norway, the combination of different kinds of the contract which also called portfolio contract is needed. For the high quantity and long term demand materials, manufacturers should sign long-term contracts with one or two stable suppliers to ensure a steady supply, while the flexible supply contracts with several smaller suppliers and spot purchasing can make the supply of material more flexible and responsive to market change. To decrease the risk and maximum the profit, buyers need to make the most appropriate combination of low price & low flexibility long-term contract, lower price & higher flexibility option contract, and uncertain spot purchasing, according to their product and production. An appropriate portfolio contract can benefit both the suppliers and the buyers, and make the whole purchasing model more efficient.

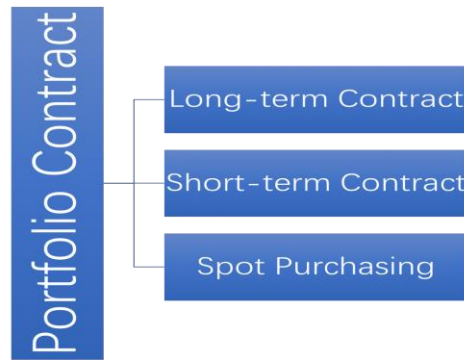


Figure 27 Portfolio Contract

The third step of purchasing model is design collaboration, as 80% of the purchasing cost of production is determined during the design process, design cooperation with suppliers can help manufacturers lower the cost of purchasing raw material and drastically reduce time to market. On the other hand, for manufacturers who lies its core in providing diversified and customized product, design cooperation can lower the manufacturing and logistics cost significantly. [51]

By sharing the design modification plan with affected suppliers, manufacturers can have communication and collaboration on the design emphasis. The focus of product design can be various in two types. The first category is design for logistics, the aim of design for logistics is to take appropriate measures to lower the transportation cost and inventory cost during product design process. Manufacturers need to notify their suppliers the expected order quantity of the retailers and final customers, while the expected order quantity is large, by notifying the parts suppliers using compact packaging method, lower transportation cost can be achieved. To reduce manufacturer's inventory cost, manufacturers negotiate with suppliers during the design process to transform their product into assembly modules that can be assembled. As all the parts inventory is stored as modules and the replenishment quantity is according to the orders from retailers and final customers, the inventory cost can be significantly reduced.

On the other hand, design for manufacturability is another point needed to be considered during design collaboration. The aim of design for manufacturability is to design the product to reduce the manufacturing difficulty and production cost, such as using standard components and replaceable parts instead of using particular parts.

Keeping regular communication with suppliers can help manufacturers modify their product design to improve the quality, competitiveness, and reduce the cost, time to market.

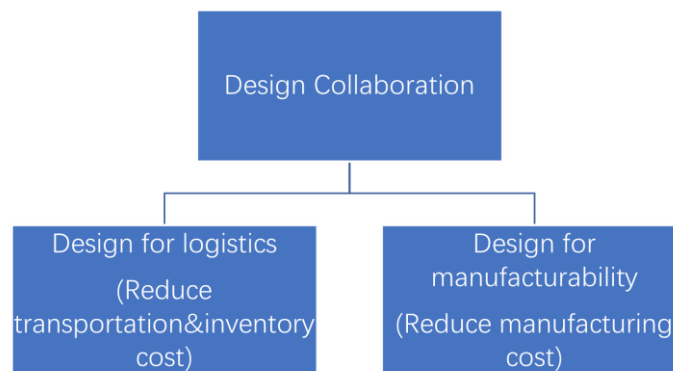


Figure 28 Two Aspect of Design Collaboration

After the appropriate suppliers have been chosen, the contract between providers and buyers has been signed, and the product has been designed, manufacturers can move on to the fourth step of sourcing: material procurement process. For manufacturers, material procurement process starts with the order placing by manufacturers and end by receiving material and paying for it. When making material procurement process, the goal is to ensure the suppliers can provide sufficient high-quality manufacturing materials to manufacturers at the right time and place when the demands occur. In order to achieve this goal, manufacturers should improve the coordination and visibility with their suppliers which embodies in two aspects. The first aspect is manufacturers should share the production schedule and raw material inventory status with them, in this way the suppliers can arrange their production and supply plan of materials according to the manufacturer's demand. The other aspect is the manufacturers also need to have a clear understanding of the production capability and supply ability of each supplier, then allocate the suitable order quantity to avoid delay in delivery.

The final step of sourcing is sourcing planning and analysis process, it is considered as a complement of the other sourcing steps mentioned above. Sourcing planning and analysis process aim to analyze different suppliers and design a most suitable tailored supply portfolio to achieve cost saving. As time goes on and the change of market, manufacturers should always analysis and evaluate the suppliers that have cooperated with before to respond to variations in the external environment and internal development. The balance of cost efficient and responsive should both be considered.

Besides, after the analysis of cost and responsiveness, manufacturers can re-decide whether to produce the required parts of final product in-house or outsource them to external third party suppliers. After evaluating the indexes, manufacturers can terminate the partnership with the poorly performing suppliers and look for better allies.

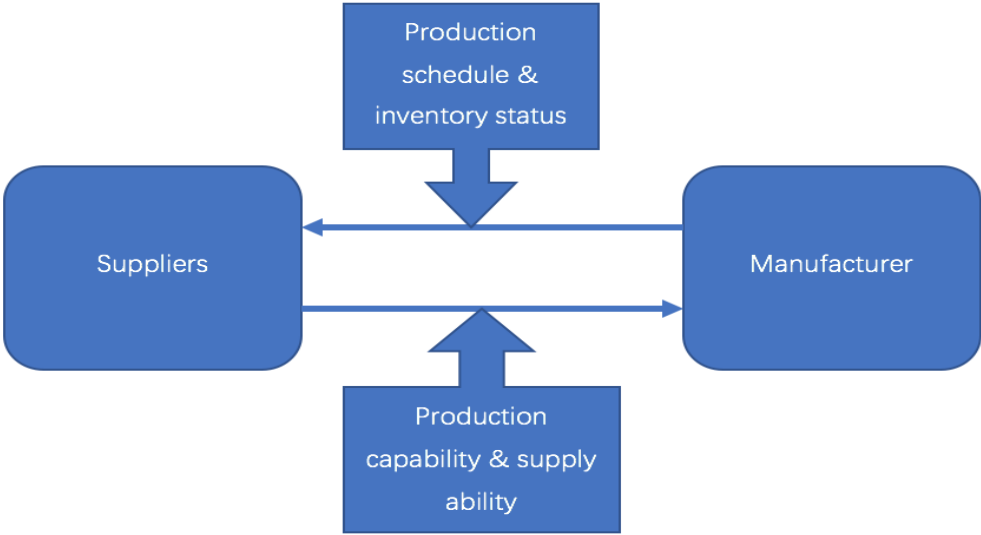


Figure 29 Information Exchange between Supplier and Manufacturer

Marketing Channel

Marketing channel also called trade channel refers to a series of activities that necessary to transfer the ownership of product from the manufacturer to the final customer and the distribution path between

them. [52] Marketing channel is a complete commodity circulation process that connected the manufacture and consumption. It contains two aspects: commodity ownership circulation and logistics, commodity ownership refers to the transfer of the ownership of the goods while the logistic focus on the transportation of physical commodities. By utilizing appropriate marketing channel, the customer can choose home delivery service or go to the nearest retailer to get required product in a short period. On the other hand, marketing channel also enables the manufacturers in accordance with customer demand to produce and meet customers' demands with the minimized logistics cost. While design marketing channel, there are two aspects needed to be considered [53]:

- Service in meet customer demands
- Drivers in meeting customer demands

In the Service aspect, companies need to pay attention to the following points to improve the customer satisfaction.

- Response time
- Product variety
- Product availability
- Customer experience
- Time to market
- Order visibility
- Returnability

Response time refers to the total time between a customer places an order and the manufacturer receives it. Product variety is how much types of goods the marketing channel can offer to customers. Product availability is the possibility that there are products in stock when a client places an order. Customer experience refers to the comfort level that client places, receives, and cancels orders. It also includes the factors that affect the customers' feeling during the procurement process. Time to market refers to the time it cost before a new product comes to the market. Order visibility relates to the difficulty of a customer tracking the order after it is placed. Returnability is the degree of difficulty that a customer can return a defective or unsatisfied product to the seller. It is noteworthy that there are no companies in the market can perform all these factors at the highest level. For wise manufacturers, there should be a trade-off according to them among all the factors customer segment model instead of pursuit to be perfect in all aspects.

On the other aspect, the drivers in meeting customer needs are also essential to marketing channel design process. Since the main problems in small and medium-sized manufacturers are that the company scale is small and resources are limited, the aim of modifying the drivers of performance is to balance the responsiveness and the efficiency. There are four typical kinds of drivers:

- Inventory
- Facilities
- Transportation
- Information

Inventory refers to the products in stock, it is the result of the mismatch between supply and demand. Companies can determine the amount of inventory according to the forecast of future customer need.

For small and medium-sized manufacturers, inventory is a crucial method to increase the ability to accept orders. By stock a certain amount of products in the distribution centers or retailer warehouses, manufacturers can make the product available to satisfy the increasing customer demands. In this way, manufacturers can accept more orders from customers and earn more profit. Inventory can also reduce the cost by utilizing economies of scale during the distribution process. High inventory level will increase the responsiveness and lower the transportation cost. However, the stock holding cost will increase, so the emphasis of making inventory strategies for marketing channel is to find the best balance point of responsiveness and stock holding cost.

In marketing channel design process, facilities refer to the location that the product is stocked. The number and location of facilities will influence both the responsiveness and efficient of marketing channel. By increasing the number and decentralize the facilities, manufacturers can make their product closer to the customers and achieve higher responsiveness and lower transportation cost. but the facility and inventory cost will be increased. Vice versa, centralized facilities will reduce the facility and inventory cost, but at the price of higher transportation cost and lower responsiveness.

Transportation refers to the movement of the goods between different links of the marketing channel. During the marketing channel design process, manufacturers need to determine the combination of transportation modes, transportation paths, the number and location of intermediate consolidation points. Same with the other aspects, small and medium-sized manufacturers need to pursuit the balance of responsiveness and efficient, fast transportation can increase the responsiveness and lower the inventory cost, while also raising the transportation cost.

Information related to the collection and analysis process of the data along whole marketing channel, it consists the facility information, inventory information, transportation information, cost information, price information and customer information. As the most important driver, information impact other drivers directly. By using high efficient information collection and analysis system, manufacturers can share information with all links along the marketing channel to reduce inventory cost, transportation cost and facility cost, the responsiveness can also be increased at the same time.

Generally, according to the number of intermediaries between the final customer and the manufacturer, there are two main kinds of marketing channel structure: direct channel and indirect channel, and each primary type can be divided into several sub-categories. Marketing channel helps manufacturers receives the information (orders) from the customers directly or indirectly, and then deliver the Value (products) to the customers. It can be considered as the physical performance of the value delivery model.

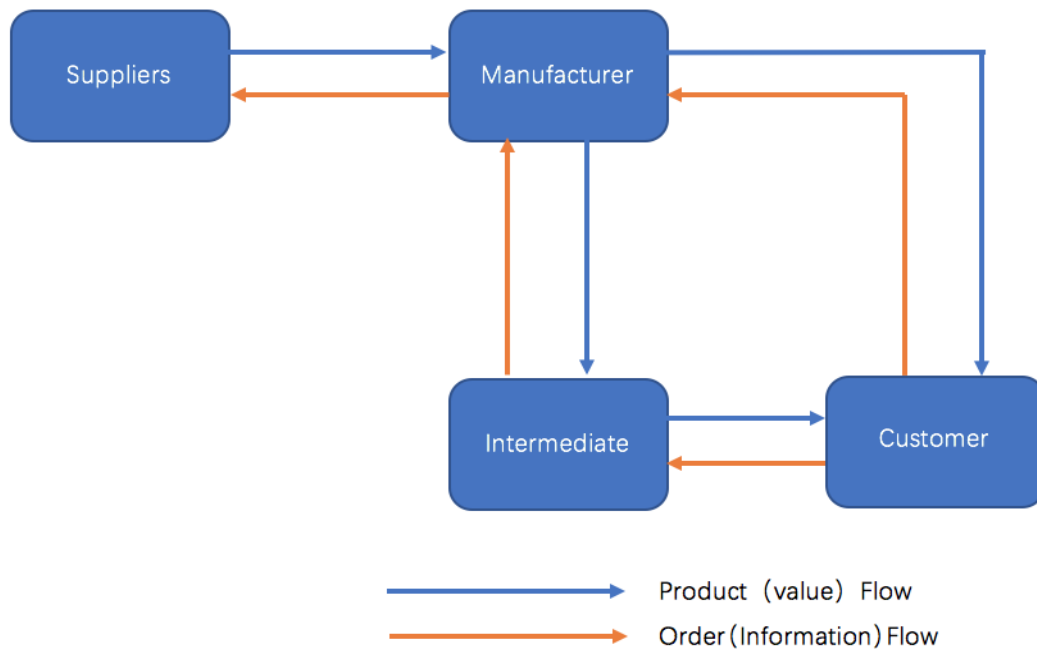


Figure 30 General Structure of Marketing Channel

Direct channel

The direct channel also called zero-level channel, producers sell the product to final customers directly, and save the intermediate links. There are two kinds of typical direct marketing channels, open physical retail stores and direct online selling. Open physical retail stores can help manufacturers to achieve high responsiveness, transportation cost, and provide high product availability to customers. But for small and medium-sized manufacturers, open up several physical stores may not be a wise decision. Small and medium-sized manufacturers' capital are always limited, as most of the fund is allocated to material procurement and manufacturing process, the rest money is not enough to pay for the cost of setting up too many physical stores. Someone suggest that manufacturers can follow American or Chinese manufacturers' examples to open up several big retail stores in regional center cities to reduce the cost. But as a sparsely populated country, Norway especially in the north area, the distribution of cities and towns is decentralized. That results in a situation that few retail stores in regional center cities can not satisfy the demands of customers. On the other hand, the store rental fees, sore maintenance cost, and other necessary expense increase the total facility cost of marketing channel and further aggravates the problem of funds insufficient. Besides, as the customer demand is fluctuating, to maintain high responsiveness, manufacturers need to keep the inventory at a high level at the retail store, so the inventory cost is automatically high. The population distribution is shown in Table 1 to Table 3.

Table 1 Urban settlements with 10 000 inhabitants or more. Population and area (1)

URBAN SETTLEMENTS	POPULATION (2016)	AREA(KM2)
OSLO	975 744	265.7
BERGEN	252 772	86.5
STAVANGER/SANDNES	213 313	73.6
STAVANGER	.	.
SANDNES	.	.
TRONDHEIM	177 617	57.5
DRAMMEN	115 137	51.0
FREDRIKSTAD/SARPSBORG	109 907	58.2
FREDRIKSTAD	.	.
SARPSBORG	.	.
PORSGRUNN/SKIEN	92 001	52.7
PORSGRUNN	.	.
SKIEN	.	.
KRISTIANSAND	61 037	25.0
ÅLESUND	51 474	27.4
LANGEVÅG	.	.
ÅLESUND	.	.
SPJELKAVIK	.	.
TØNSBERG	51 061	26.4
MOSS	46 158	21.8
HAUGESUND	44 536	20.6
SANDEFJORD	43 222	23.9
ARENDAL	42 788	30.9

Table 2 Urban settlements with 10 000 inhabitants or more. Population and area (2)

URBAN SETTLEMENTS	POPULATION (2016)	AREA(KM2)
BODØ	40 209	14.0
TROMSØ	34 283	12.1
HAMAR	26 828	13.7
HALDEN	25 113	14.2
LARVIK	23 927	13.2
ASKØY	22 777	14.6
KONGSBERG	21 269	12.3
MOLDE	20 892	9.1
HARSTAD	20 793	11.2
HORTEN	20 301	8.6
LILLEHAMMER	20 016	11.0
GJØVIK	19 982	12.6
SKI	18 960	9.4
MO I RANA	18 555	11.9
KRISTIANSUND	18 355	8.2
JESSHEIM	17 221	7.0
KORSVIK	17 203	7.4
TROMSDALEN	16 483	5.2
HØNEFOSS	15 438	9.0
ELVERUM	14 794	10.8
ALTA	14 737	9.1
NARVIK	14 279	6.8
ASKIM	14 137	7.3

Table 3 Urban settlements with 10 000 inhabitants or more. Population and area (3)

URBAN SETTLEMENTS	POPULATION (2016)	AREA(KM2)
LEIRVIK	14 085	9.7
DRØBAK	13 431	6.1
OSØYRO	13 282	8.7
VENNESLA	12 816	7.3
RÅHOLT	12 682	8.2
NESODDTANGEN	12 599	6.2
GRIMSTAD	12 522	9.4
STEINKJER	12 466	7.8
ARNA	12 208	6.1
KONGSVINGER	11 972	7.9
STJØRDALSHALSEN	11 934	6.4
BRYNE	11 832	5.2
EGERSUND	11 477	6.3
LOMMEDALEN	11 383	3.9
KOPERVIK	11 335	7.3
ÅLGÅRD/FIGGJO	11 231	4.9
KNARREVIK/STRAUME	10 818	6.8
MANDAL	10 790	6.3
FØRDE	10 255	5.5

Compared with open physical retail stores, direct online selling is a low-cost choice with several advantages. First, the online transaction is much convenient for both manufacturers and customers. Compare with the traditional way. Direct online sale has no geographical restriction, customers from all over the world can contact the manufacturers directly. That results in the substantial growth of customer base. Second, online sale can help manufacturers to improve the profit. Since the cost of running websites is much less than open up a physical retail store, manufacturers can have a much larger profit

margin. They can allocate more funds on improving customer shopping experience such as provide a faster and more efficient goods delivery system or lower the price to attract more customers. With the improvement of customer satisfaction, the sales will be promoted. On the other hand, as the website gives the customer from all over the world a 24/7, 365 days' access to purchase the goods, the business is expanded, and the sale will be raised. Besides, with the popularity of the computer and the development of the Internet, the convenient and secure online shopping is more welcomed by customers, the transaction process can be substantially simplified, and manufacturers can receive feedback on the product and service from customers instantly.

However, online selling also has disadvantages, compared with traditional selling, manufacturers who choose online sale needs to set up and coordinate between multiple new departments such as technical service division, logistics center, communication department and external banks. It will lead to the increase of total cost, and if there are any imperfect operations during cross-departmental communication, the running of the company will be impacted. Further, as online selling increases the risk of purchase and needs longer time to satisfy customers' need, delivery delay, goods damage and other undesirable effect caused by accidental factor will do harm to customer satisfaction and brand image. [54] Manufacturers who decided to utilize online selling also has some aspects to consider about. First, to obtain high responsiveness, manufacturers should set up distribution centers, the location and number of distribution center need to be decided after taking the balance of responsiveness and cost into account. Besides, manufacturers also need to decide whether to create product delivery department to provide product delivery service or outsourcing it to the third-party delivery companies. Outsourcing will decrease the delivery cost dramatically, but the responsiveness would be adversely affected.

Without the impact of intermediaries, manufacturers can respond to the change of clients' demand timely, then modify the production schedule and supply plan. Besides, manufacturers can also make different marketing strategic decisions based on the fluctuating market environment. However, the direct channel also has defects. As direct channel requires manufacturers open physical retail stores or deliver product to the final customer directly, the operating cost and selling risk will be significantly increased.

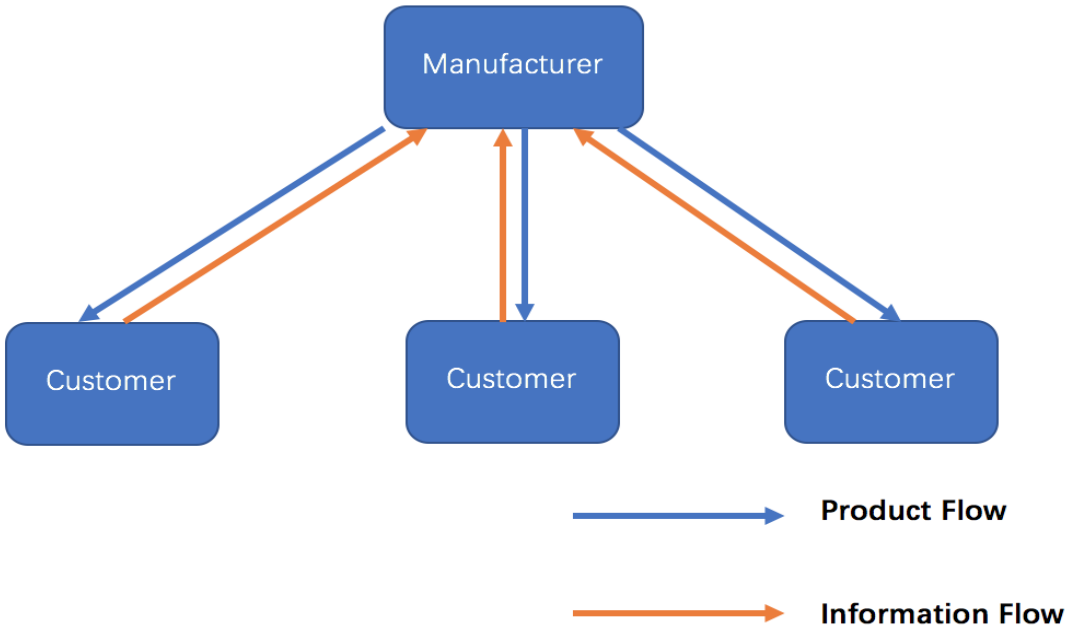


Figure 31 Structure of Direct Marketing Channel

Indirect channel

Indirect channel refers to the marketing channel that use intermediate links to connect manufacturers and final customers. With the intermediaries intervene, manufacturers can expand their market share and decrease the operating risk. According to how customer obtains the goods and where the products are stored, indirect marketing channel can be subdivided into several categories. As small and medium-sized manufacturers in Northern Norway have themselves characteristic, such as limited financial resource and sparsely customer base distribution, most of the commonly used marketing channel strategies are not suitable. Here just list some applicable distribution methods as follow.

The first one is retailer storage with customer pickup. Third party retailers store the product in their stores, customers procure the product in the physical retail stores. Manufacturers only need to play the role of supplier and make the product plan according to the order from the retailers without considering about the facilities cost. As most of the inventory was transferred from the manufacturer to the retailers, the inventory cost of manufacturers can be magnificently reduced, and by utilize order & shipment consolidation, transportation cost will decrease dramatically too. Besides, since the customer procures product in the physical store directly, for manufacturers, the information cost is minimal. On performance aspect, because of the storage is at local retail stores, high responsiveness, high returnability, and high product availability can be achieved. However, the retailer storage with customer pickup channel also has drawbacks. Due to the limitations, the product variety in physical retail stores is poor, and because of the distances involves, new product always needs a long time before it accesses to the market.

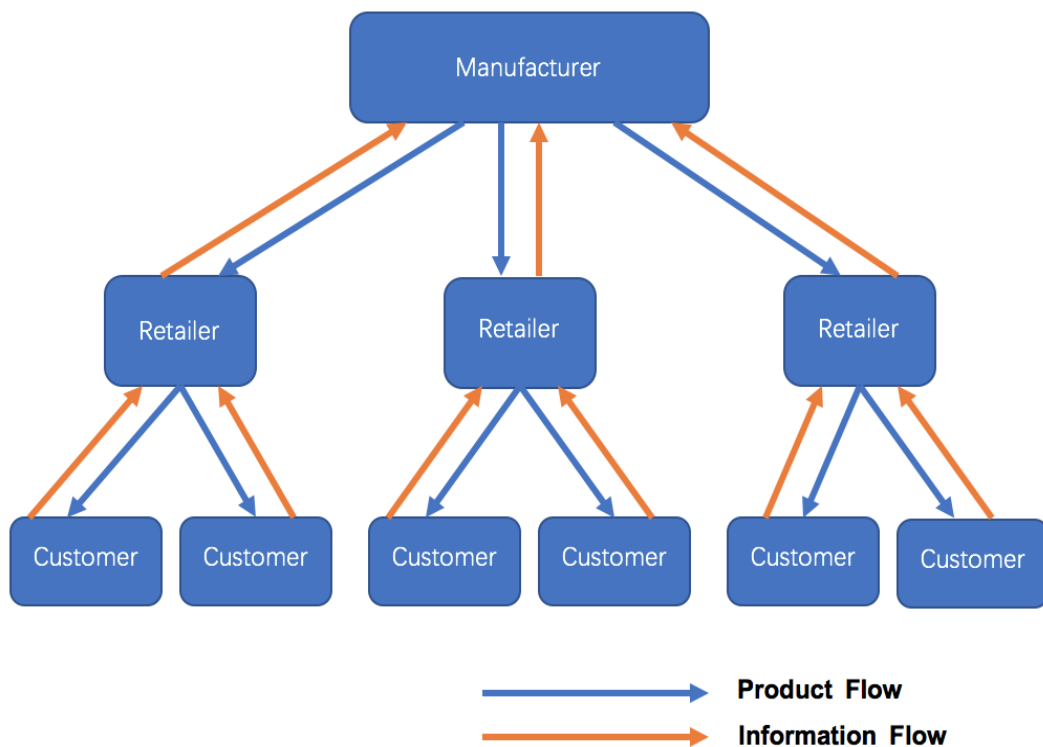


Figure 32 Structure of Retailer Storage with Customer Pickup

The second one is manufacturer storage with direct shipping. Customers place an order through the retailer's website, and the product is delivered from the manufacturers to the customer directly. By cooperate with retailers, manufacturers can utilize a more mature and popular online platform to advertising their product instead of building their website, which helps manufacturers to obtain a larger potential customer base. By using manufacturer storage with direct shipping strategy, manufacturers can provide a high product variety and product availability. Without the space limitation, the customers can view and select almost all kinds of products on the retailer's website, but that will also cause the competition with the rival products. Further, direct shipping enables the manufacturers to put their new product to the market as soon as possible. And as the aggregation at manufacturers, customers can obtain high product availability. On the other hand, this kind of marketing channel strategy also has a lot of limits and defects. Since the inventory is at the manufacturers, the inventory cost will be very high. Besides, because of the distance and the impact of intermediate links, the response time is always long, to remedy this drawback, manufacturers need to choose fast and expensive transport method or build up several distribution centers to achieve high responsiveness, which results in the substantial increase in transportation cost. The last problem is the distance increase the difficulty of returnability, and to obtain a better order visibility, manufacturers need to invest much money in enhancing the information transformation network among the customers, retailers, and manufacturers.

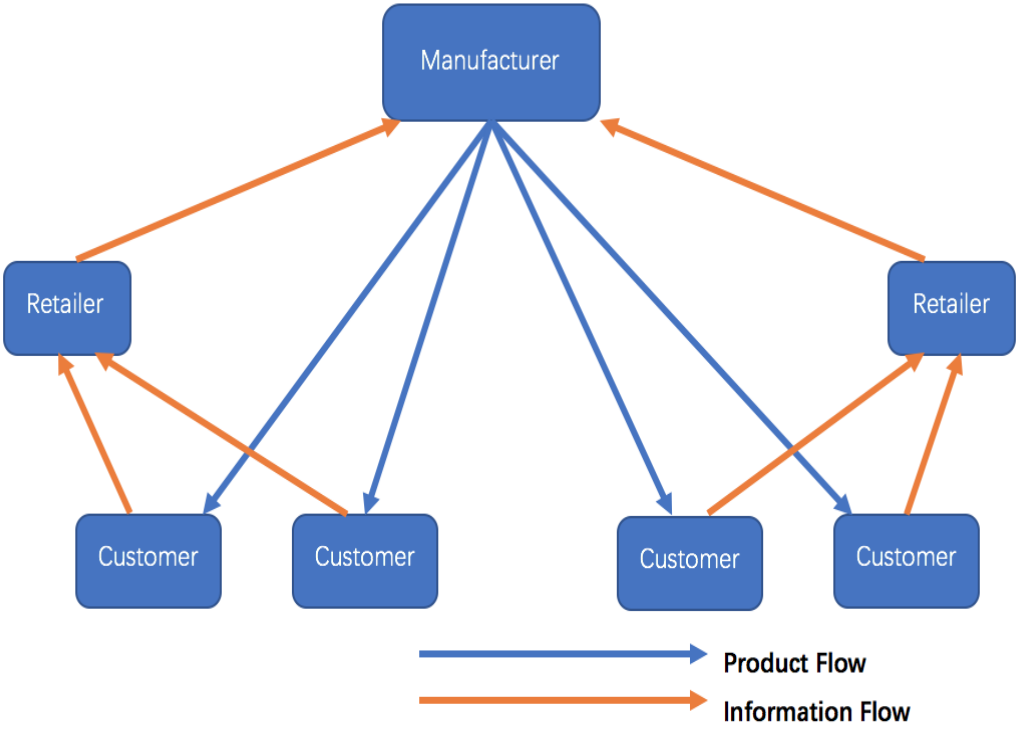


Figure 33 Structure of Manufacturer Storage with direct shipping

Another marketing channel strategy is manufacturers or distributor storage with customer pickup. It can be considered as a combination and modified version of the previous marketing channel strategies mentioned before. This strategy suggests that manufacturers cooperate with intermediate distributors to storage the inventory. In this way, the inventory cost and facility cost can be magnificently reduced. At Meanwhile, since compared with the manufacturers, the intermediate distributors are much closer to the local customers, by storage product at distributors' warehouse, the lead time can be shortened significantly. Same with the previous marketing strategy, customer place order through third party

retailer's' website and can have a high product variety, but in this method, customers need to pick up the product at nearby pickup sites settled by manufacturers. For small and medium-sized manufacturers, building up exclusive pickup sites for their product is unwise and uneconomic, to further reducing the facility cost, manufacturers can cooperate with some local supermarket, gas station or other local stores to share pickup sites with other companies. By add goods returning management function to the pickup sites, great returnability can also be achieved easily. Besides, as the transportation of goods from distributor warehouse to pickup sites is operated by the distributor and can have an aggregation, manufacturers further lowering the logistics cost. However, in order to provide high order visibility to the customer, this marketing channel strategy require manufacturers to provide an efficient information infrastructure to ensure the real-time and accurate information transfer among the manufacturers, online retailers, distributors, pickup sites and customers. Also, since the customers need to pick up the goods at the pickup sites by themselves, compare with home delivery service, the customer experience, and product availability will be affected.

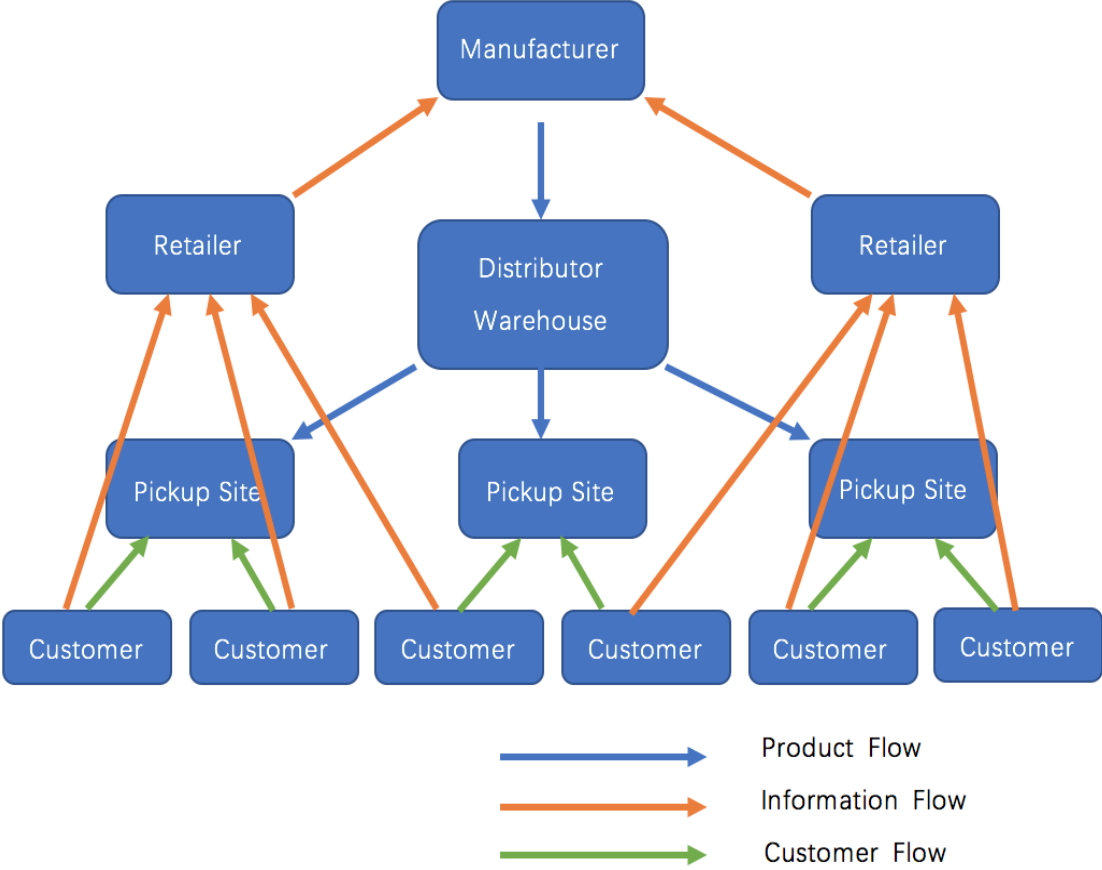


Figure 34 Structure of Distributor storage with customer pickup

Marketing channel is essential to value delivery model of a company. The performance characteristic of different marketing channel strategies is shown in Table 1. Small and medium-sized manufacturers in sparsely populated areas in Northern Norway should choose one or several marketing channels according to their situation, customer segments, and the local market environment.

Table 4 Performance of Different Marketing Channels

FACTOR / PERFORMANCE	OPEN PHYSICAL RETAILER	DIRECT ONLINE SELLING	RETAILER STORAGE WITH CUSTOMER PICKUP	MANUFACTURER STORAGE WITH DIRECT SHIPPING	DISTRIBUTOR STORAGE WITH CUSTOMER PICKUP
Cost factor					
Inventory	High	Low	Low	High	Low
Transportation	Low	High	Low	High	Low
Facility	High	Low	Low	Low	Low
Information	Low	High	Low	High	High
Service factor					
Response time	Fast	Slow	Fast	Slow	High
Product variety	Low	High	Low	High	High
Product availability	High	Low	High	Low	Low
Experience	High	Low	High	Low	Low
Time to market	Slow	Fast	Slow	Slow	Slow
Order visibility	—	High	—	Low	Low
Returnability	Easy	Hard	Easy	Hard	Easy

3.2.4.3 Revenue Model

The measurement standard of a successful business model is if it has the capacity to help firms generate high profit. For companies, high profit does not only mean perfect income statements, it also contributes to establishing economic advantages. High profit is also essential to companies' future development. When the capital is plentiful, firms can employ the brightest people to ensure the smooth operation of each component of the business model. High profit also enables businesses to expand customer service to grow the client base. Besides, high profit also gives the companies an opportunity to inject money into product research and development. All in all, a profitable revenue model will help business organizations creating a virtuous cycle and keep competitive in the market for an extended period.

According to the study in literature review section, although there are many different types of revenue models for companies in different industries, but for manufacturers, the ways to generate profit is single and simple. Manufacturers produce the product and then generate revenue by selling the goods to customers or downstream companies. For small and medium-sized manufacturers in sparsely populated

areas in northern Norway, since most of their products are low-value and consumption goods, the profit channel is more undiversified, and the single industrial structure aggravated this problem. Thus, as for small and medium-sized manufacturers, the space of existing revenue model improvement is tiny.

That does not mean manufacturers cannot innovate their revenue model. Manufacturers can improve the existing profit from the following aspects [55]:

- Close to resources
- Product innovation
- Price raising
- Build up powerful brand
- Moving up in the value chain

The first one is close to the resources. Manufacturers should set up their factories close to the resources. It can be labor resource, raw materials or energy resource. It depends on which one is the most essential to manufacturer's production. A greater distance means higher transportation cost and more uncertainty. Shorten the distance between the manufacturers and resources can help companies ensure the normal operation of production. Close to resources also enable the manufacturers to have more choices and gain a competitive position while selecting the suppliers, and it can effectively help reduce the cost. Further, after the business grows to a point, close to resources can help the company monopolize the local resources and erect barriers to prevent competitors from entering the market.

The second one is product innovation. By providing a whole new product or creating an entirely new category, manufacturers can open new markets and avoid fierce competition. While dominating the new market, manufacturers can sell their product at a high profit until the competitors appear.

Third, price rising. It is considered as the most efficient and direct way to improve the profit, but because of afraid of customer defection, most of SMEs afraid to raising the price. That is true, some customers that only pay attention to price will leave when price raising, but generally it is a minority. Raising price can help small and medium-sized manufacturers get rid of the customer who just expects lower price and focus more on the high-value customers.

The next one is build up a powerful brand. For part of the customers, the powerful brand is a statement of high quality, and they are willing to pay more money in exchange for this kind of feeling.

Moving up in the value chain is another way to improve the profit. In the most market, for manufacturers, the closer to the customer, the more profit it can earn. Play the role of the retailer is a good way to close to the client, but it will result in the increase of costs.

Besides improve existing profit, utilizing the circular economy method to expand income channels is a possible route to increase the revenue. Theory of circular economy is first put forward by Kenneth E. Boulding in the nineteen-sixties. Boulding describes the development of the global economy as an isolated system that relies on consuming its own resources and will crumble because of resource exhaustion. The only method to extend the lifespan of the system is to decrease the amount of waste discharge as much as possible and find an efficient way for resources reusing and recycling. [56]

In the production process, it inevitably produces manufacturing wastes, and with the development of economic, the amount of waste increased during the same years. In Norway, from 1955 to 2014, the

amount of waste increased by sixty percent, even greater than the fifty percent growth of GDP, and with 2.6 million tons, manufacturing waste contribute about twenty-two percent of the total. [57]

Manufacturing waste, or in a more accurate way, manufacturing residuals, needed to be disposal in various treatment, and if the treatment is not suitable, it will lead to a sharply rise of cost and subsequent pollution. In the revenue model section, the focus is how small and medium-sized manufacturers sell the manufacturing residual to downstream firms to generate revenue instead of consuming money to disposal the waste.

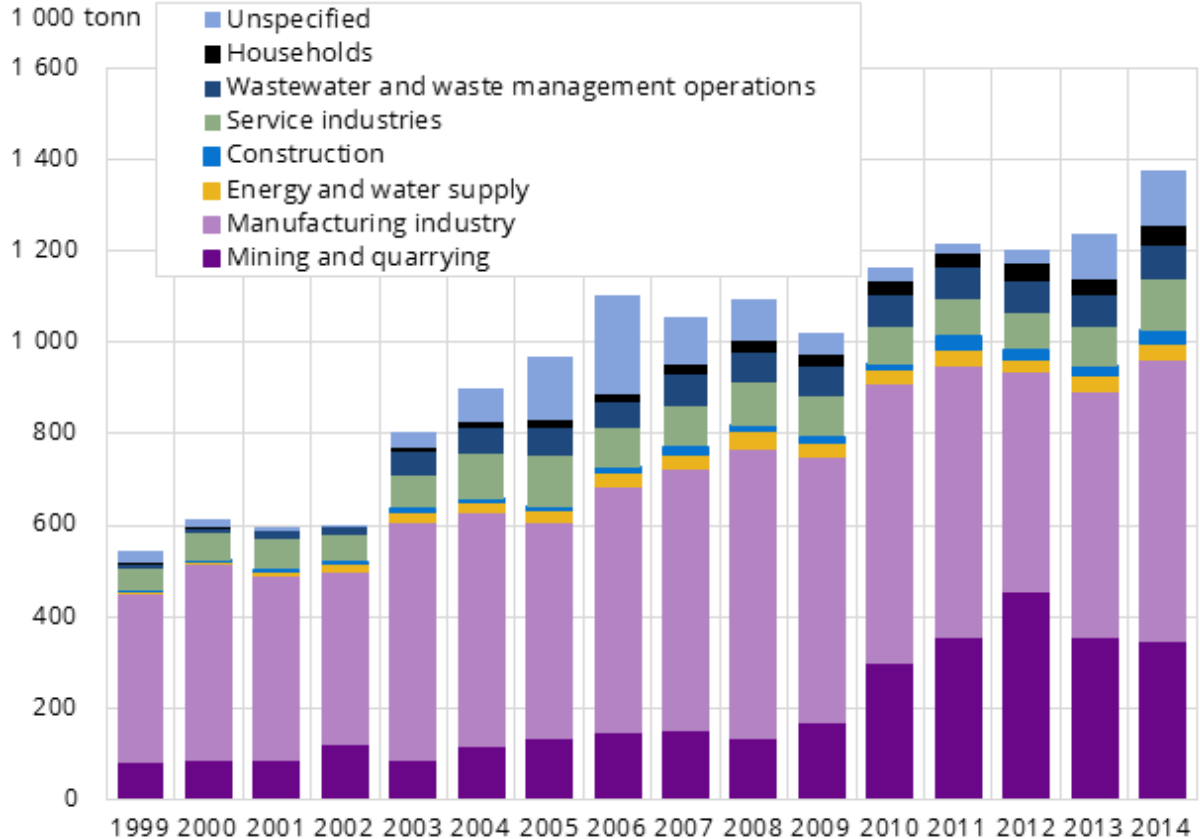


Figure 35 Hazardous waste sent to approved treatment 1999-2014

In circular economy philosophy, the by-product and the scrap is a kind of wrong positioned resource, for one company it may be a burden and increase the total cost, but for another, it can be critical production resources. For small and medium-sized manufacturers in northern Norway, the aim of the circular economy is to build up a connection between different manufacturers to help polluters reduce the waste disposal cost, even earn the profit by selling the manufacturing residuals to downstream firms. For instance, the wood chips can be regarded as a kind of waste during furniture production process. For furniture manufacturers, instead of spend time, energy, and money to bury or incinerate the chips, package them to sell to the thermal insulation material factories is a far wiser choice. Everyone benefits during the selling process, furniture manufacturers maximize the residual value of the wood while saving the waste disposal cost, thermal insulation material factory saves money, and avoids contamination problems caused by wood chip incineration.

For manufacturers, to establish the waste recycling system, there are several factors should be noted. First, manufacturers need to find suitable clients for the manufacturing residuals. It is somewhat like finding appropriate customers for the product. Manufacturers need to consider about various cost caused

by the manufacturing residuals trade, such as packaging and transportation cost, if the total manufacturing trade cost is higher than waste disposal cost, the waste recycling system would be meaningless. Manufacturers also need to set up waste management department to monitoring and tracking the waste generation during the manufacturing process, by analyzing the data, manufacturers can improve the manufacturing technique and find a more valuable use of the residues. Besides, manufacturers need to take the legal, policies factors into account, the trade of hazardous waste should be supervised by the government or environmental monitoring organizations to avoid any unnecessary troubles.

3.2.4.4 Connection of Components

Different modules in the new business model interact each other. In the value proposition model, the UVP module and the USP module in the value proposition model affect the customer classification module and the customer value evaluation module respectively. And the whole value proposition model, the customer segment module, and the competitor module in the partner network model jointly decide the markup module in the pricing model.

In the value capture model, the entire resource model module determines the cost structure breakdown module in the cost model module, and also affect the existing revenue innovation module in the revenue model, besides, one of its sub-modules, the tangible module is impacted by the sourcing channel module in the distribution channel model. For cost model aspect, the sub-modules interact each other, the cost structure breakdown module and recycling economy model determine the cost reduction module together, and the recycling economy module affects the expand revenue channel module in the revenue model module. Also, the entirety of the cost model is affected by the distribution model, and the cost model module itself affects the cost element in the pricing model.

In the value delivery model, the buyer-supplier module in the partner network model affects the sourcing channel module in the distribution channel model, while the cooperation partners module and the manufacturer-retailer module determine the marketing channel module jointly. In the revenue model module, the two sub-module are influenced by the other modules in the business model. The existing revenue module is affected by the resource model, the pricing model, the partner network model, the value proposition model, the distribution model, the cost model, and the customer segment module jointly, and the expand revenue channel module is determined by the recycling economy module in the cost model.

There is a subtle relationship among the modules of the new business model, changes in one module will cause chain reactions that can eventually influence all the other modules. The business model structure and the relationship among the business model modules are shown in figure 59.

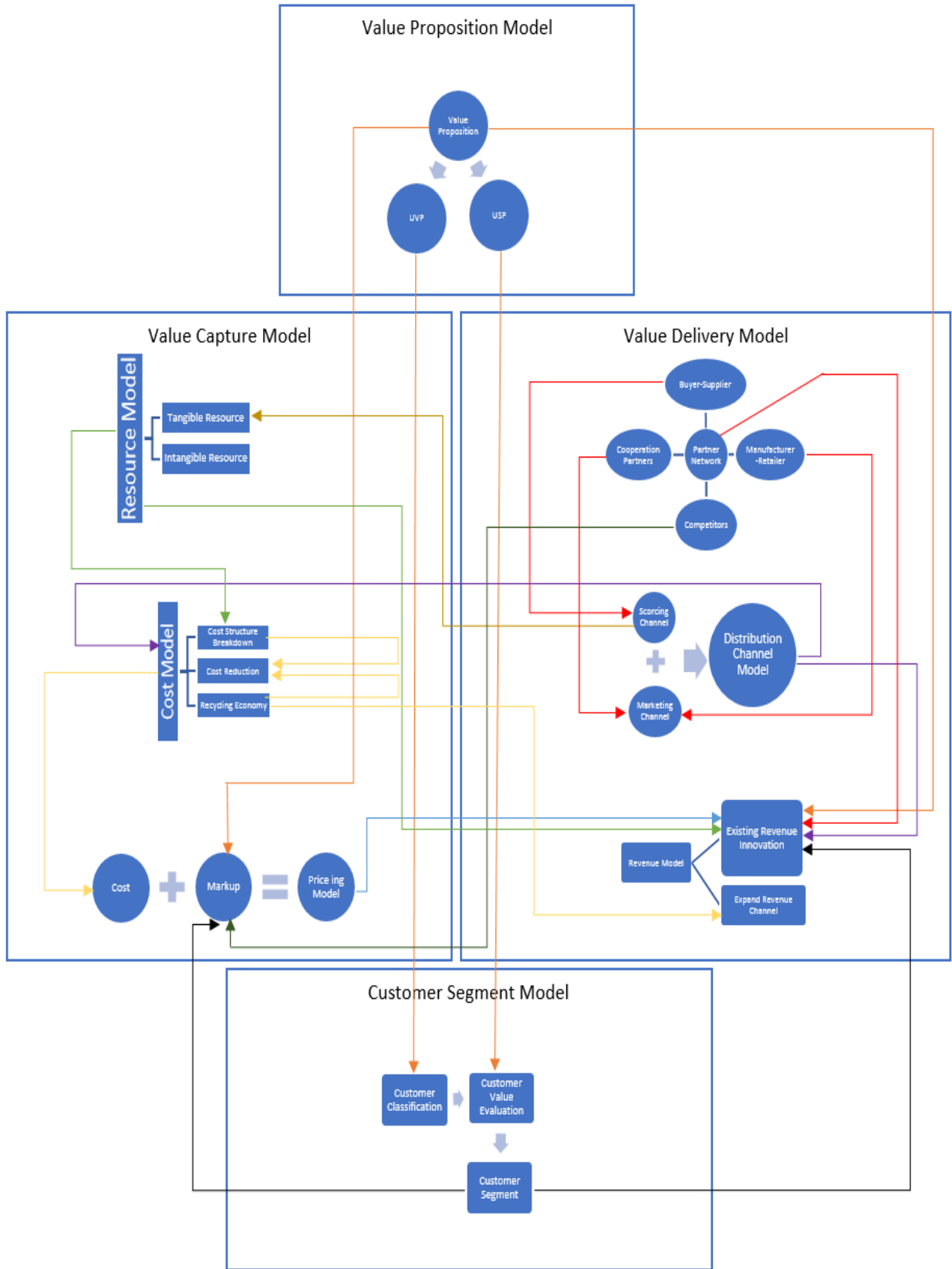


Figure 36 New Business Model Structure and the Connection between Components

4 A Case Study of Stella Polaris

Stella Polaris is one of the world-leading arctic shrimp supplier and an accepted star SME in Norway. In 1968, Stella Polaris founded its first traditional fish market dock in K arvikhamn, a small village in Troms. By the mid-Eighties, they started began producing arctic shrimps. As one of the world’s leading coldwater shrimp producer, Stella Polaris export their peeled, cooked, and frozen arctic shrimps to Europe, North America, Asia, and favored by customer all over the world. The annual profit of Stella Polaris amount to hundreds of millions of NOK, although it is a small-sized shrimp manufacturer consists of less than fifty full-time employees. The business success of Stella Polaris benefits from the utilizing of the successful business model and suitable business strategies. This section aims to analyze Stella Polaris business strategies from the business model aspect, and apply the business model put forward before to give some improvement suggestions.

Customer Segment

Stella Polaris have a clear understanding of the customers and the market. In geographic characteristic and purchase history aspect, after investigation and research fifteen years ago, they find it is difficult for them to grab market share and capture profit by focusing on the market in Norway. Since the abundant fishery resource and unique culture lifestyle in Norway led to a result that compares with cooked, peeled and frozen prawns, Norwegians prefer fresh shrimps with the shell. In this specific market environment, Stella Polaris made a wise switch in customer segmentation, and the management team decided to mostly abandon the domestic and turn to focus on the market in England, Italy and other countries in Scandinavia. The fact proved this decision is profitable and far-sighted, by cooperating with big retailers in these countries, Stella Polaris has successfully entered the market and increased their market share and customer base in just a few years. In the demographic aspect, Stella Polaris draw lessons from the experience of other companies in their market and find that people over forty years old consist the largest customer group. That is because of their diet, daily schedule, and lifestyle. After understanding this situation and analysis the target customers’ purchase history, Stella Polaris made series production and sale plans to help grab the market share and earn more profit.

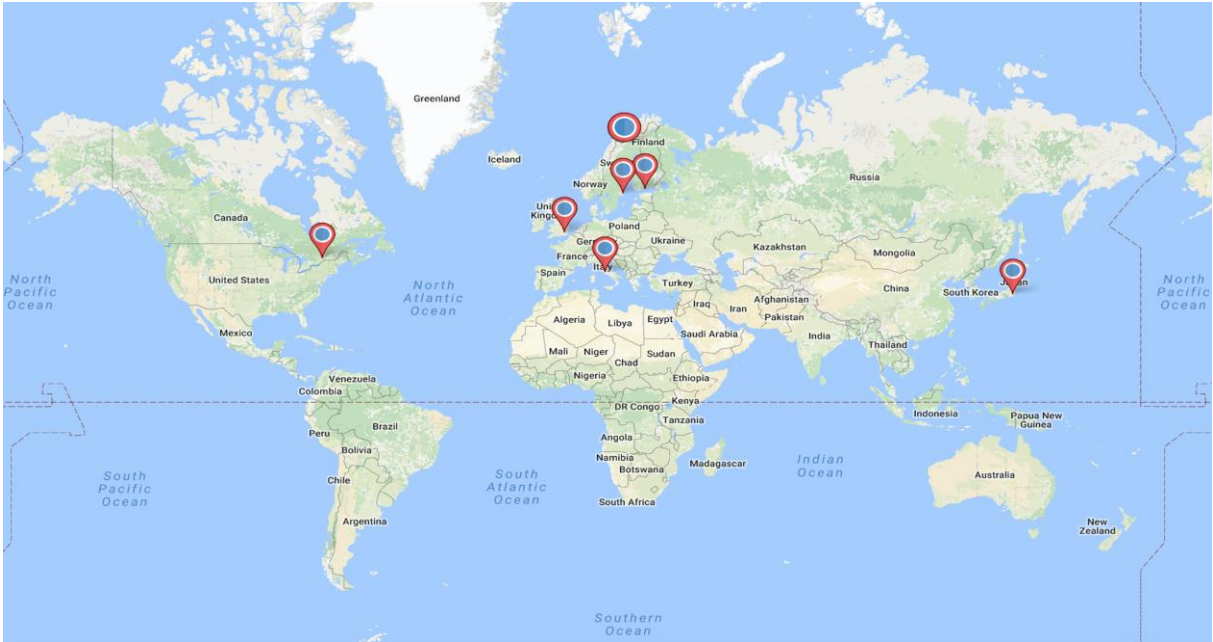


Figure 37 Business Distribution Map of Stella Polaris

Value Proposition

With profound advantages regarding natural ocean resources and geography, the arctic shrimp which native to Northern Norway has an inherent advantage in quality and safety. Stella Polaris takes full use of this pros and manifests it by utilizing different kinds of propaganda. To keep the high quality in the production process, Stella Polaris ask their suppliers to freeze the shrimp as soon as it been caught from the Arctic Ocean, and then transport to their production factory directly. The prawns will be cooked, peeled, and removed heads in the production factory, and then frozen with a protective layer of cold water to combat the reduction in quality and appearance. For years, Stella Polaris marketing department aims to highlight the product features and has already built up a good reputation in their customer base by laying emphasis on conveying their brand concept to the clients. Customers can see the words like “high quality,” “premium,” “Arctic” everywhere on the package and their website. By attaching labels on the external packing, Stella Polaris also enable their customer to track each pack of shrimps. When the customers scan the barcode on the label, they can find the information about the date of production at the production plant, and even the fishing vessel that caught the shrimps. By enhancing the USP of “high quality,” and “safety,” Stella Polaris has attracted a large number of customers and has a strong share of the cooked and peeled shrimp market.



Figure 38 Various Packages of Stella Polaris Product

Another unique selling proposition of Stella Polaris is fast delivery. Stella Polaris cooperate with big retailers in many countries and play a role of supplier, by setting up docks to hold inventory and utilizing an efficient logistic system, short lead time can be realized. Under normal circumstances, the product can be sent to the customer four or five days after they place the order, much shorter than their competitors. Although Stella Polaris paid a high price for it and the logistic cost is much higher than most of other companies in this industry, short lead time also gives Stella Polaris a huge advantage in the market competition. Besides, do not as its competitors did before, Stella Polaris chose to give up attracting customers by providing different flavors, and turn to provide product in various packaging sizes, from 150 grams to 2.5 Kg. This customized service strategy enables it to provide a high flexibility of packaging size under their own brand or customers’ brand and makes it welcomed ad highly appraised by the clients who have different needs

Resource Model

In the tangible resources aspect, Stella Polaris lays stress on improving the utilization of material by utilizing advanced technologies and facilities. Since 2010, by purchasing and using high-precision automatic peeling, cooking, and packing machines from suppliers in Germany and Japan, the product process is integrated, convenient and efficient. Stella Polaris has advanced crafts, adopts the advanced

equipment to ensure product quality and obtain a high resource utilization. The automatic product line also decreases the raw material consumption. Before the packaging process, the automatic production machines will pick and weigh the shrimps repeatedly to ensure the quality and weight of the individual pack and avoid exorbitant defective rate. Advanced manufacturing system also speeds up the production. Because of the particularity of seafood, the whole production process, from fishing to packaging, should be done in a short time, by utilizing efficiency logistics and manufacturing system, Stella Polaris significantly reduces the raw material waste rate. Stella Polaris also attach much importance to their raw material resources purchase. The long-term cooperation with the suppliers in Norway, Iceland, Russia, and Canada ensure the steady supply of raw material. Besides Stella Polaris also set up a raw material stock management system to cater for changes in customer demand and resources market change, adequate raw material inventory ensures the in-time delivery and avoids the raw material shortage caused by the reduction of shrimp catches in winter. The packaging material is another kind vital material to Stella Polaris, they set up two separated warehouses to stock the packaging materials to ensure it is available at all times. In addition, the land resource is essential to Stella Polaris, the excellent geographical location and port condition of the production plant in Kårvikhamn allow Stella Polaris to input material and output product conveniently.

In intangible resources aspect, thinking much of human resources development is one of the key factors of Stella Polaris success. In production, logistics, and sales department, Stella Polaris aims to create a clear division of responsibility and enhance the information sharing between departments within the company to improve the agility in the business process. When the sales department in Tromsø receives the orders from the customer, the information will be transferred to the production plant in Kårvikhamn, and the production department will react immediately according to the order requirement and the inventory situation, then the logistics department will deliver the product to the customer within the stipulated time. Benefit from the optimal use of experienced and professional workforce team, Stella Polaris realizes a fast order processing system and the guarantee of the high product quality.

Cost Model

The financial department of Stella Polaris has a clear cost breakdown structure and reviews their cost condition periodically. To improve the net revenue, the management team use different method and strategies to control and reduce different kinds of costs. For small and medium-sized manufacturers like Stella Polaris, material cost accounts for the vast majority of their total cost. To reduce the raw material and packaging material cost, Stella Polaris develop long-term cooperation relationship with their main suppliers and use bulk purchase strategy to get a discount from them. Since the fishery production of Arctic pawns has a decrease during the recent decade, and the increasingly strict fishery catch limits, the raw material price of arctic shrimp is getting higher and higher. To further lower the raw material purchasing cost, Stella Polaris is planning build up their own fishing fleet. This strategy will alleviate the shortage of raw material and help Stella Polaris reducing their reliance on the raw material suppliers to lower the raw material cost. But the management team also understand that it would be difficult to implement the fishing fleet plan. First, the purchase and maintenance fee of fishing vessels, and the salaries of sailors and fishers will increase the facilities & labor cost. Besides, as the fishing in the Arctic area is strictly regulated, the application procedure for the fishing authorization is complicated, it will take a long period and requires large-scale investment. Stella Polaris need to analyze and measure the ROI (return on investment), and then decide whether to carry out this plan or not.

Another major cost of small and medium-sized manufacturers is labor cost, but Stella Polaris have basically solved this problem by utilizing advanced automatic production line. From 2003 to 2014, Stella Polaris updated their production line continuously. Until now, all the production operations mechanization and automation, from the frozen material are sent into the freezer until the peeled and cooked shrimp are packaged. Compare with their competitors, the no manual operation production system help Stella Polaris reduces the high salary cost in Norway. As the same time, automatic production line also decreased the worker's operation difficulty and raised the working efficiency. For small and medium-sized manufacturers in Northern Norway, staff shortage is a severe problem. If some workers are sick or unable to work for some other reasons, the production process will be affected. By utilizing fully automatic production line, Stella Polaris has resolved this problem. As the operation difficulty was reduced, one worker can do multiple works, even if someone is absent, the production will not be affected. Besides, the automation, standardization, and informatization also ensure the consistency of the quality of their product and makes Stella Polaris one of the most automated shrimp producers in the world. In coming years, Stella Polaris plan to continue cutting down the labor cost by further utilizing fully automatic machines. In 2017, Stella Polaris plans to build several conveyors from the dock to the material warehouse to save the handling expense.



Figure 39 The Automatic Production line in Stella Polaris

In the recycling economy aspect, Stella Polaris has an innovation. They aim to create value by full use the whole pawn. For generations, shrimp producers only generated value by selling the shrimp meat and ignored the economic value of shrimp shell, although the meat only consists about forty percent of the total value of the shrimp (forty percent in shell and twenty percent disappear in the production process). From 2007, by cooperation with the fully owned subsidiary pharmaceutical company (Marealis AS), Stella Polaris almost realizes the reclamation of shrimp shell. By cooperate with internal and external scientific research tram, Stella Polaris found that the shell of Arctic pawns is effective at lowering the blood pressure and protecting the cardiovascular system. Stella Polaris decided to develop a kind of Arctic pawns shell capsule under Marealis AS's brand. After successful animal and human testing, this

new healthcare product will be available in the market within a few years. The reuse of production residuals not only help Stella Polaris saves the cost of waste disposal, but also open up a new revenue channel.

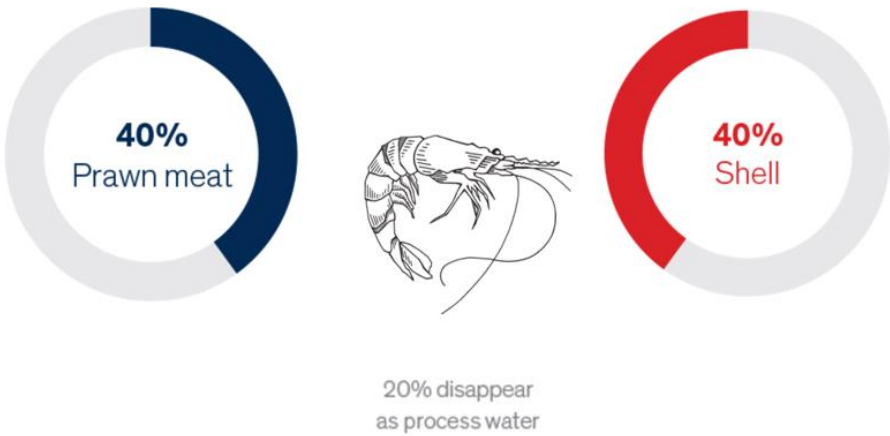


Figure 40 Fully Use of the Whole Shrimp

Pricing Model

The Marketing Department of Stella Polaris locates in Tromsø, the biggest city in the Arctic Circle. Compare with the production plant in Kårvikhamn. It is more convenient for Stella Polaris to monitor the market and enable the marketing team to react quickly to the change. The Marketing team of Stella Polaris has a sophisticated pricing system. Before their product first enters a new market, the marketing team will take a research of the local target customer segment, include the purchasing power of residents, wage level, purchase history, and the client's demand differences. They also take the prices of the similar product in the local market into account, then try to find the most appropriate price. For different markets, Stella Polaris makes different prices for their products, and these prices are all subject to the fluctuations of the local markets. The purpose of taking differential pricing is Stella Polaris has many overseas markets, the purchasing power of residents and customer demands is diverse from each other. Differential pricing method helps Stella Polaris quickly penetrating the local markets. It also enables Stella Polaris to attract and satisfy local customers, in the context of the net profit would not be affected.

Partner Network

Stella Polaris value the power of their partners and keep careful and prudent when choosing the material suppliers, the transport partners, and the retail partners. In raw material supplier aspect, to ensure the stable supply of Arctic cold water prawn, Stella Polaris sign contracts with multiple fishing companies. Before signing the contracts, Stella Polaris management team will take an investigation of different characteristics of the suppliers, and among all the characteristics, Stella Polaris traditionally concerned first and foremost with the stability. That is because for marine food manufacturers like Stella Polaris, to ensure the fresh and high quality of the product, the raw material cannot be stored for a long time after it was unfrozen. The stable supply system can help Stella Polaris guarantee stable quality high-yielding product all year round. Another characteristic Stella Polaris valued is the reliability, as the USP of Stella Polaris is the high quality of the product, they need to control the quality from the source of the raw material. In the contract, Stella Polaris asks their partner fishing companies to freeze the prawns as soon as they are caught to the deck of the fishing vessels, and transport it to the production plant in Kårvikhamn. The third characteristic is the price, Stella Polaris cooperate with multiple suppliers and use bulk-buying to obtain the discount and a favorable position in the price negotiation. Compare with

the three characteristics above, Stella Polaris does not attach much weight to the location of their raw material suppliers, as the shrimps are delivered from the fishing vessels to the manufacturing plant in Kårvikhamn directly, the site of the suppliers will not affect the production and the quality of the product.

In transport partner aspect, Stella Polaris most concerns about the safety and speed, because these two characteristics are essential to Stella Polaris to realize its fast delivery value proposition. When Stella Polaris is choosing its transport partners, they will take a risk assessment on different transportation companies and take their reputation in the market into account. Compare with low price, Stella Polaris pay more attention to the reliability, which makes Stella Polaris always cooperate with big and reputable transportation companies in different nations.

In retailer partner aspect, as Stella Polaris did not set up their own physical retailer shops, they focus on co-operating with big retailers in central cities in overseas markets. That is because customers in central cities have greater purchase power and more likely to accept their value proposition. Besides, big retailers are more reliable, and have larger and stable customer base, that help Stella Polaris grab larger market share and generate more profit with the cost is about the same. The management team of Stella Polaris also understand that in the negotiation with the retailers, the initiative is on the other side. So to attract retailers to put their product on their goods shelf, Stella Polaris enhances their value proposition by promise fast goods delivery. But in some situation, it is not enough. For example, in the North American market, as the competitors from Canada has geographic advantages, the value proposition of Stella Polaris has been weakened. Facing this unfavorable condition, Stella Polaris offers a lower price to attract the local retailers to place orders with them. Not like the design collaboration mentioned in the sourcing channel section above, Stella Polaris have a design collaboration with its partner retailers, they design the size package size according to the customers' needs and negotiate about the product should under Stella Polaris's brand or under their partner retailers'.

Distribution Channel

In sourcing channel aspect, since the strict fishing catch quota limit in the Arctic area, the supply of Arctic cold water prawn is always tight. The persistently high raw material price lead to a lower profit result in shrimp manufacturers raise prices to compensate. To mitigate this contradiction, Stella Polaris set up their portfolio contract system. Stella Polaris signed multiple kinds of contracts with about seventy suppliers from Norway, Russia, Canada, America, and Greenland. Among these suppliers, fifteen are big suppliers with large fishing fleets, Stella Polaris signed long-term supply contracts with them to keep the production running smoothly. On other hands, Stella Polaris also cooperate with small suppliers and seek for raw material in the spot market. That is because of the catch quota, and the situation that Stella Polaris must share the limited raw material resources with competitors, the material from the fifteen big suppliers is not enough to satisfy the production demand. The cooperation with small suppliers and raw material procurement from the spot market provide an effective mitigation and adaption to the scant supply of materials. By utilizing portfolio contract strategy, Stella Polaris can ensure an adequate supply of raw material, even in the freezing period in the winter. But as the raw material suppliers have the initiative, although Stella Polaris use bulk-purchase strategy to obtain discounts, the shrimp prices continue to soar, they still need to seeking for solutions to get out of the dilemma.

In marketing channel aspect, after considering and analyzing the current available resource, their existing economic capacity, local market situation, and the ratio of cost and return, Stella Polaris discover that under the existing condition, it is not feasible to open up their own retail stores. Besides,

consider the delivery cost and distance, Stella Polaris only play the role of suppliers to supply their product to the partner retailers, instead of selling the goods to the final customer. Their marketing strategy is similar to the Retailer Storage with Customer Pickup strategy, although it is primitive simple. However, it is the best possible choice and most suitable method for Stella Polaris right now. The management team of Stella Polaris also says that after their company grown bigger and when the market conditions permit, they may set up their own retail stores in central cities and extend their business to final customers, enable them to place orders and receive products from the retail stores and through the website.

Revenue Model

Until now, Stella Polaris only increase the existing revenue rate by improving the efficiency of the production process and raising the current price of their product. That is because of the limited funds and company scale obstruct Stella Polaris from moving up in the supply chain, and the simple product structure limits its product innovation. However, Stella Polaris expands its revenue channel by reutilizing the residuals in the production process. By processes the prawn shells into blood pressure medication, Stella Polaris turns the residuals into things of value. While saving the cost of disposal the waste, also increase the profit.



Figure 41 Blood Pressure Medication Made of Prawn Shell

5 Conclusion & Future Study

5.1 Conclusion

After described and analyzed the structure and components of different kinds of business models in the literature review part, I have created a new business model framework which aims to help small and medium-sized manufacturers in sparsely populated areas in Northern Norway to obtain and keep competitive in the market. First, the new business model is in a hierarchical structure and has two levels. In the first level, the business model is separated into four components: customer segment model, value proposition model, value capture model and value delivery model. These four components constitute the base structure of the new business model and describe how it help small and medium-sized manufacturers to satisfy customers and generate profit. In the value proposition model, I explained the different between USP and UVP. Then expounded the importance of USP and the process of how companies can develop their USP.

After the value proposition model, the customer segment model described the process of how a company segment its customer bases and identify its target customers. The whole customer segment model was separated into three sub-process: customer classification process, customer value evaluation process, and customer segment process. The three sub-process of the customer segment model gives a guide for companies to segment its customer base and is convenient for enterprises to make distinctive and targeted business strategies to satisfy different customer segmentation and maximize the profit.

In the value capture model of the new business model, there are three sub-components: resource model, cost model, and pricing model. The resources model describes different kinds of tangible and intangible resources that essential to manufacturers' business activities, and then introduces various methods to manage and improve the utilization of resources. In the cost model, by introducing the product lifecycle cost theory (LCC), I listed different kinds of cost and described how to use different methods to reduce the cost in various stages of the product lifecycle, such as closed loop supply chain method. Then in the pricing model, I suggested manufacturers should price their product according to the different lifetime stage in the market and introduced some pricing methods.

The value delivery model of the new business model aims to guide the small and medium-sized manufacturers how to deliver the value that they created in the value capture model to the target customers. I separated the whole value delivery model into three subcomponents: partner network, distribution channel, and revenue model. In the partner network section, I divided it into different aspects and described how manufacturers can choose and manage the relationship with various kinds of partners. In the distribution channel model, I split it into two parts: the sourcing model and the marketing channel. The sourcing channel described the relationship between raw material suppliers and small and medium-sized manufacturers and provided guidance about how small and medium-sized manufacturers can find suitable material suppliers. Then in the marketing channel model, I analyzed the limitations and vulnerabilities of small and medium-sized manufacturers in sparsely populated areas in northern Norway, and listed several optional marketing channels, their advantages and disadvantages are also discussed in this paper. In the revenue model, I provided guidance that how small and medium-sized manufacturers can improve their existing revenue model and expand revenue model by reusing the residuals.

Besides, at the end of this paper, I also add a case study of Stella Polaris, by analyses Stella Polaris' successful case from the different aspect I mentioned in the business proposal part, my viewpoints are supported.

5.2 Future Study

This thesis gives a general business model framework for small and medium-sized manufacturers in sparsely populated areas in northern Norway, but still only remained at the framework level and had not continue study in depth. When so many different factors are taken into considered, it may not be suitable for all the small and medium-sized manufacturers. Thus, each component also needs to be systematically studied and modified to find the most adequate and targeted choices, methods and strategies for different companies.

In the value proposition model, the further study should focus on refining the USP development process to make a detailed guidance. In the customer segment model, the next research orientation is to find out the connection between the emphasis of customer characteristic research and the difference in products.

For the resource model, the further study should lay emphasis on how to expand and manage the supply channel of different kinds of resources. The cost model needs to add or delete some cost classifications to fit in various manufacturers' businesses. Besides, the cost reduction process also needs to be refined. In the pricing model aspect, the further research orientation is to make sure the connection between the different pricing strategies and different market situation.

Following researchers also need to deepen the study of value delivery model. In the partner network model aspect, following researchers should lay research emphasis on refining the partners choosing process and how to manage the relationship with them. In the distribution channel model aspect, the future study needs to focus on the details of sourcing and marketing channel, and the connection between the enterprise scale, economic scale of manufacturers and channel selection. Such as in what kind of market situation and until manufacturers grow to what level, it is suitable to open up retail stores. Last, in revenue model aspect, the orientation of further study is the connection between different market situation and different existing revenue improvement method. The waste recycling system also needs to be modified and systematized.

Besides, for objective reasons, there is only Stella Polaris' case in the case study part. As the company size, the leading position in the industry, economy condition and some other factors, there are some contradictions between Stella Polaris' business strategies and mine. That is not mean that the business model I put forward is not suitable for small and medium-sized manufacturers in Northern Norway. In the further study, we can add cases of various companies into analysis and study from alternative perspectives to develop more appropriate and detailed business models for companies in different business situations. In addition, there is just a brief overview of the relationship and the mutual effect among the business model modules in this report. The further study also requires deep-going research to discuss the connections between the modules and find the most efficient combination of different business model modules.

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Appendix

Appendix 1. Interview Guide

VALUE PROPOSITION

1. What is your value proposition? What is your SVP? Why the customers prefer your product rather than your competitors?

2. How you develop your value proposition and SVP?

CUSTOMER SEGMENTATION

1. Who is your target customer? How you segment your customers? What kinds of characteristics is important to you when you choose your segment the customers?

2. After the customer segmentation process, what is your strategy to treat different customer segments? Where your focus will be?

RESOURCE MODEL

1. How you classified your resources? How you improve the resource utilization?

2. How you exploit and manage your human resources?

COST MODEL

1. What is your cost breakdown structure? How you classify your different kinds of costs?
2. How you reduce different kinds of costs?
3. Do you have a closed loop supply chain? If so, how it works? How do you deal with your industrial residuals?

PRICE MODEL

1. How you price your product? How do you determine the markup?
2. Under what circumstances there will be a price change?

PARTNER NETWORK

1. How you choose your suppliers? How many suppliers do you have? What do you most value in your suppliers? You prefer large suppliers or small suppliers?
2. Do you have a cooperation will retailers? How you find them and why they prefer your product rather than your competitors'? What do you most value when you choose the retailers?

3. Do you have cooperation partners? What do you most value when you choose and cooperate with them?

SOURCING CHANNEL

1. When you sign the supply contract with your suppliers, what kinds of requirement you need to discuss?
2. Do you have a portfolio contract?
3. Do you have a design collaboration with your suppliers?

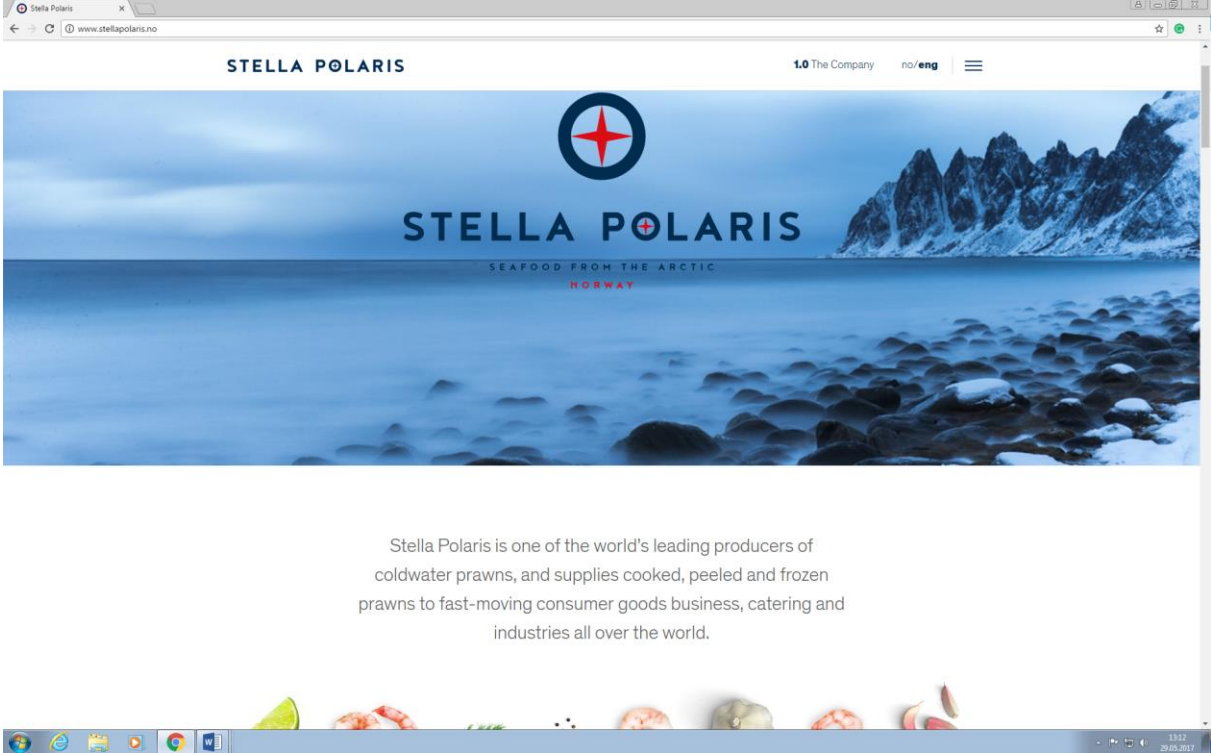
MARKETING CHANNEL

1. What is your marketing channel?
2. You prefer to online selling or open up retailer stores? If set up retail stores, you prefer to set up your own retail stores or cooperate with local retailers? If online selling, you prefer to run your own website or cooperate with other websites like eBay?
3. Which one do you value most when you design your marketing channel? Response time, Product variety, Product availability, Customer experience, Time to market, Order visibility, Returnability, or Cost?

REVENUE MODEL

1. How you generate revenue? Do you have any ideas about how to improve the existing profit like raising the price?
2. Do you think the cost of disposal industrial residuals is too high for you?
3. Do you have a cooperation with other companies to sell your industrial residual to them as raw materials? If not, how you disposal the residual?

Appendix 2. Stella Polaris Website



Appendix 3. Statistics Norway Website

