



Engineering Faculty

## Bachelor Thesis

# **SCM improvements in Mongolia based on the example of the Pick Indicator System**

A case study for improvement of the effectiveness of the order fulfillment output within  
the DC of a neighborhood store franchise in Mongolia

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16th May 2022

## Statutory Declaration

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I hereby affirm in lieu of an oath that I provided the submitted bachelor thesis

**SCM improvements in Mongolia based on the example of the Pick Indicator System**

A case study for improvement of the effectiveness of the order fulfillment output within the DC of a neighborhood store franchise in Mongolia

I did not use any sources other than those stated. In case that the work is additionally submitted on a data medium, I declare that the written and the electronic form are completely identical. The work was not submitted in the same or similar form to any examination authority.

Ulaanbaatar, 2022.05.16

Place, Date

Signature



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# Abstract

This bachelor thesis aims to study and describe how Central Express CVS LLC manages and operates its convenience store business mainly focusing on the distribution, DC order fulfillment, and warehouse management which supports the store chains' activities and further improvements in the supply chain is mentioned. Convenience store business is new to Mongolia and brands such as CU, Circle K, GS25 are competing to get the market share of the sector to themselves by improving their operation, service, size and more. Having products available in stores is the core of the business and the distribution of goods from the distribution center to store lacks efficiency and effectiveness due to the preparation of multi numbers of store replenishment orders. Qualitative method is applied to the research and data is collected from the interviews with parties that is involved with CU in Mongolia. Secondary data is retrieved from reports, publication sources, information system and internet. Data analysis is done by the literature chapter and based on the analysis, the conclusion is written.

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# 1. Introduction

## 1.1. Background

In modern days' competitor challenges in consumer goods, the manufacturers are striving for their products to reach final customers before they compete with rival companies. This challenge is influenced by many things such as lack of well-developed distribution networks, local industry dynamics, new business comers, etc.

Retailing is one of the important parts of economic activities that cover both developed and developing countries' economies, with wholesaling and retailing value-added. "The primary goal of the retail industry or retail merchandising system is to influence possible consumers to purchase a particular product assortment at a particular retail store" (cited in Risch, 1991). Retail activities are creating an important role in supply chain management and logistics.

"A convenience store is a part of the retailing business as it is one type of store format, and from the consumer's view, convenience is the minimum level of financial, physical, and mental expenditures needed for customers to overcome the friction of time and space in shopping" (cited in Risch, 1991).

CU is a South Korean convenience store chain formed in 2012 by the owner company BGF Retail and it continues to grow its store chain since then. In 2015, a Mongolian company named Premium Group Ltd launched their first convenience store chain called "Central Express" with three stores working, and later in 2018, the Mongolian company made a contract and received the master franchise with the South Korean company to launch foreign convenience store chain in Mongolia. As of February 2022, CU has opened 187 stores in Mongolia and planned to expand the number of branches from 200 to 240 by the end of the year 2022.

## **1.2. Problem Statement**

This study is focusing on only the retailing industry and retailing convenience stores' perspectives in Mongolia. The subject was studied by using CU as a reference.

Retail convenience stores that opened in Ulaanbaatar are expanding rapidly. Keeping up with demands and having the products available to consumers is a problem each store chain has. "Retailing and distribution are concerned with product availability and retailers must be concerned with the flows of products and information into and through their companies to make products available to consumers" (Spark, 1998).

In Mongolia, convenience store businesses use the centralization of stocks and use technologies and IT to facilitate logistical efficiencies in the distribution network. The technologies are material handling and IT is the flow of information through the supply chain. Gattorna and Walters (1996) mention that "communication and information management are essential for decision making".

## **1.3. Purpose of the Study**

The purpose of this study is to, from a retailing convenience store's perspective, identify and describe how a convenience store chain in Mongolia manages and operates its' retail convenience business focusing on distribution, DC order fulfillment, and warehouse management, which supports the store chains' activities. By doing so, it explores further improvement in the supply chain.

## **1.4 Focus and limitations**

The study scope is limited by focusing on a single case which is CU convenience stores in Mongolia. This thesis will focus on topics, mainly on the replenishment of goods according to the orders they receive from the convenience stores. Furthermore, research focusing on the

improvement of replenishment efficiency will be done based on what operational procedure the company uses in the current situation.

The interviews will be done by telephone, email, face-to-face, and internet communications and data will be collected from any source.

## 1.5 Disposition

The overall of structure of the thesis is presented in a form of chart below:

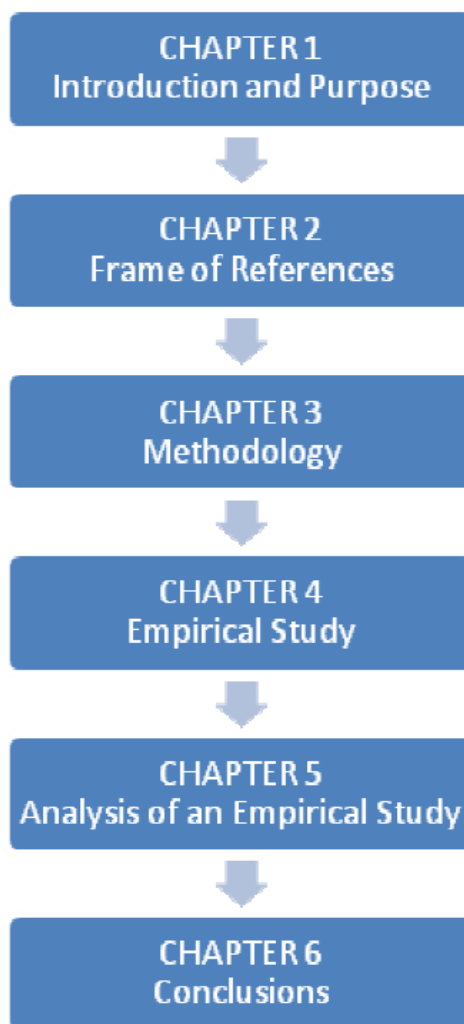


Figure 1.1: Outline of the thesis

Chapter 1 - In this chapter, background related to the subject of this research is presented. The problem statements are stated and lead to the purpose of thesis. Focus and limitation in order to define the scope and to outline the study is provided.

Chapter 2 - In this chapter, frame of references related to the study is provided, which is used through thesis. The theories obtained from literature reviews sets the analysis of the empirical study are presented within the choice of theories. Then each theoretical framework concerned with each dimension is presented.

Chapter 3 - This chapter introduces research strategies and research methods used in this article. The method is mentioned and defined as well as the strategies which is used in the research. Details of data collection is also given.

Chapter 4 - This chapter presents the empirical study. The issues relating to the subject studied, which are the business preview, and the operation from many perspectives, are described. The focus of this chapter is to capture and present the case study as a whole.

Chapter 5 - The analysis of an empirical study is done in this chapter. The analytical part will be done by using the framework of references in chapter 2 and the method cited in chapter 3.

Chapter 6 - In this chapter, summary on the entire research thesis; discussion on the analysis part the answer to the purpose of thesis is clarified.

## **2. Frame of Reference**

### **2.1. Choice of Theories**

The thesis concentrates much in Central Express CVS supply chain, specially how supply chain management works in delivering products to consumers. Therefore, three main parties are involved: suppliers, DC, and the stores. First, the competitive advantage with the supply chain, explanation of the connection of market and firms' strategic management and how they lead to competition will be done. Second, the importance of logistics, distribution, and the linkage of

these elements to marketing in retail industry will be done. Third, warehouse and DC working process and theoretical frameworks on the IT, which connects the chain members will be done.

## **2.2. Competitive Advantage within the Supply Chain**

Competitive advantages are important as it creates customer value for the firms. Firms deliver services and products to customers which exceed their expectations and have more possibilities to sell. According to Holcomb (1994), supply chain management now has an emphasis on shaping competitiveness and profitability (cited in Tracy, Lim & Vonderembse, 2005). Strategies that firms create to gain a competitive advantage are easy to imitate by competitors but, the competitive advantages that are routed from the chain efforts are not easy to copy. An effective supply chain, thus, offers the opportunities to create sustainable competitive advantages (Cooper et al., 1997; Higginson & Alam, 1997 – cited in Tracy et al., 2005).

As the supply chain is used to achieve a competitive advantage and drive more customers, all members of the supply chain are required to synchronize their strategies directed to the end-users which are the consumers. This means the SC strategy and competitive advantage need to link up to the customer priorities. According to Chopra and Meindl (2007), firms can design supply chain in delegating tasks as to outperform the competition by matching the competitive advantages the supply chain have with what of the customer desire.

## **2.3. Warehousing and Distribution Center**

“Warehouse and distribution centers (DCs) are important nodes in a supply chain network; they perform valuable functions that support the movement of materials, storing goods, processing products, de-aggregating vehicle loads, creating SKU assortments, and assembling shipments are all activities commonly performed in these facilities” (Langevin & Riopel, 2005). These are the common activities that are performed in warehouses and distribution centers. “Major challenges that DCs and warehouses are having are related to workforce issues which include staff training, scheduling, and job design” (Ackerman & Brewer, 2001-cited in Kotzab & Bjerre, 2005).

The difference between a warehouse and DC is that the warehouse stores goods, while the distribution center is set up to be a post-production warehouse for finished goods held for distribution. Therefore, they have the same function to store goods and products.

### **2.3.1. Warehousing**

Warehouses store all products in four-cycles, receive, store, pick, and ship (cited in Higginson & Bookbinder 2005). The firm can decide and select among the different kinds of specialized storing facilities, and the right choice might assist the firm in reducing costs and serving customers better (cited in Perreault & McCarthy, 2003). The usage of specific types of storage facilities aims to reduce costs and ease the distribution or the operation to increase the service level to the consumer.

**Private warehousing** is a storage facility owned or leased by the company for its use, additionally, most manufacturers, wholesalers, and retailers have some storage facilities whether in their main building or different separate locations (cited in Perreault & McCarthy, 2003). Perreault and McCarthy (2003) pointed out that companies use private warehouses when a large volume of goods and products must be stored regularly otherwise, private warehouses are expensive when dealing with changes needed as it is difficult for the extra space to rent to others.

**A public warehouse** is an independent storing facility. A public warehouse usually provides all services that a company's warehouse can provide (cited in Perreault & McCarthy, 2003). Perreault & McCarthy (2003) also mention that public warehouses are helpful for manufacturers who are required to hold stock in different locations. The first and most significant reason for using a public warehouse is financial; it requires no or limited capital investment by the company (cited in Coyle et al., 2003).

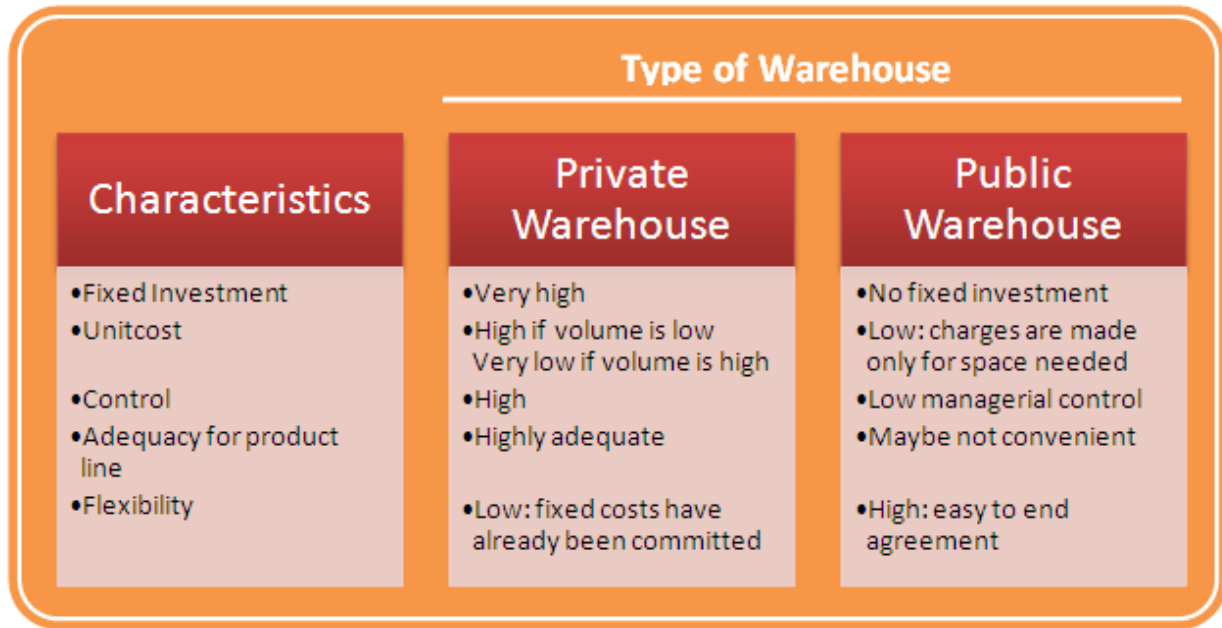


Figure 2.1: A comparison between Private and Public Warehouses.  
Source: Perreault & McCarthy, 2003

### 2.3.2. Distribution Center

Unlike a warehouse, a distribution center could be a kind of warehouse designed to form the flow of products faster and avoid having unnecessary goods stored. Today the distribution center concept is widely employed by firms in any respect channel levels and also many products buzz through a distribution center without ever tarrying on a shelf, workers, and equipment immediately sort the products as they are available in hand subsequently move the products to an outgoing platform, then to the vehicle which is able to take the products to next stop (cited in Perreault & McCarthy, 2003).

The distribution center handles its product in two ways which are receiving and shipping and also, DCs hold minimum inventories and predominantly, high-demand items (cited in Higginson & Bookbinder, 2005). Nonetheless, many of the works mentioned are using the 2 terms, warehouse, and DC.

Since the 1980s, three supply-chain trends have had a significant impact on the distribution center (cited in Higginson & Bookbinder, 2005):

- Reduction within the number of warehouses;
- Greater emphasis on the flow of products instead of their storage;
- Increases outsourcing of warehouse/distribution center activities.

### **2.3.3. Warehouse/DC Operational and Facilities**

The basic warehouse operations are movement and storage (cited in Coyle et al., 2003).

Moreover, goods must be handled once putting them into storage and removing them again once they are to be sold (cited in Perreault & McCarthy, 2003). The warehouse also includes highly specialized storage facilities like bean and grain elevators and refrigeration facilities etc (cited in Coyle et al., 2003) furthermore as DC.

#### **2.3.3.1. Warehouse/DC activities**

More competitive markets, improved technology, coordination among firms, and efficient new distribution centers, those bring such a huge improvement to physical distribution, “physical distribution or PD is a common name for logistics which provides time and place utility and makes possession utility possible”, areas and yet biggest challenges may be more basic (cited in Perreault & McCarthy, 2003). A storage/order fulfillment or warehouse/DC operation has the following activities (cited in Coyle et al., 2003).

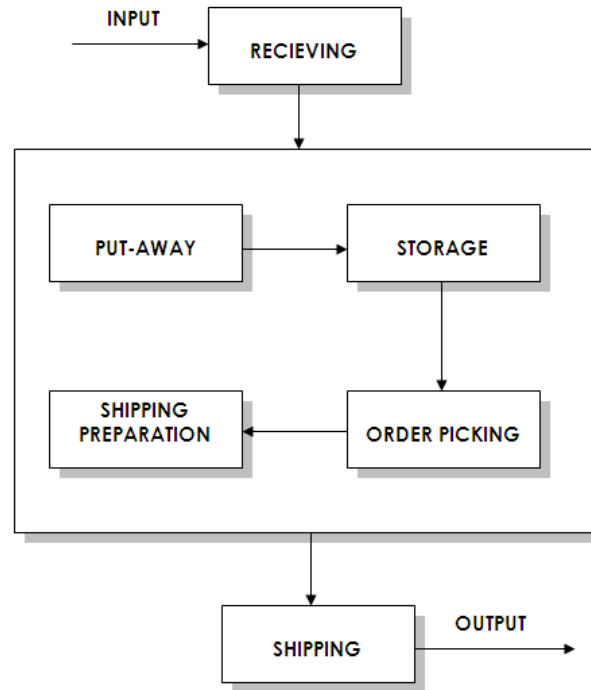


Figure 2.2: Basic Warehouse Operations  
Adapted from Coyle et al., 2003

1. Receiving operation - This operation means receiving supplies from suppliers according to the PO at the receiving zone. Received products go through a barcode scan and physical damage check before entering the storage zone.
2. Put-away operation - This process involves creating a put-away list, identifying the location where the product should go, and storing each product in the located storage bins.
3. Order-picking process - In this process, order pickers in the DC pick up the goods and products for TO made for each store. Picked orders are packaged in a plastic box designed for distribution.
4. Shipping process - Packaged boxes are shipped into trucks and distributed to stores.

### 2.3.3.2. Warehouse Management System (WMS)

Lots of companies are implementing a warehouse management system that assists the warehouse manager in controlling various warehouse operations, and tracking inventory or service to the customers at the lowest possible operational costs (cited in Coyle et al., 2003,

and Mulcahy and Sydow, 2008). WMS is a computer-aided software which enables tracking, planning, controlling, analyzing, and recording the flow of goods or products through the warehouse or the DC. Additionally, it eases the flow in many ways (Higginson and Bookbinder, 2005).

According to Mulcahy and Sydow (2008), some of the warehouse options are (1) Store and hold or conventional or (2) across-the-dock warehouse operation. Excluding those options, there are warehouse-type with different SKU, customer orders and information flows, which are the foundations for a future warehouse with the WMS program.

#### **2.3.3.3. Electronic Data Interchange (EDI)**

Another information technology, which has a major impact on firms in helping the flow of information is Electronic Data Interchange. This EDI has been used in the transportation industry for more than twenty years by mainly large shipping and railroad companies, freight forwarders, trucking companies, and others (Stefansson, 1999). Perreault and McCarthy (2003) state that EDI is an approach that puts information in a standardized format that is easy to share between different computer systems. Besides, the purchase orders, shipping reports, and other 18 paper documents are replaced with a computerized system.

With EDI, customers can transmit their order information directly to suppliers' computers. EDI makes communication easier for suppliers and customers and shortens order cycle time.

According to Kotzab (2005), three components of EDI are (1) EDI-Enabling Software, (2) Communications and Networks, and (3) Standard Messages. Using EDI-Enabling software to translate incoming and outgoing messages to a specific format ensures the electronic communication between the partners so that systems can exchange information in the highly demanded structure.

#### **2.3.3.4. Vendor Management Inventory (VMI)**

VMI is a supply chain strategy where the vendor or supplier is given the responsibility of managing the customer's stock (cited in Disney & Towill, 2003). Vendor-driven inventory is one

amongst the foremost widely discussed partnership initiatives to enhance the efficiency of a multi-firm supply chain. VMI is a business model in which the distributor/consumer of the product hands out information to the supplier of the product and the supplier is fully responsible for maintaining an agreed inventory of the material. (cited in Murray Martin, 2018).

VMI makes sure that the buyer has the required level of inventory by adjusting the demand and supply gaps.

### 2.3.3.5. Pick Indicator System

Order picking has long been identified as the most labor-intensive and costly activity for almost every warehouse; the cost of order picking is estimated to be as much as 55% of the total warehouse operating expense (cited in René B.M. De Koster, 2007). Any mid or lower performance in order picking can implement unsatisfactory service and high operational costs for its' warehouse or the DC, and further the entire supply chain. Therefore, to work efficiently, the order picking process needs to be designed and optimally controlled. Order-picking methods are split into two categories as shown in the following.

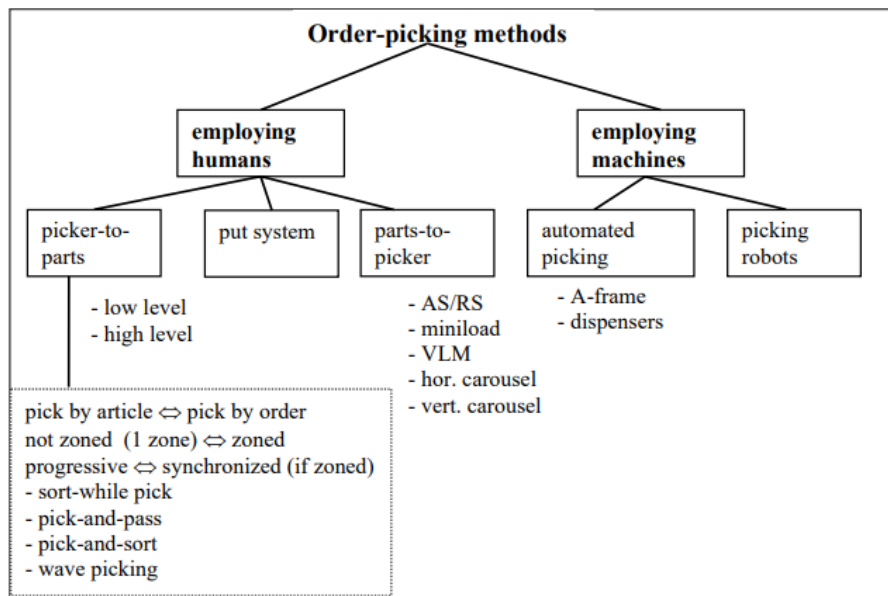


Figure 2.3: Classification of order-picking systems (based on De Koster 2004)

For this thesis, picker to parts will be discussed.

**Picker to parts** is a manual order picking method with the basic variants which include picking by article (batch picking) or pick by order (discrete picking) etc.

- Batch picking - The order picker picks multiple customer/stores orders simultaneously
- Discrete picking - The order picker picks one order at a time, picking an item line by line before changing to the next order

To enhance the order picking efficiency on picker to parts, the pick indicator system has been selected on CU in Mongolia's case.

According to a study done by Mintel (2019), almost 90% of UK shoppers use Amazon and 40% have access to its Prime subscription service. Amazon, the retail giant started its business by selling books, it has expanded to become the one first in line for consumers to call when buying everything. Due to the size and complexity of its operations, organized and efficient warehouse solutions are a necessity. With having thousands to millions of items to pick from, there is no time for inaccuracy or mistakes. Having solutions for improving the speed and accuracy of operations is essential to modern warehouses.

**Pick indicator system** - Its' either light directed or voice directed. A special type of pick indicator system is AR glasses which give a vision of direction, similar to VR tech shown in figure 2.6.

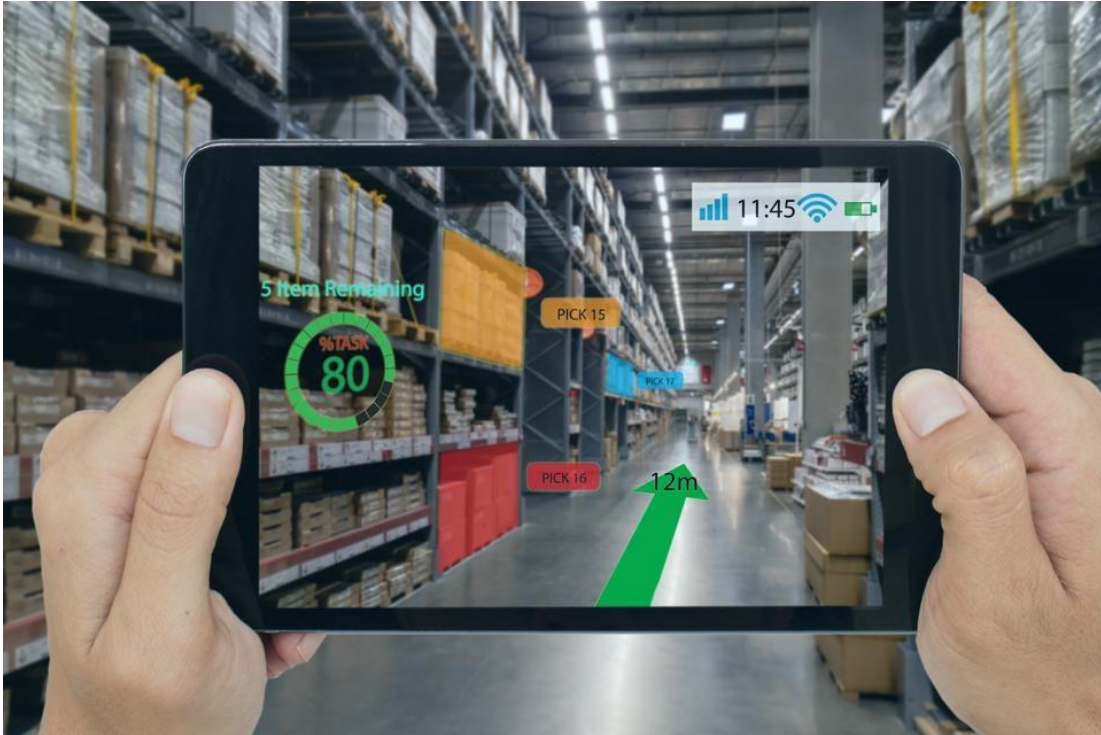


Figure 2.4: Augmented Reality (AR) in use on a tablet.

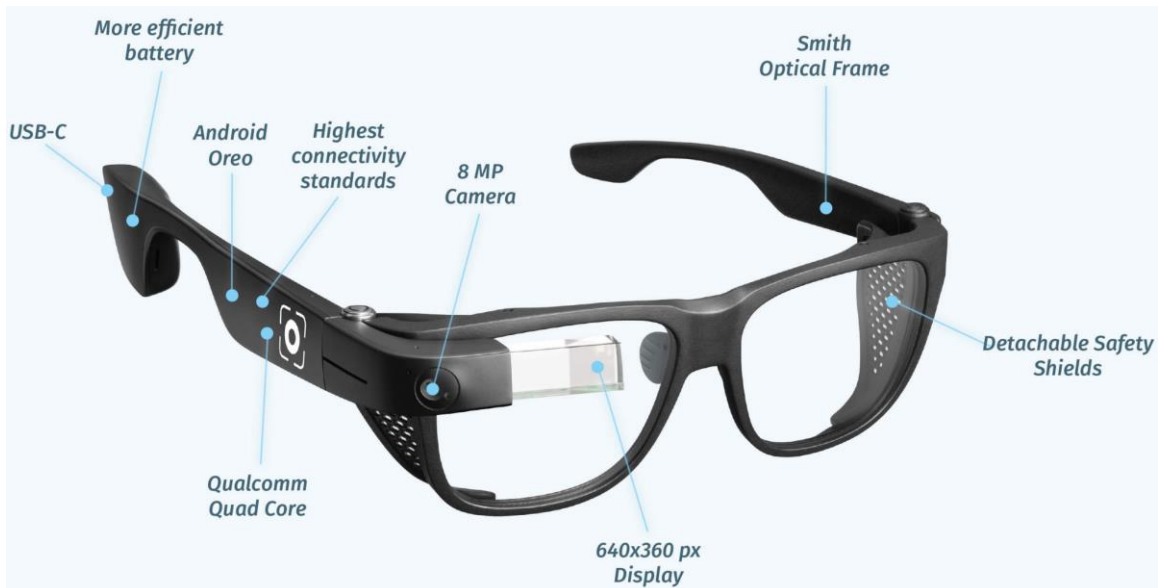


Figure 2.5: Picavi, Smart Glasses.

**Voice-directed pick indicator system** uses Artificial Intelligence (AI) to pick items. Pickers are equipped with a headset, hearing what item needs to pick, what amount of quantity is to pick, and where the item needs to be picked per order.

(1) The process begins with the picker scanning the order barcode. (2) AI tells the picker to go to the located bin number. (3) When arriving at the location, the picker sends out a signal to the AI, confirming that he/she arrived. (4) AI tells the picker the bin number, SKU number, and quantity. (5) The picker scans each picked items' SKU number and tells the AI, confirming the pick. AI tells the picker to go to the next located bin and process (3),(4), and (5) repeat until the scanned order is complete.

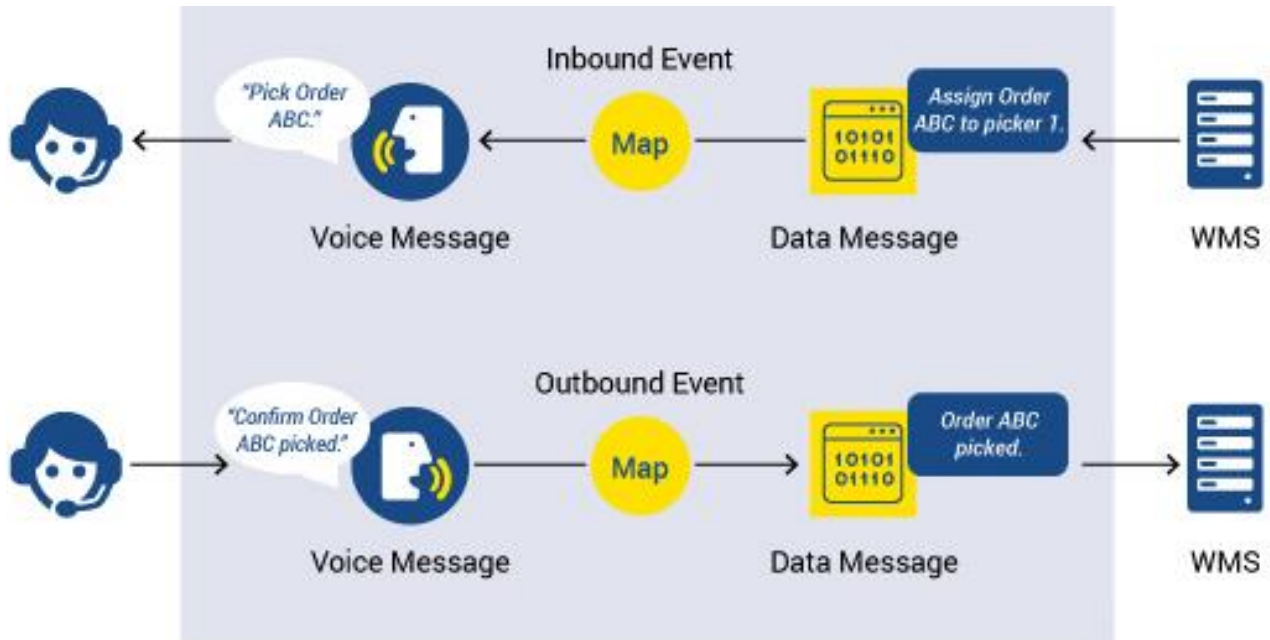


Figure 2.6: Voice Directed Picking system, Picking cycle

**Light-directed picking system** uses a light indicator that directs which item to pick and how much quantity needs to be picked. Each bin has a light emitting diode (LED) display on the shelf, lights up when an item needs to be picked from the bin, and shows the quantity of an item that needs to be picked. See figure 2.9.



Figure 2.7: Pick-to-Light system, LED display in use.

To make it more efficient, the pick-to-light system is combined with the Zone picking method. Zone picking can be applied to other solutions.

The process for the combination of Pick-to-Light and Zone picking begins by (1) separating shelves into sections. (2) Pickers are distributed into different zones and they are responsible for the pick order of their section. (3) Once an order barcode is scanned, (4) ordered items in a section are collected using the Pick-to-Light system and, (5) after collecting the ordered items in section 1, the order is transferred to section 2 where items in section 2 are collected before moving to section 3 and further. Items are collected in a plastic delivery box shown in figure 4.1 and the plastic box is placed on a conveyor. (6) The box is transported by the conveyor and ends up at the exit zone. See figure 2.10.



Figure 2.8: Pick-to-Light system and conveyor in use.

## 2.4. IT-Application for Retail Store Management

According to Carr (2004), Strategic management sees technology as a source of sustainable competitive advantage. Kotzab (2005) pointed out that technology can change the structure of an industry by setting entry and exit barriers. There are three basic types of technology (cited in Kotzab and Bjerre, 2005):

- Cais technology can be used by any individual with ease and it doesn't create an impact on the industry structure. Cais technology represents simple technologies for example IT in distribution is a fax machine that is used as information transmission, order transmission, etc;
- Key technology creates immense impact, especially in a specific situation in a market. Not every individual can or has applied this technology. An example of the key information technology for distribution is the EDIFACT (Electronic Data Interchange for

Administration, Commerce, and Transport) standards that accesses paper-free communication between the members of a distribution process.

- Pace maker technology has potential to influence the competitive situation of an industry. Referring to distribution, RFID or eXite are counted and used as relevant pacemaker information technology.

## 3. Methodology

### 3.1. Qualitative Research

Qualitative research finds information on the topics through the analysis of unstructured information, using things like interview transcript and recordings, emails, notes, feedback forms, photos and videos. Qualitative research does not rely on statistical numbers, which are the domain of qualitative researchers. Yin (1994) represents that by using qualitative methods, researchers gain insight into attitudes, behavior, motivation, culture or lifestyles. Focus groups, in-depth interviews, content analysis and semiotics are among the many formal approaches that are used.

According to Silverman (2007), there is an attempt to represent the different approaches within qualitative research. Gubrium and Holstein (1997) - cited in Silverman (2007) distinguish and criticize four different idioms.

#### Four qualitative idioms

Idiom	Concept	Preferred Methods
Naturalism	Actors, Meaning	Observation, Interviews
Ethnomethodology	Member' method for assembling phenomena	Audio/Video recordings
Emotionalism	Subjectivity, Emotion	Interview, Life histories

Postmodernism	Representation, Pastiche	Anything goes
---------------	--------------------------	---------------

Table 3.1: Four qualitative idioms

Source: Adapted from Gubrium and Holstein, 1997 –cited in Silverman (2007)

In this thesis, naturalism and ethnomethodology is employed and information will be corrected through observation and interviews by using phone, audio record, email and internet. Further, interviews with parties involved in the process of distribution in the selected case study will be done.

### 3.2. Case Study

A case study is an extensive examination of a single instance of a phenomenon of interest. It involves gathering detailed information about the unit of analysis with a view to obtaining in depth knowledge (cited in Collis & Hussey, 2003). According to Yin (1994), characteristics of a case study research seeks to find a certain phenomena and give understandings in a particular context. Multiple methods can be used to collect data which can be used to gain more opportunities in searching up the data to provide an analysis.

### 3.3. Collection of Data

The author uses two main data collections. First, the primary data will be collected from interviews. The secondary data gives supporting data to fulfill the gap from the interviews in this thesis.

#### 3.3.1. Primary Data

Primary source of data will be done by interviews and observations. According to Saunders, Lewis and Thornhill (2007), they present definitions of three types of interviews as:

**Structured interview:** Interviewer physically meets the interviewees, asks them the same set of questions in a predetermined order, and records their response to each.

**Semi-structured interview:** The interviewer covers a wide range of interview categories starting with a set of interview topics, but be prepared to change the question order, and ask new questions in the context of the research situation.

**Unstructured interview:** The loosely structured and informal interview begins with one or more topics to explore with participants, but no predetermined list of questions to work on.

In this thesis, unstructured interviews are applied to retrieve primary data. Respondents are involved in the day-to-day operations of the DC. Interviews are done physically and by telephone.

Questions about the working process and the flow of product are raised. The respondent also gives reflections about the ways that help the performance.

### **3.3.2. Secondary Data**

Desk research approach is used on the secondary data. Desk research is the term that is used loosely, and it generally refers to secondary data or that which can be collected without fieldwork (cited in Hague et al., 2004). Desk research uses the existing information from the website, company data and sources, directories, magazines, or other published sources (cited in Yadin, 2002).

The author gathers data from the company employees, weekly reports, and other materials which are collected during the internship.

### **3.4. Analysis Empirical Material**

Researcher can increase the quality of the analysis by dividing data into three phases: data deduction, data display and conclusion drawing, and verification from the presented material (cited in Miles & Huberman, 1994). In this thesis, the data collected will be evaluated by the three phases. According to Miles and Huberman (1994), the noted and recorded data is shortened, simplified, and compiled on the first phase of reduction.

After the interviews, all interviews are transcribed into written text. Data reduction is made before the collection, questions are selected selected and given to the participants only relating to the research purpose and objectives. In the second phase, data display can be as varied as the imagination of the analyst, and different analytical activities could be used to decide which data will be used in which form that is going to enter. Third phase, the modified materials are analyzed then conclusion is drawn.

### **3.5. Validity and reliability**

In this research, it proposes whether the interview has measured in the right way, all interview questions have been correct and consistent with the purpose and purpose of the research. This research uses many sources of information, and all are checked before including them in the thesis. Interviews are conducted with people to gain insightful data. The interview and secondary source data are compared to confirm the reliability. To get higher reliability, the authors ask the interviewees to let them confirm their answers. Therefore, this research is valid and reliable.

## **4. Empirical Study**

### **4.1. Business Preview**

Central Express CVC LLC established the first convenience store in Mongolia in 2017 and today, the convenience store market became one of the fastest-growing sectors in the retail industry. As of today, CU holds the market dominance in the retail convenience store in Mongolia with over 70%.

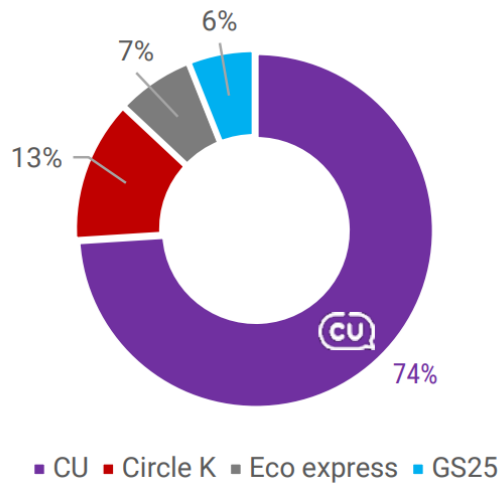


Figure 4.1. Retail Convenience Store Brands in Ulaanbaatar

With the market dominance, CU (Mongolia) continues to expand its store branches in Ulaanbaatar. As of June 2021, there are 172 convenience stores from 5 brands operating in Ulaanbaatar and Central Express CVS leads the market with 127 CU brand convenience stores, Circle K brand has 22 stores, Ecoexpress has 12 stores, Vpoint brand exited the market recently falling to 0 stores and GS25 brand has 11 stores.

**Number of convenience stores**

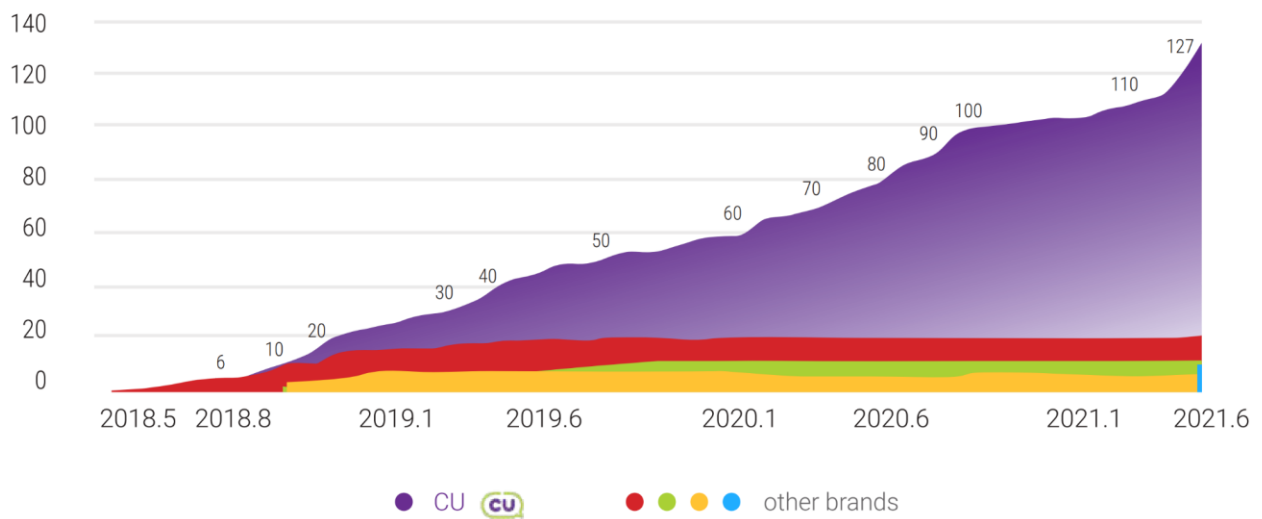


Figure 4.2. Number of convenience stores by brands in UB

After the IPO for a 15% share of the company, Central Express CVS plan is to expand the number of branches up to 360 by year 2025.

Based on the income and consumption level, the convenience store market size in UB is 12.6 trillion MNT and it is expected to reach 23.9 trillion MNT by the year 2026. Central Express CVS generated a revenue of 45.3 billion MNT in 2020 and 94 billion MNT in 2021, which accounts for about 0.4 percent of the market in 2020 and 0.8 percent of the market in 2021.

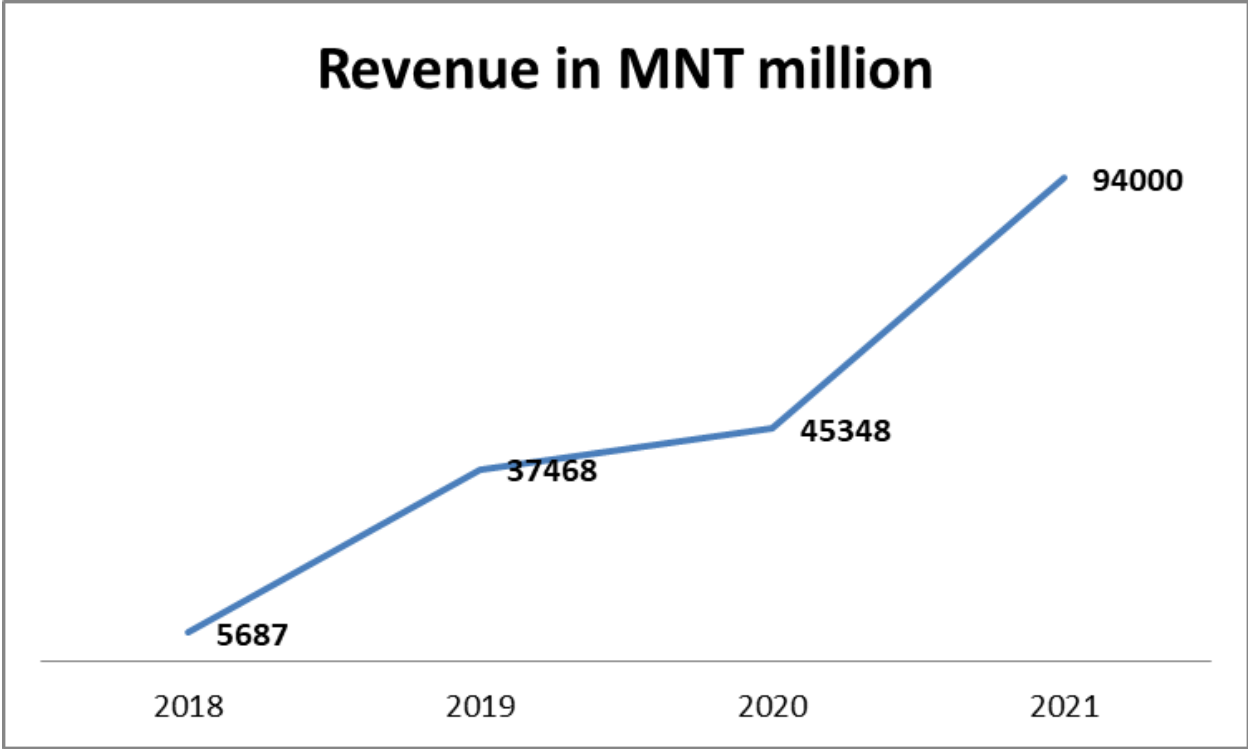


Figure 4.3. Central Express CVS Revenue in MNT million

The company aims to bring simpler, smarter products and services to the market, by opening new located stores that are close to their customers. For this, 5 mid-term strategies are followed.

- **Market dominance strategy** - Open stores in the best locations ahead of the competition
- **Vertical integration strategy** - Creating competitive advantage through a managed infrastructure which includes distribution infrastructure, food production center, and comprehensive IT system

- **Product differentiation** - Boost sales and profit simultaneously which includes name branding, exclusive products, import products, trendy products, unified service center
- **Increase loyal customer base** - Promote repeated purchases which include friendly service, loyalty program, and rewards
- **Increasing sales channel through technological advancements** - Create values through technological solutions.

## 4.2. Order Fulfillment

The convenience store business aims to maximize sales per square meter in the most densely populated areas; thus, it operates in a relatively small space compared to traditional grocery stores. To ensure consistent product availability, the company provides integrated inventory management which includes monitoring, storage, distribution, and delivery. The distribution centers receive over 3,500 types of products from over 500 suppliers to deliver to CU chain stores.

### 4.2.1. Order fulfillment process from DC to stores

For every order made from the stores, orders are collected in an order line which is the number of lines in one order. Each line represents one type of product with a certain amount of quantity e.g. If a store order has 20 order lines per day, this means there are 20 other types of products with different amounts of QTY that needs to be delivered per day.

The order fulfillment process starts with DC managers receiving the order lines to check if the ordered products are available in the DC. If the products are not found in the DC inventory list, the DC manager creates an order of the missing product to the ERP system. After the check-up, order lines per store are printed to a picker by the farthest located stores being picked first and the nearest located stores being picked last in the DC. The picker picks up the order lines, packages, and ships them to the distributing trucks store by store.

Packaged orders are shipped to the distributing trucks by having the farthest store orders shipped in the back of the trunk and the nearest store orders shipped in the front.

Distributing trucks deliver the orders to the stores and store managers carefully confirm the ordered products if they match the orders they made. If matched, the store manager signs the order paper and hands it to the distributor, and the distributor hands the signed paper to the DC manager for confirmation. If the products don't match the order, the mismatched products are transferred back to DC.

Date	Average (Oct 18 - Nov 13)
BP store numbers	191
Actual store number	148
Stores that made an order	97
BP order line	26987
Actual order line	7894
Completed order line	4424
Number of pickers	26
BP productivity (Order Line/Number of pickers*number of days)	611
Average productivity (Order Line/Number of pickers*number of days)	336
Max productivity (Order Line/Number of pickers*number of days)	589
Min productivity (Order Line/Number of pickers*number of days)	125

Table 4.1. Order line fulfillment from Oct 18 to Nov 13

This table shows the information of the business plan numbers, actual numbers, and completed numbers of order lines. The average order line per store per day is 63 which means, there are 63 types of products with each product having different amounts of QTY that need to be shipped

to a store in a day. And from this table, we can see that 97 of 148 stores on average made orders for replenishment and there are 7894 order lines made and 4424 order lines have been completed and delivered to the stores.

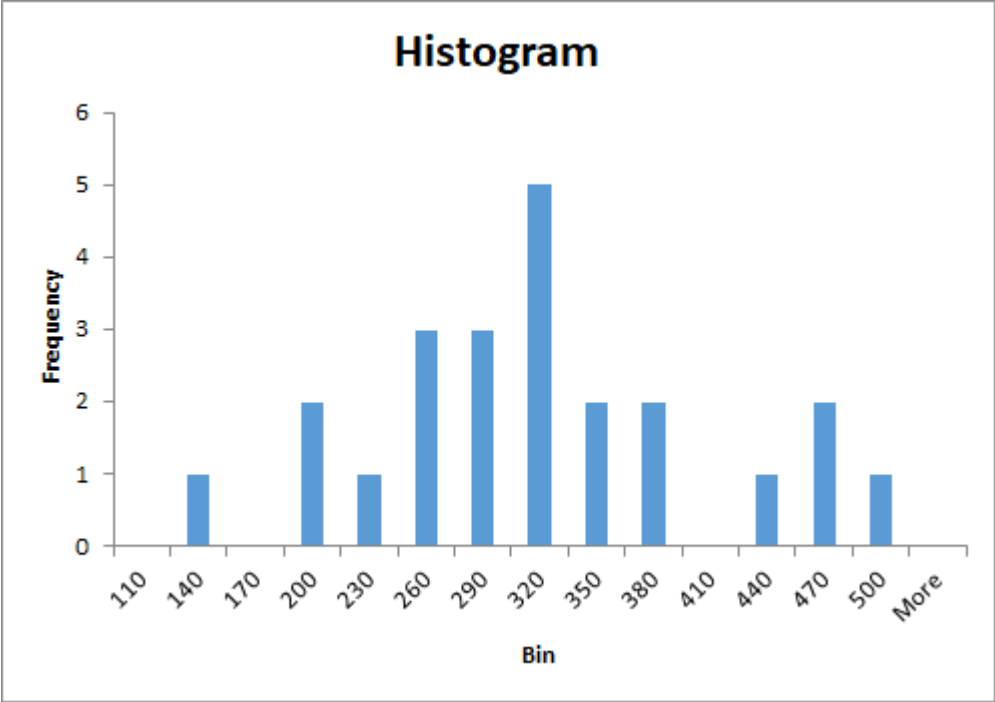


Figure 4.4: Frequency of order lines the pickers completed in a day

By collecting data from the weekly reports, order lines completed by workers is most frequent on 320. This shows the average order line a picker can complete in a day and by applying technological enhancement, this number can increase up to 500 or more.

### 4.3. Information Technology

#### 4.3.1. System at the store

Each store has the tools provided by the CU Mongolia company which are the point of sales system (POS) and store controller (SC).

Point of sales system (POS) allows the collection and storage of data when the products are purchased. When a customer makes a purchase from the store, the item information gets

transferred from the store computer and the time of the sale gets recorded automatically. This data is then transferred into the host computer and enters and updates the store controller system, showing how much inventory is left. The store manager is responsible for replenishment of products in-store using the ERP system and sends the order.

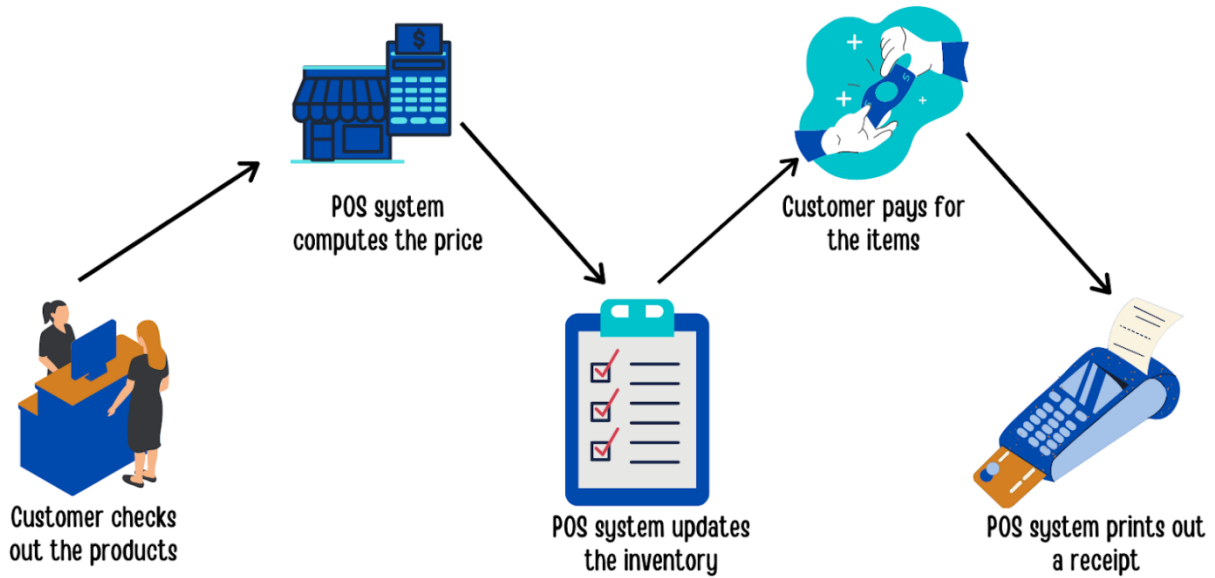


Figure 4.5: POS System procedure.

#### 4.3.2. System at the DC

Systems used at the DC focus on managing the orders of CU stores and relating transportation activities that require the DC to match the demand with internal utilization and capacity. For that, CU uses Microsoft Dynamics Nav which is an ERP software that assists with finance, manufacturing, supply chains, analytics, etc. All of the data is stored in a Database inside the head office and employees in the DC, head office, and stores exchange their data by using the internet network. Data input and output procedure is described in chapter 4.3 Logistics Activities.

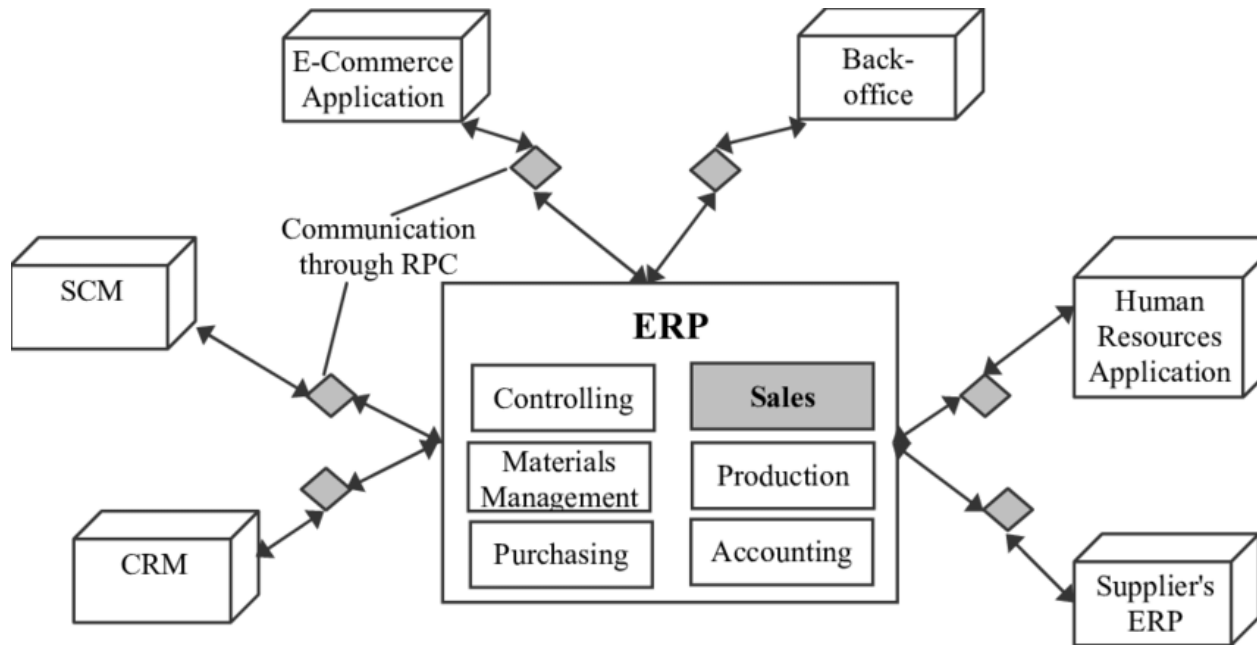


Figure 4.6: ERP system working diagram

### 4.3.3. Back office system

The back office system can be divided into three groups; Accounting System, Merchandise Analysis System (MAS) or the system used to administer sales, and Product Information Management System. (cited in Puapairoj, et al., 2009).

But in CU, accounting, merchandise analysis, product information management, and others mainly use Microsoft Dynamics Nav and Microsoft Office 365. Data information can be downloaded from the ERP system and manually edited by using Microsoft Office 365 and uploaded to the ERP by user IDs that have the access.

## 4.4. Logistics Activities

This thesis will mainly focus on the logistics activities from DC to stores. Logistics activities in the DC can be divided into two types which are inbound and outbound activities. Many activities are involved in and between DC.

#### 4.4.1. The inbound activities

Purchasing plan: The purchase plan is made by the purchasing department in the head office.

**Receiving goods:** The process begins with the supplier bringing the products to the DC's receiving zone, where the verification of the purchase order is done. To receive the products, certain requirements need to be met.

- PO in the ERP system needs to have a registry-issued number by the system.
- The storekeeper needs to make a warehouse receipt from the PO in the ERP system.
- Products need to match the barcode of the PO
- Invoice coming from the supplier need to include item description, quantity, barcode, unit price, total price excluding, and including VAT.
- Goods which is dangerous or poisonous need to include MSDS (Material Safety Data Sheet)
- Products need to have standard packaging, address, description according to the Mongolian current standards
- If the receiving product with an expiration day of more than 180 is left with less than 100 days, it is prohibited.

After the verification, the storekeeper creates a put-away list in the ERP system where the system formulates where the products in the receiving zone should be transported into the storage zone bins. Each number of products entering the storage zone is scanned by a barcode scanner and after storing, the storekeeper confirms the put-away list is completed and the products which were on the list are transferred into the available stock. If the product is damaged during the receiving and transferring process, the products are moved to the QC zone and delisted from the put-away list.

Storage activity: To store the products in the DC.

Inventory control: The products inside the storage are placed in different zones. Zones are divided by A, B, C, and D grade products, which are graded by their flow of speed.

- A Grade - The fastest moving item

- B Grade - Fast moving item
- C Grade - Slow-moving item
- D Grade - High-Value item

#### 4.4.2. The outbound activities

Shipping preparation: Before distributing goods from the DC, the following requirements need to be met.

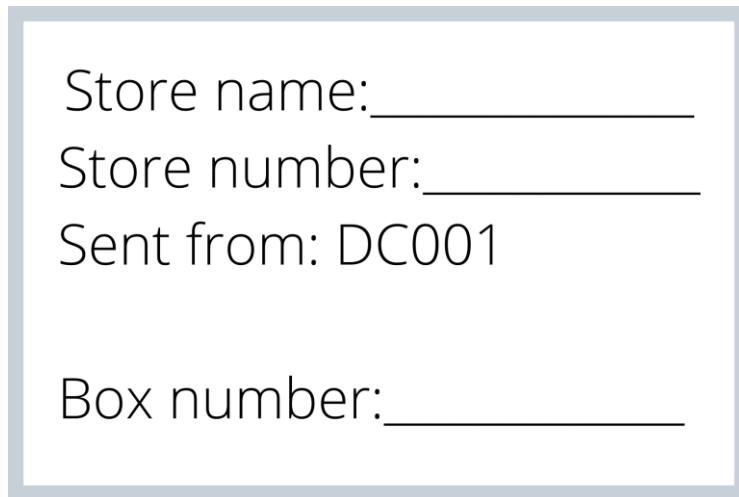
- Transfer order (TO) in the ERP system needs to be in “Released” status.
- Ordered products’ barcodes, item codes, and additional necessary information need to be valid.
- Order pickers need to attend an 8-hour training course on how to pick orders before working.

After the requirements are met, employees start picking the ordered products according to the following steps.

1. Order pickers need to create a pick-list in the LS NAV system
2. Order pickers start picking the products, using the FEFO (First Expiry First Out) rule.
3. Picked products need to be packaged in a plastic box shown in figure 4.1 and addressed according to figure 4.2.



Figure 4.7: Plastic delivery box for each convenience store.

A rectangular box with a light blue border containing a form for a delivery address. The form consists of four lines of text, each followed by a horizontal line for input. The first line is 'Store name:', the second is 'Store number:', the third is 'Sent from: DC001', and the fourth is 'Box number:'.

Store name: \_\_\_\_\_  
Store number: \_\_\_\_\_  
Sent from: DC001  
  
Box number: \_\_\_\_\_

Figure 4.8: Address template for a delivery box.

Shipping: Products leaving the DC exit through the exit zone. The order picker who picked the order hands out the products to the distributor with the “Posted Warehouse Shipment” document which later needs to be signed by the store manager, indicating that the products are distributed to the store and handed back to the DC.

#### **4.4.3. Distribution Center Management**

The successful cases of CU in foreign countries primarily from the role of supply chain management, where the linkage of each party in the chain is synchronously organized through the use of a distribution system and information system in the network. The key to delivering prior products and service lies in the value information from tracking and tracing of sales which enable the short replenishment cycle time for each store, the market analysis, and the accuracy of operation in a real-time manner. (cited in Nabajyoti, 2007, and The Nation Newspapers, 2009)

#### **4.4.4. Shipment, packaging, and transportation from DC to stores**

Due to the number of stores in Ulaanbaatar, the orders transported each day for each location give an effect of inefficient picking and shipment. Orders of each store have varied product quantities and types. To ease the process and increase efficiency in DC and the chain, the

company divides 2 kinds of packaging or the 'Case' to be shipped to the stores. (cited in Matichon Newspaper, 2007 and Puapairoj, et al., 2009).

- Full case - is a "Full packaged order", without having to unpack boxed supplies to get the required amount of product.
- Break case - is the opposite of a full case, which includes unpacking boxed supplies and collecting ordered amounts, later putting ordered types of products in a box for shipping.

Break case is often the main activity in DC because the orders coming from stores are on a break case basis. But, due to the inefficiency of the store managers, a full case is applied to products for replenishment. Normally store managers need to place orders to replenish store products but instead, managers deal with errors in the orders which include ordered products not arriving, not ordered products arriving, transferring products to DC due to expiry or other reasons, and using most of the time trying to solve the problem.

## **5. Analysis of an Empirical Study**

### **5.1. Competitive advantage within the Supply chain**

The studied company, Central Express CVS achieved a lot in the retail convenience business and the business format is very new to the Mongolian region. The result is shown in the empirical study that Central Express CVS is the biggest chain format convenience store in Mongolia and as well it is continuously growing and generating large revenues by each year. Competitive advantages of the firm can be retrieved by working collaboratively throughout the supply chain. By all manner of means, the business strategies applied to the chain must fit in the sense of market needs. It means that the supply design should give the result of operation matching or surpassing the market conditions, which is interpreted from the market perception that more value should be added to a product and the service compared to the competitors.

To start with the synchronized strategy at each level of the chain and in the CU, guidelines from Morash (2001) supply chain strategy, capabilities and performance is used to structure the analysis. The strategies alignment is discussed as follow.

### **5.1.1. Business Strategy**

As CU being a convenience store which aims to follow the international standards, it differs itself to a food convenience store with the convenience in the sense of location, availability of the products, services that's being provided, and time as it operates 24 hours a day, 7 days a week. The convenience of time and location along with the food and product availability is very new to the Mongolian region and CU took the name of the biggest numbers of store chain brand and continuing to grow their market dominance until the maximum capacity is reached in Ulaanbaatar and later in other provinces in Mongolia. Food is a perishable product but, it plays a big role in sales in the store, thus the high turnover and rapid distribution. In retail convenience store business, product availability is the key business success. The stores has to be able provide any product the customer wants regardless of time and place.

### **5.1.2. Supply Chain Strategy**

The supply chain strategy seeks to connect the overall chain character. Two ways of doing it are the operation excellence and customer closeness (cited in Morash, 2001), while the operation excellence focuses on supply side dependability.

CU chain in Ulaanbaatar does not differentiate itself from the bigger or the biggest convenience store chains in the foreign countries as in general, the foundation of the chain design is to have a efficient supply chain to give excellent service to the end consumers, while the uncertainty of demand pull at each store gives the prime impact on shaping strategy. The chain aims to create a reliable and dependable conditions in the operation to meet demands. The varied stores located at different locations have different demand due to density of people. The company currently deals with this by pure management and responsiveness of store demands.

Aside from that, space limitation at each store creates the responsibility to manage inventory efficiently. Quick response to the demands and accurate or precise replenishment at stores is needed. To give customers variety of choices for choosing product in a store, more products with less QTY is placed on the shelves. Depending on the flow speed of fast to slow moving or

not selling products, products are replaced by other products that generate more sales and reduce cost.

The more responsive chain, the more cost in operation (cited in Chopra and Meindl, 2007). But, from the convenience store point of view, relatively higher product prices are envisioned from the market. CU use higher product prices to fill the cost of the chain. An end consumer prepares themselves, knowing the added price in exchange for their convenience.

Excellent operation is the foundation for Central Express CVS to run the business and they are moving towards responsiveness to gain more competitive advantage.

### **5.1.3. Supply chain performance**

The operation between each function aims to facilitate the flows of materials, information, and finance effortlessly by the use of IT and DC.

The transactions are completed immediately as the distribution of products from DC to stores are done 3 to 4 times a day and the fill rate of the DC fulfills the minimum requirements but depending on the internal and external factors such as lockdown etc., over purchase from the suppliers or recruiting new employees for work is necessary to keep additional supply of goods to have products available in stores.

According to table 4.1 Order Line Fulfillment from Oct 18 to Nov 13, the average percentage of the products arriving at the store is 56%, and the percentage number is not reaching higher numbers. The reason behind it is that employment stability is poor due to the salary, and human resource for labor work is always needed to run the operation. The average monthly salary before taxes and social insurance is around 800'000 MNT (according to the distribution manager) which is not enough to cover the average living cost in UB.

Newly recruited employees in the DC go through a training program before working, and getting to know which products are stored which location of the DC takes time to catch on, and the time required to pick the ordered products has so many minutes to hours waste. Introducing an automation system such as a pick indicator system boosts DC output many folds for such work and requires less time to train employees to learn to use them.

#### **5.1.4. Sustain Competitive Advantage**

The competitive advantages Central Express CVS gained in the retail convenience store business are difficult to imitate by the competitors, thus the competitive edge is in a more sustainable manner. CU in Mongolia has collaborative supply chain and a flexible product distribution. By using IT, fluctuating demand at the stores is eased, thus inventory limitation and product availability is handled. Information transferred to the DC and suppliers allows future plans and operations in distributing goods effectively and versatile to the outlets. The ability to work cooperatively and boosting up the linkage of the supply chain enables positive chain and allow chain to function responsively to uncertainty.

### **5.2. Warehousing and distribution center**

According to the literature, distribution center makes huge effect in the company's performance. Business life cycle of CU in Mongolia is not yet to reach the stage of maturity and it's currently on the stage between growth and maturity. By running the business according to the international standards, CU in Mongolia rents DC which is considered as public warehouse. By having a DC, company can perform even better on the flow of goods and products to all stores and to end consumers.

#### **5.2.1. Effective and Efficient Distribution Process**

Warehouse and DC are the functioning passage between the supplier and the market. The passage consists of activities that facilitate and handouts products to the right spot at the right time. Having each suppliers deliver products store by store increases costs and is not efficient for a retail convenience store with a small square meter with any space for storage area. Having the suppliers deliver supplies to the DC which works as a warehouse gives the ability to sort products by what product is needed for which store. And, taking the time and money to sort the products and delivering them to the multi number of stores is more cost efficient and keeps the convenience store principle.

### **5.2.2. The Activities in the DC**

The main activities in the DC of CU, in general, are receiving the products, warehousing, and shipping them to stores with the ideal and desired order. The current situation of activities heavily relies on the employees who work at the DC. The assistance of the systems used in the DC has given the chain the ability to perform to the standard guides, and the work experience the employees have put into the company increases the productivity of the output. Information flows sourced from the market offer the chain on how the distribution center should manage their activities from the input to internal distribution center processes that includes put-away, replenishment, order picking, and loading, and output activity which is the shipment to the stores.

### **5.2.3. Technology Concerned within the DC**

Central Express CVS applies several IT systems to ease the communication and planning in DC as to aid every process and parties involved.

Central Express CVS uses IT systems to simplify the communication and planning in the DC as to improve every process and parties involved. From the stores, orders are collected and create listing in the ERP system. Back office analysis the data and creates new purchase orders to suppliers if the stock in the DC is low, and the DC picks the orders and distributes it.

In the DC, most of the work is done manually, for example, workers carry an order sheet with the products listed and, after picking the listed products of an order, the worker have to make a list into the ERP system, confirming what products he/she picked for the order of the store.

Items in the DC don't have locating bin number for each SKU. Some SKUs are in range from bin number A1 to A10, which makes the picker to search for the products and consume additional time. Currently, Central Express CVS does not use any technological enhancements such as pick indicator system etc., and by doing the work manually is time consuming, more complex, cost inefficient etc.

### **5.3 IT-Application for Retail Store Management**

IT applications in stores are the key component for retrieving valuable data from the market itself. It shows the trend of the market through the customers' point of view and gives what is needed for rapid and accurate service. The information collected from the consumers has made demand pull thinking more captive and achievable.

Data collected from stores creates competitive advantage to the company as it helps the supply chain in more seamless way, generating the integration and collaborative efforts in adding value to the goods. The analysis that can be made from the POS data are Sales Analysis of Product Categories over time, SKU analysis over time, Waste and Disposal analysis, Sales Trends by SKU, Sales analysis by day and time, Slow-moving items, sales and customer number overtime, reconcile data, etc. (cited in Dai, 2004, and, Harrison & Van Hoek, 2005). The core of these analyses is to create more sales and generate profit.

Moreover, CU stores help the company to create sustainable competitive advantage by using the collected data for marketing plan and strategies. IT benefits which the back office receive is that the ability to enhance operation level with less cost and time.

## **6. Conclusion**

This research aims to study and describe how CU in Mongolia manages and operates its convenience store business mainly focusing on the distribution, DC order fulfillment, and warehouse management which supports the store chains' activities and further improvements in the supply chain is mentioned. The case study

Central Express CVS LLC made a contract with the Korean company named BGF Retail to get the master franchise of CU convenience store brand and opened the first store in Mongolia in 2018 and as of June, 2021, there are 127 CU stores in Ulaanbaatar and it holds over 70 percent of the market share of the retail convenience store sector. The company partners with over 400 suppliers and has over 3500 types of products.

The company is growing size in store numbers and plans to open 360 stores by year 2026 but distribution difficulties in completing current store orders is a problem that the company is facing. The main problem for the case is that most of the work in the DC is done manually and

because of it, time waste is created and 8 to 9 work hours in a day cannot fulfill the amount of replenishment orders that is generated from sales in stores. Distributing packaged orders from the DC to stores is done 3 to 4 times in a day and for having the convenience for the customers; prices of products are higher due to costs to operate the convenience store business, when comparing it to bigger store chains.

IT technology such as Microsoft Dynamics NAV or ERP system and warehouse management methods are used in the DC for operation and for that, supply chain performance fulfills the minimum value of the required amount to have the products available in stores. Employment stability is unstable due to monthly salary and new recruited workers need certain amount of time to know which product is located within the DC which creates time waste.

Technological improvement such as pick indicator system is needed to eliminate time waste and increase efficiency of order fulfillment to give the chain further sustainable competitive advantages in the retail convenience store sector.

In conclusion, CU in Mongolia is the fastest growing retail convenience store brand that is expected to grow bigger and dominate the retail convenience store sector.

# 7. Appendix

## Appendix I: Abbreviations

DC	-	Distribution Center
SCM	-	Supply Chain Management
IT	-	Information Technology
POS	-	Point-of-Sale System
SC	-	Store Controller
WMS	-	Warehouse Management System
ERP	-	Enterprise Resource Planning System
VMI	-	Vendor Management Inventory
EDI	-	Electronic Data Interchange
SKU	-	Stock Keeping Unit/Units
MAS	-	Merchandise Analysis System
PIS	-	Pick Indicator System
CDC	-	Chilled Distribution Center
EOB	-	Electronic Booking Order
DSD	-	Direct Store Deliveries

## **Appendix II: Interview Questions with CU Mongolia**

How does the company decide on the location of the store?

Please explain the activities and system in the Distribution Centers?

What kind of WMS does the company use? How does it help firm's operation?

How does Information system help in firm's operation?

Are there any training programs for the staffs as well as the involve distribution actors in the chain?

Does the company have its own DCs or warehouses? What are the types of ownership?

Which of Retail format and retail strategy does the company most focus?

What is the lead time the suppliers take in delivering product to DC and the lead time from DC to the stores? Is there any difference with each supplier and each store?

## Appendix III: Interview Information

Name	Company	Position	Type of Interview
Solongo	Central Express CVS	Ex-Supply Chain Manager	Telephone, Physical
Otgon	Central Express CVS	Distribution Manager	Physical
Tsetsegdari	Central Express CVS	Purchasing Department Associate	Telephone, Physical
Tsevelmaa	Central Express CVS	Chief Operating Officer	Physical

## 8. References

1. Sparks, L. (1998). The Retail Logistics Transformation: insights onto current practice and trends from leading experts. In J. Fernie & L. Sparks (Eds.), *Logistics and Retail Management*. London: Kogan Page
2. Ernest, H. R. (1991). *Retail merchandising*, 2nd edition, New York: Macmillan: Maxwell Macmillan International
3. Langevin, A., & Riopel, D. (2005). *Logistics system: Design and optimization*, In: Higginson, J.K., & Bookbinder, J.H. (Eds), *Distribution centers in supply chain operations*, New York: Springer.
4. Kotzab, H., & Bjerre, M. (2005). *Retailing in a SCM-perspective*. In Kotzab, H. (Ed.), *Retailing the context of IT and distribution*. Copenhagen: Copenhagen Business School Press, 2005
5. Kotzab, H., & Bjerre, M. (2005). *Retailing in a SCM-perspective*. In Kotzab, H. (Ed.), *IT application in retail store*. Copenhagen: Copenhagen Business School Press, 2005
7. Perreault, W.D., & MaCarthy, Jr. E. J. (2003). *Essential of marketing: global-management approach*, (9th ed.). In Perreault, W.D., & MaCarthy, Jr. E. J.(Eds). *Logistics and distribution customer service*. Boston, Mass.: McGraw-Hill/Irwin.
8. Perreault, W.D., & MaCarthy, Jr. E. J. (2003). *Essential of marketing: global-management approach*, (9th ed.). In Perreault, W.D., & MaCarthy, Jr. E. J. (Eds). *Place and Development of Channel Systems*. Boston, Mass.: McGraw-Hill/Irwin.
9. Christina Dube, *5 Order Picking Technologies: Creating the Perfect Warehouse Fulfillment System*.  
<https://us.blog.kardex-remstar.com/order-picking-system-technologies>

10. Martin Murray. (Dec 5, 2018). Small Business Supply Chain Vendor Managed Inventory. <https://www.thebalancesmb.com/vendor-managed-inventory-vmi-2221270>
11. John Fernie & Leigh Sparks, Logistics and Retail Management: Emerging issues and new challenges in the retail supply chain (4th Edition)
12. Morash, Edward A, Dröge, Cornelia L M, Vickery, Shawnee K. (1996). Strategic logistics capabilities for competitive advantage and firm success. *Journal of Business Logistics*
13. Morash, E.A. (2001). Supply Chain Strategies, Capabilities, and Performance. *Transportation Journal*,
14. Tracey, M., Lim, J.S. & Vonderembse, M.A. (2005). The impact of supply-chain management capabilities on business performance. *Supply Chain Management*
15. Yadin,D. (2002).The international dictionary of marketing: over 2000 professional terms and techniques. London: Kogan Page
16. Yin, R.K. (1994). Case study research: design and methods (2nd ed.). Thousand Oaks, Calif: Sage
17. Silverman, D. (2007).A very short, fairly interesting and reasonably cheap book about qualitative research. London: SAGE