Developing the Strategies of Redesigning the Role of Retail Stores Using Cluster Analysis: The Case of Mongolian Retail Company

클러스터링을 통한 유통매장의 역할 재설계 전략 수립: 몽골유통사를 대상으로

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요 약

The traditional retail industry significantly changed over the past decade due to the mobile and online technologies. This change has been accompanied by a shift in consumer behavior regarding purchasing patterns. Despite the rise of online shopping, there are still specific categories of products, such as "Processed food" in Mongolia, for which traditional shopping remains the preferred purchase method. To prepare for the inevitable future of retail businesses, firms need to closely analyze the performance of their offline stores to plan their further actions in a new multi-channel environment. Retailers must integrate diverse channels into their operations to stay relevant and adjust to the shifting market. In this research, we have analyzed the performance data such as sales, profit, and amount of sales of offline stores by using clustering approach. From the clustering, we have found the several distinct insights by comparing the circumstances and performance of retail stores. For the certain retail stores, we have proposed three different strategies: a fulfillment hub store between online and offline channels, an experience store to elongate customers' time on the premises, and a merge between two non-related channels that could complement each other to increase traffic based on the store characteristics. With the proposed strategies, it may enhance the user experience and profit at the same time.

■ Keyword : Ratail Strategy, Integration, Multichannel, Omnichannel, Clustering

Abstract

전통적인 오프라인 중심의 상거래 방식은 온라인과 모바일 기술의 발전으로 인해 크게 변화하고 있으며, 이러한 변화는 구매 패턴에 관한 소비자 행동의 변화를 동반했다. 온라인 쇼핑의 성장에도 불구하고 몽골에는 여전히 '가공식품과 같은 특정 제품군에서는 전통적인 오프라인 매장을 더욱 선호하고 있다. 이러한 온라인과 오프라인 채널의 공존과 기능 변화에 대응하기 위해서는 기존 채널에 대한 성과를 면밀히 분석해야 한다. 특히, 채널의 역할 전환 혹은 통합과 같은 새로운 전략을 수립할 필요가 있다. 이에 본 연구에서는 몽골 유통 시장을 중심으로 오프라인 매장에 대한 매출, 이익, 판매량과 같은 성과 지표를 기준으로 군집분석을 실시하였으며, 각 군집의 특징을 주변환경과 비교하여 주요 특징을 발견하였다. 주요 군집에 속한 오프라인 매장의 성과 향상을 위해 온-오프라인 채널 간의 풀필먼트 허브 매장, 고객의 매장 체류 시간을 늘리기

위한 체험 매장, 그리고 매장 특성에 따라 서로 보완하여 트래픽을 증가시킬 수 있는 비관련 채널 간의 합병 등 세 가지 전략을 제안하였다. 이를 통해, 기존 유통 채널의 다변화와 함께 고객 경험 향상 및 수익성 개선을 달성할 수 있을 것이다.

■ 중심어 : 유통전략, 통합, 다중채널, 옴니채널, 클러스터링

Ⅰ. Introduction

The retail industry has witnessed a significant transformation in recent years, driven by rapid technological advancement and changing consumer preferences from a single-channel approach to a multi-channel approach. The traditional offline store no longer works as an only point of sale but expanded to encompass various channels, such as e-commerce websites, mobile applications, social media platforms, and more. The multi-channel concept recognizes the diverse ways consumers interact with businesses and provides them with seamless and integrated experiences across different touchpoints.

The multi-channel approach represents a strategic shift in the retail industry. Acknowledging the growing importance of meeting customers' needs and preferences through various channels has become the inevitable next step in Mongolia. By adopting a multi-channel strategy, retailers can effectively reach their target audience, who seek flexibility, convenience, and personalized interactions to enhance customer engagement and drive sales growth.

In a multi-channel retail environment, customers start their journey by researching products online, reading reviews, and comparing prices. Subsequently, they may visit an offline store to examine the product firsthand or seek assistance from knowledgeable staff. Alternatively, they might opt for the convenience of purchasing a mobile app or even engage with the brand through social media platforms for product recommendations and exclusive promotions.

The multi-channel concept allows retailers to leverage each channel's unique strengths, whether it is the convenience of online shopping, the sensory experience of an offline store, or the interactive engagement on social media platforms. Moreover, a well-executed multi-channel strategy enables retailers to gather valuable insights into customer behavior, preferences, and trends, empowering them to refine their marketing efforts and tailor their offerings accordingly.

However, implementing a successful multi-channel approach comes with its challenges. Retailers must ensure consistency in branding, messaging, and customer experience across all channels to maintain a unified and cohesive identity. In addition, they need to invest in technology infrastructure, seamless inventory management systems, and practical logistics to support a smooth flow of products across various channels. In conclusion, the multi-channel concept has become a cornerstone of the retail industry, reshaping how businesses interact with customers and deliver products and services. This study aims to define the key attributes of offline stores in Mongolia and analyze the relationship between

clustered locations and product categories to assess their influence on income and profitability by assessing the "AS IS" status of offline stores and proposing a new "TO BE" integrated store model by identifying the necessary changes that traditional offline stores should undergo when transitioning to integrated stores in the Mongolian retail market. The goal is to support these stores in staying competitive amidst the constantly changing retail industry.

The remain of this research structured as follows: Chapter 2 explains the integration strategy between offline & online channels and various integration approaches from existing literature reviews. Chapter 3 highlights the importance of retail location and store characteristics of available areas in Mongolia and introduces the Mongolian retail industry and its challenges to the readers. Chapter 4 presents the methodology and data introduction of the thesis. The explanation includes the functioning of the selected algorithm in theory and the tools for processing quantitative data. Chapter 5 consists of the main result of the data process and presents the findings. Finally, based on the data chapter suggests an integration strategy for Mongolian retailers. Chapter 6 focused on the conclusion of the thesis and future research suggestions for academic researchers interested in retail strategy and integration between channels.

Ⅱ. Literature Review

2.1 Channel Integration

Channel integration is defined as to the level at which different channels of one company interact (Bendoly et al., 2005).
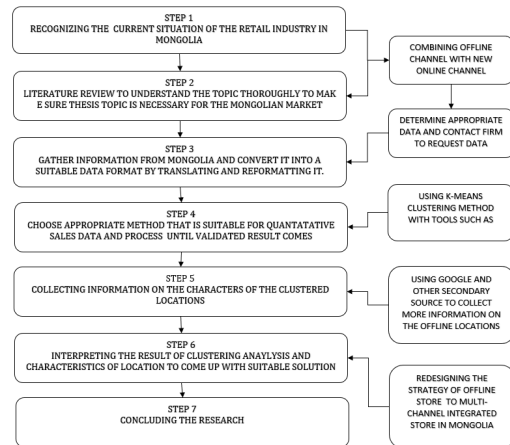
〈Figure 1〉 Framework of research

As per a survey by IBM in 2011, consumers prioritize a seamless experience across different channels rather than exclusive features in a specific channel (Lanlan Cao & Li Li, 2014). Customers increasing use of added channels has become an integral part of their shopping experience (Dholakia et al., 2010; Beck & Rygl, 2015); thus, the role of physical stores requires a change. The integration of different channels is becoming increasingly important, with a focus on mobile technologies and social media (Santiago Iglesias-Pradas & Emiliano Acquila-Natale, 2023).

When a physical store is equipped with new technologies and accessible through consumers' smartphones, it can be a hub that links different channels and creates value for the retailer (Ono et al., 2012). Integrating different channels creates new sales opportunities that would not have existed if the channels were kept separate. Furthermore, the results indicate that the integrated store attracted customers who would otherwise have purchased from non-integrated, third-party. This suggests that channel integration can be an effective way for firms to increase their sales and

expand their customer base. These findings could help retail companies start their integration strategies because the encouraging result shows a 20 (e.g., Verhoef, Neslin, & Vroomen, 2007) to 28 percent increase when both channels work simultaneously (Herhausen, Binder, Schoegel, & Herrmann, 2015).

Neslin et al. (2006) suggested an "availability effect" that adding more channels increases distribution, which lowers the search costs of customers and increases sales (Bhatnagar & Ratchford, 2004).

A common form of gathering information from the Internet but buying from the store is called "research shopping" (Verhoef, Neslin, & Vroomen, 2007). Of consumers who use their mobile devices in-store for research shopping purposes, 71% regard the mobile device as an essential component of their experience (Krueger, 2015). Furthermore, customers expect a consistent and cohesive experience throughout all stages of the purchase process and across all channels (Nunes & Cespedes, 2003; Van Bruggen et al., 2010). Therefore, in today's digitalized competitive environment, whether to implement online channels is no longer the focus, but how to implement a channel strategy matching market and consumer needs is crucial for businesses (Lewis et al., 2014; Payne & Frow, 2004; Verhoef et al., 2015; Zhang et al., 2010).

There are two common approaches to channel integration. The first approach is providing access and knowledge about the Internet store at physical stores, which could be achieved by providing Internet access to their online store from physical store locations. The second approach, providing access to and knowledge about physical stores at the Internet store, makes it easy for customers to find information about physical store locations and inventory online (Bendoly et al., 2005).

The first level of channel integration is a single-channel approach (the traditional store), the second level is a multi-channel approach (the conventional offline retail and online market), the third level is a cross-channel approach (where more types of channels are used, and some are integrated). A final level is an omnichannel approach (where many varied types of channels are used, and they are fully integrated – e.g., store, website, mobile channel, social media, and all customer touchpoints) (Frazer & Stiehler, 2014).

By providing customers with a seamless experience across channels, retailers can encourage customers to purchase from their stores regardless of the channel they use to evaluate products (Zimmerman, 2012). In addition, increased foot traffic can further strengthen brand awareness and increase the chances of cross-selling opportunities (Cao & Li, 2014), which can benefit retailers by allowing them to capture sales they may have missed if consumers were locked into a specific channel (Verhoef, Neslin, & Vroomen, 2007).

2.2 Multi-channel integration

Researchers refer to strategy concepts based on multiple channels using various terms, including 'channel integration,' 'cross-channel management,' 'multi-channel management,' and 'omnichannel management' (Mirsch et al., 2016).

The retail industry is changing as consumers increasingly demand a seamless experience across different channels. As a result, retailers are integrating multiple channels to meet this expect-

ation (Cao & Li, 2014) and offer their customers more options, potentially increasing sales for the company (Iglesias-Pradas & Acquila-Natale, 2023).

Multi-channel management refers primarily to a company's ability to effectively manage and integrate multiple channels through which customers can interact with the company. For example, a retailer with an online and an offline store offers to order a product online, but the online product is not returnable to the store. Therefore, multi-channel management focuses on each channel (Beck & Rygl, 2015; Verhoef et al., 2015).

If an integrated multi-channel system becomes the norm, consumers will likely expect fewer unique features in any one channel and instead seek more consistent experiences across all channels (Cao & Li, 2014). Furthermore, through multi-channel integration, retailers can use their websites and physical stores to increase mutual awareness (Steinfield et al., 1999; Vijayasarathy & Jones, 2000) customer satisfaction and improve retailer royalty and has been acknowledged as a strategic priority for retailers (Bendoly et al., 2005).

In addition, multi-channel management involves investments at the marketing level to coordinate brand image across channels and merchandise and integrate logistics processes and customer databases at the operations and information management level (Pentina & Hasty, 2009).

2.3 Cross-channel integration

The cross-channel strategy involves integrating multiple channels in a coordinated manner to provide a seamless and consistent customer experience across all channels but partially integrate them and focus on creating a semi-holistic approach to channel management (Beck & Rygl, 2015). Customers can change channels in a restricted manner but only between some available channels. For example, the customer can return an online purchased product to a physical store but redeemed a voucher can be used only in online stores (Mirsch, Lehrer, & Jung, 2017).

Integration can help reduce the channel-specific lock-in effects that prevent consumers from purchasing in a particular channel. (Verhoef, Neslin & Vroomen, 2007). The process could be particularly beneficial for firms with less online experience. It effectively allows traditional, store-based retailers to "catch up" in their sales growth. By leveraging their physical stores, retailers can integrate their channels and provide a seamless shopping experience across all channels, ultimately resulting in sales growth. Cross-channel integration impacts a company's sales growth in five ways: boosting trust, enhancing customer loyalty, increasing consumer conversion rates, creating more opportunities for cross-selling, and avoiding the loss of unique channel features (Cao & Li, 2014).

2.4 Omni-channel integration

Aubrey and Judge's article in 2012 was the first instance in academic literature where the term "omnichannel" was used (Frazer & Stiehler, 2014). The omnichannel approach helps integrate the online and offline channels and provides a seamless shopping experience (Neslin et al., 2006) and interchangeability across different formats (Rossi, 2021) for the consumer.

The omnichannel approach creates new data

sources, mainly social and mobile sources, and various data types that could be used to increase the firm's profit. However, first and foremost, consumer data from all channels have to be analyzed consistently (Trenz, 2015), which requires an extensive financial investment (Frazer & Stiehler, 2014).

It takes a customer-centric approach and leverages data and technology to provide personalized experiences across all touchpoints. Barriers between all channels and touchpoints vanish when the firm reaches omnichannel, and customers can move freely within all channels and create a brand experience (Piotrowicz & Cuthbertson, 2014; Verhoef et al., 2015).

Many organizations develop Web and mobile platforms as built-in features to existing channels. This development may result in different product ranges, offers, and price levels across the various channels (Cook, 2014) which is frustrating for omnichannel customers cause dealing with inconsistencies between other channels should be eliminated while creating omnichannel (Chatterjee & Kumar, 2017), as these can influence the overall image of the company (Oh et al., 2012). In addition, half of the total U.S. retail sales in 2016 were through digital touchpoints resulting in enhanced customer experiences (Wright, 2017). Therefore, omnichannel retail supply chains should be designed to have one integrated inventory and customer information database across all channels (Adivar, Hüseyinoğlu & Christopher, 2019).

2.5 Integration strategy

Retail businesses have focused on implementing new technologies and strategies, such as con-

tactless payments and virtual shopping experiences, to cater to consumers' evolving needs and preferences (Rossi, 2021). In addition, new retail trends, including a store within a store, private labels, self-checkout, omnichannel business format, retail subscription models, and consumer financing, are changing the face of retail. Considering these critical changes, retailers are unlocking strong value-creating possibilities for all stakeholders (Kumar & Venkatesan, 2021).

Retailers can direct consumers from their website to the physical store by encouraging them to browse product availability in their local stores (Cao & Li, 2014). Once consumers are inside the physical store, they tend to have lower service demands and may be more open to cross-selling opportunities (Neslin et al., 2006). However, retailers also recognize the need for personalization, customer data privacy, as well as the importance of supply chain redesign to support their omnichannel operations (Iglesias-Pradas & Acquila-Natale, 2023).

When online shoppers gain more experience, they switch between different shops and become less loyal. Therefore, most retailers have employed asymmetrical integration where the online channel carries additional assortment items, termed "the long tail." This assortment gives customers more options, potentially leading to higher sales for the retailer (Emrich, Paul, & Rudolph, 2015).

Consumers' intentions to use three omnichannel shopping methods: buy online pick-up in-store (BOPIS), buy online curbside pick-up (BOCP), and buy in-store home delivery (BIHD) (Chen & Chi, 2021). Implementing BOPIS is one solution for online retailers to integrate better physical stores and digital channels (Iglesias-Pradas &

Acquila-Natale, 2023) also can provide convenience to consumers (Lanlan Cao & Li Li, 2014). Suppose a retailer effectively integrates its channels by offering enhanced services like BOPIS. Customer satisfaction is anticipated to improve, resulting in customer loyalty. When loyal to a retailer, consumers are likely to return, make repeat purchases (Zeithaml et al., 1996), and recommend the products to their friends or family (Frasquet & Miquel, 2017).

In addition, traditional retailers have implemented several strategies to stay competitive, such as improving their e-commerce capabilities, creating engaging in-store experiences, easy return and exchange processes, and providing personalized customer service (Yokoyama, Azuma & Kim, 2022). Jupiter Media Metrix conducted research in 2001 and found that 83% of online buyers in the U.S. preferred to return their online purchases to physical stores, and 59% expressed a desire to order products online but pick them up from brick-and-mortar stores (Goersch, 2002). Offline stores offer an opportunity for customers to interact with products, receive in-person assistance, and take advantage of convenient services like buy-online pick-up in-store. These offline stores can also serve as distribution centers, enabling retailers to offer customers faster and more efficient delivery options. By leveraging their offline stores and implementing cross-channel integration, traditional retailers can compete with and even outperform online-only retailers regarding sales growth and customer satisfaction (Neslin & Shankar, 2009). In addition, returns and exchanges are significant for retailers (Enright, 2003). Returns data can provide valuable insights into customer behavior, preferences, and sat-

isfaction levels, as well as the quality and popularity of products. As a result, retailers can use data to improve their product offerings, pricing, and marketing strategies. Some firms offer different pricing within their channels. However, previous studies have discovered that numerous omnichannel retailers opt for a uniform pricing strategy to avoid cannibalizing sales and reducing customer confusion. Omni-channel coordinates all aspects of product assortment, including product availability, pricing, and promotion, across all channels to provide consumers with a seamless and consistent experience across all touchpoints. This approach ensures that consumers can access the same products, prices, and promotions regardless of their purchase channel. In addition, it helps avoid confusion and frustration consumers may experience when they find different products or prices across various channels, leading to better customer satisfaction and loyalty (Rooderkerk & Kök, 2017).

3. Research Background

3.1 Current status of the Mongolian retail market

Mongolia is a landlocked country with no access to the coastline and has a relatively small economy, ranked 128th (GDP, populationu.com, 2022) globally and the least densely populated country in the world. The country has a small population, 3.4 m (Worldometers.info, 2021), and much of it is relatively poor, especially compared to its southern neighbor, China. Nevertheless, Mongolia still needs to have the scale or the critical mass to justify investment in large manufacturing facilities, which

eventually must deal with the country's geographical isolation and relative lack of transportation. Due to the lack of manufacturers, our retail market relies heavily on imported products for most categories. According to the results of the last nine years of Mongolian import data, our import amount is gradually increasing. Mongolia has imported from 142 different countries. Major countries account for 83.6% of total imports. The main import currency is USD; compared to the pre-pandemic era, the exchange rate has increased by 16.3% within less than a year.

Generating revenue in the retail market is challenging due to the high level of competition in our population. Mongolia has multiple retail companies that operate a variety of store types. Nomin Holding (57 stores), Minii Delguur (16 stores), Orgil (4 stores), Emart (3 stores), GS25 (91 convenience stores), CU (300 convenience stores), and Traditional Market (5 markets).

In Mongolia, over 4,000 points of sale (POS) are available, with sizes ranging from 12 square feet to 4,000 square feet. Retail stores are divided into department stores, supermarkets, convenience stores, and traditional markets. Department stores in Mongolia have a similar concept as any other country, typically designed with a layout that features multiple floors or levels, each housing a different category or department of products. The store's design is usually organized to maximize customer flow and make it easy for shoppers to find what they want. In addition, the merchandise is often arranged in visually appealing displays, and there may be signage or maps throughout the store to guide customers to different sections. Department stores may also have amenities such as food courts, rest areas, and fitting rooms to enhance the customer experience.

Based on the capacity of each location, supermarkets can be named differently, such as hypermarkets, wholesale centers, and convenience stores, depending on the culture and customer preferences. The standard format of a supermarket typically refers to the layout and design of the store, including the arrangement of products, aisles, and displays. Their product SKU levels differ from format to format based on the available space. As the name suggests, the wholesale center has to offer special prices for bulk buying.

In contrast to the past, when convenience stores were owned and operated by individuals, today, many Korean companies (CU, GS25, Ministop) have entered the market and established them as branded convenience stores operating under a franchise business model.

For a long time, the Mongolian retail market has concentrated solely on the offline sector. However, the introduction of new digital channels has started to shift customer behavior in a different direction with the rise of online channels. In addition, urbanization and usage of smartphones are becoming more accessible than brick-and-mortar retail; thus, integrating offline and online stores becomes the next step in the retail industry.

Foreign online retailer companies have yet to enter the Mongolian online shopping market except for Alibaba, which started during the pandemic, so it is early to make any assumptions about their progress in Mongolia. In addition, mainstream brands with online shopping sites do not offer official delivery services to Mongolia. As a result, customers in Mongolia must purchase from the brand's international sites and rely on local delivery companies and airlines to transport their purchases, which

can be time-consuming. Furthermore, due to this extended process, products with expiration dates are only available for purchase locally.

3.2 Challenges of the Mongolian retail market

The exchange rate of USD and transportation cost increase accounted for 25.6% inflation growth in Mongolia in Aug 2022. Recent transportation cost growth is one of the primary reasons behind the inflation of FMCG. Our landlocked position puts us in a difficult situation to negotiate for faster and cheaper global shipping. It turns out that 80% of products sold in supermarkets are imported from foreign countries. The price of domestically manufactured products (MADE IN MONGOLIA) also increases in the same way as imported products because the raw materials used for production are imported from different countries.

Our country needs a faster and new rail transportation system, but investment from the government for this project would be huge, so it has been on hold for many years, and we are likely to wait much longer.

Due to the consistently low temperatures in our country, transportation options are limited to cars, trains, and buses. Motorcycles, bicycles, scooters, and metros are not commonly used for store visits. Therefore, owning a car is essential for every household. When traveling by car, shopping for heavy loads from supermarkets is feasible. However, traffic congestion remains a significant issue in our city, and a lasting solution has yet to be found. So far, there are some regulations from the government to decrease the number of cars on the road based on the car plate number, which is if a person's car plate ends with one and

six, that car is forbidden to travel on Monday. This decreases traffic by 20% each day but is not well received by the public. This is just highlighting how severe our traffic congestion is at the moment. For example, the capital city Ulaanbaatar's traffic congestion is so alarming that it is hard to deliver in the town during the day. As a result, online shops usually provide shipping service at night, around 8 pm to 11 pm. Traffic congestion affects people's shopping behavior, and customers prefer to visit the supermarket closer to their homes or workplace, so our research will focus on the location characteristics of offline stores.

Traditional offline stores need a new strategy in Mongolia to compete with increasing online shoppers. According to a survey conducted by MMCG, there are 3.2 million active internet users, with 88% of them using the platform daily. Additionally, the survey found that 95% of all internet purchases are made within Ulaanbaatar. The main issue is a limited cargo service between rural provinces and the capital city. As a result, the shipping process heavily relies on trust between the seller and purchaser. Currently, no delivery company officially provides last-mile delivery services between provinces. Therefore, delivery systems, payment transactions, and lack of trust between seller and purchaser are problematic online market areas.

It is worth noting that obtaining real-time sales data can be a challenge since privately owned stores in Mongolia typically lack an operating system to track quantitative measures. As a result, this task is usually performed manually. Nevertheless, larger companies with multiple POS locations have switched to electronic systems, though such data is kept strictly confidential.

3.3 Retail location

Consumer behavior, preferences, demographics, and attitudes heavily influence sales performance at a particular retail location (Satpathy, 2015). The store's location is crucial for retailers offering various products and brands to serve the needs of different consumer groups. This is because they need to cater to the specific needs of different consumer groups and offer a diverse range of products and categories (Ganesha, Aithal, & Kirubadevi, 2020)

Retail businesses heavily rely on having a significant customer base to generate sales revenue, which means factors such as an increase in residential and floating populations, as well as property developments in the area and improvements to public transportation, are seen as potential factors that can help expand the customer base (Schuetz, 2015; Teller & Reutterer, 2008; Kivell & Shaw, 1980).

The accessibility of a retail location is a crucial factor that can significantly impact the success or failure of a retail business. Customers need to be able to access the store quickly, and the store should be visible and conveniently located to attract potential customers. In addition, the availability of parking spaces (Cahyani et al., 2021; Konuk, 2021; Cuthbertson & Laine, 2003) and public transportation options significantly affect accessibility. Therefore, retailers need to consider these factors when selecting a location for their store to ensure that they can attract and retain customers (Litz & Rajaguru, 2008).

Because of urban traffic congestion, more people tend to choose public transport as a vehicle for shopping. The more away from the city center, the higher number of customers who choose to travel themselves (Li, Li, Yin, Hu, Ye & Wang, 2020).

The area's population and demographic characteristics (Beatty et al., 1996). can help determine the potential customer base. At the same time, traffic and accessibility can affect the ease customers can reach the store. Zoning laws and neighboring businesses can also impact the success of a retail location, as can the cost of operating in a particular area. Existing sales performance data and geographical attributes, such as the presence of natural or manufactured landmarks, can also play a role in the decision-making process. Finally, public transit durations and distances can affect the ability of customers and employees to access the location, which can, in turn, impact the business's success (Borowski et al., 2008; Kim et al., 2016).

3.3.1 Descriptions of offline stores

- Capacity of the store - Directly influences the SKU level of the store, determines how much inventory the store can hold, affects the layout and organization of the store
- Residential area - Shows how many percent of stores surrounding are covered by apartments.
- Ger zone - Shows how many percent of stores surrounding is covered by Gers.
- Industrial area - Shows how many percent of stores surrounding is covered by industrialized areas.
- Type of location - People visit different locations for specific purposes, which could influence stores' performance.
- Number of schools and kindergartens - Within 1 km of the store radius, how many schools and kindergartens are present.
- Parking lot - The availability of parking

spaces (Cahyani et al., 2021; Konuk, 2021; Cuthbertson & Laine, 2003) is one of the focused characteristics of the store.

⟨Table 1⟩ Characteristics of offline stores

ID	Name	District	Capacity	Residential area	Ger zone	Industrial	Area — Type of location	School/Kindergarten	Parking space
1	Online	All					Covering all area		
2	Sukhbaatar HM	Sukhbaatar	MID	7%	93%	0%	GER ZONE	LOW	LOW
3	Bayanzurkh Market	Bayanzurkh	HIGH	44%	56%	0%	GER ZONE	LOW	MID
4	Khan-Uul SM	Khan-Uul	LOW	36%	0%	0%	HIGH - END RESIDENTIAL AREA	LOW	MID
5	Songinokhairkhan HM	Songinokhairkhan	LOW	0%	7%	93%	INDUSTRIAL AREA	LOW	HIGH
6	Songinokhairkhan Market	Songinokhairkhan	MID	0%	28%	72%	INDUSTRIAL AREA	NO	HIGH
7	Khan-Uul Market	Khan-Uul	HIGH	91%	0%	9%	OFFICE DISTRICT	HIGH	HIGH
8	Khan-Uul DS	Khan-Uul	MID	57%	0%	43%	OFFICE DISTRICT	LOW	HIGH
9	Tumur-zam SM	Bayangol	LOW	87%	13%	0%	RESIDENTIAL	HIGH	HIGH
10	Bayangol SM	Bayangol	LOW	72%	0%	28%	RESIDENTIAL	HIGH	LOW
11	Bayangol HM	Bayangol	MID	49%	26%	25%	RESIDENTIAL	HIGH	MID
12	Amgalan HM	Bayanzurkh	MID	64%	36%	0%	RESIDENTIAL	LOW	LOW
13	Darkhan Market	Darkhan-Uul	LOW	85%	15%	0%	RURAL	LOW	HIGH
14	Erdenet Market	Bayan-undur sum	HIGH	0%	6%	23%	RURAL	NO	MID
15	Dornod Market	Dornod	HIGH	17%	83%	0%	RURAL	LOW	MID
16	Bayangol DS	Bayangol	MID	80%	20%	0%	SHOPPING	HIGH	HIGH
17	Chingeltei DS	Chingeltei	HIGH	94%	6%	0%	SHOPPING	HIGH	HIGH
18	Urgoo SM	Bayangol	MID	94%	6%	0%	SHOPPING	HIGH	HIGH
19	Bayangol SM	Bayangol	LOW	65%	35%	0%	SHOPPING	HIGH	LOW
20	Bayanzurkh HM	Bayanzurkh	HIGH	97%	3%	0%	TRADITIONAL MARKET	LOW	LOW

Level	Capacity	School/Kindergarden	Parking
LOW	657-1985	1-6	10-30
MID	2015-2837		40-80
HIGH	3093-4402	8-17	100-200

4. Methodology

4.1 Data mining

Data mining, in simple terms, is finding useful patterns in a large amount of data (Christianto, Fendyanto, Bernanda, Andry, & Lee, 2022). Data mining is a system of processes for extracting additional value from data and information that cannot be calculated manually (Madison, Defit, & Alturky, 2021).

The term "mining" refers to the process of extracting a few valuable insights from many simple materials. The process of applying this approach to data to discover hidden patterns is known as data mining. For translating data into information, data mining is becoming increasingly relevant (Madison, Defit, & Alturky, 2021).

Standard data mining analysis methods include statistical analysis, clustering, classification analysis, association rules, or frequent set mining (Jiang, Zhang, Peng, Sun, Cao, & Li, 2020). In addition, there are various ways to process data, including manual methods, computational meth-

ods (Christianto, Fendyanto, Bernanda, Andry, & Lee, 2022), digital tools, and computerized software (Supriyati & Abdillah, 2020).

4.2 Clustering

Clustering is grouping several data or objects into clusters (groups) so that each cluster will contain data as similar as possible and different from objects in other clusters. The clustering process is unsupervised, meaning the algorithm lacks labeled data or pre-defined classes. Therefore, it is up to the algorithm to group the data into clusters based on the similarity of the instances without any external guidance (Christianto, Fendyanto, Bernanda, Andry, & Lee, 2022).

Other machine learning types, such as classification and regression, are supervised because they use labeled data to learn how to make predictions or classify instances.

4.3 K-means clustering

The K-Means algorithm is a cluster analysis algorithm used as a partitioning method developed by MacQueen in 1976. The k-Means algorithm will determine a collection of k clusters and assign each instance to the most suitable cluster (Christianto, Fendyanto, Bernanda, Andry, & Lee, 2022).

K-means is a commonly used clustering algorithm that can be integrated into suboptimal partitions. It uses a stochastic optimization approach to avoid convergence for locally optimal solutions. In K-means, the centroid table is a benchmark for dividing data points into groups. The algorithm assigns each data point to the clos-

est centroid (Supriyati & Abdillah, 2020). K-Means is a widely used algorithm because it is easy to implement. The algorithm is distance-based and divides data into several clusters. (Setiawan & Rino, 2022)

About the K-means method based on the study's findings and the following discussion, it can be concluded that data clustering will yield good results if the k value (number of clusters) is chosen in the appropriate amount (Madison, Defit & Alturky, 2021).

The algorithm involves the following steps:

1. Randomly select k objects as initial centroids.
2. Assign each object to the closest centroid.
3. Recalculate the centroid of each cluster based on the assigned objects.
4. Repeat steps 2 and 3 until convergence.

The similarity of objects in a cluster is determined by their proximity to the cluster's centroid.

The recommended process is as follows:

- Data Preparation

Data preparation is collecting data for problem-solving (Mardison, Defit & Alturky, 2021). Our approach involved selecting a national retailer and gathering empirical data on their actual quantitative measures. The data mining tool utilized the following raw data to extract outcomes.

- Number of stores: 20 (including one online store and 19 offline stores)
- Year: 2013 - 2021 (9 years)
- Category - Specific section of products that is similar or related to each other. There are 13 different categories in the context.
- Sub-category - Derived from the category, which there are 78 sub–categories in the file.

- Class - Derived from the sub-category, which there are 238 different classifications in the file.
- SKU - It is a unique identifier assigned to each particular product in our data; there are more than 30,000+ SKUs available
- Sales volume - how many pieces are sold within that year.
- Revenue - how much was the revenue within that year (MNT)
- Profit - how much was the profit of a specific category, sub-category, and classification (MNT)
- Average selling price - Average retail price of each department based on their qty and amount

- Data preprocessing

〈Table 2〉 Example of Raw data

Year	Category	Sub-Category	Classification	Qty	Salesamount	Profit amount
2013	Electronics	Air Quality & Water heating	Air Quality	7	4,134,482	212,500
2013	Electronics	AV	Television	15	7,081,682	302,770
2013	Electronics	Small home Appliances	Small household appliances	3	345,427	55,959
2013	Electronics	Small home Appliances	Small Kitchen appliances	2	231,800	37,552
2014	Beverage	Juice	Mixed Juice	47	193,321	10,968
2014	Electronics	Air Quality & Water heating	Air Quality	52	10,161,517	551,208
2014	Electronics	AV	Home Theater & Players	5	1,636,318	63,630
2014	Electronics	AV	Television	16	10,436,218	699,265
2014	Electronics	AV	TV accessories	1	27,272	5,891
2014	Electronics	Big home Appliances	Built-in Appliances	1	56,132	(45,024)
2014	Electronics	Big home Appliances	Freestanding Cooker	1	734,082	72,636
2014	Electronics	Big home Appliances	Refrigerators & Freezers	1	436,355	62,835
2014	Electronics	Computing & Camera	Computers	13	13,081,700	685,898
2014	Electronics	Computing & Camera	Portable Audio	2	2,318,164	379,088
2014	Electronics	Small home Appliances	Health & Beauty appliances	1	63,635	14,118
2014	Electronics	Small home Appliances	Small Kitchen appliances	4	384,517	62,291
2014	Processed Food	Candy/Chocolate	Pill & Soft Candy	93	128,406	7,883
2014	Processed Food	Snacks	Biscuits	46	192,322	10,580
2014	Processed Food	Snacks	Chips&Popcorn	46	123,322	8,100
2014	Processed Food	Snacks	Confectionery	46	172,249	9,151
2014	Processed Food	Snacks	Gum&Mint	93	291,688	18,938
2014	Processed Food	Snacks	Processed Fruit, Nuts and Mix	46	215,740	11,338
2014	Sport, Outdoors and Travel	Travel & Outdoor	Camping & Outdoor	19	926,305	164,361
2015	Electronics	Air Quality & Water heating	Air Quality	4	1,831,782	187,840
2015	Electronics	Big home Appliances	Refrigerators & Freezers	1	409,082	58,908
2015	Electronics	Big home Appliances	Washing and Dryer machines	1	636,355	91,635
2015	Electronics	Small home Appliances	Small Kitchen appliances	3	427,245	76,832

The collected data was translated from Mongolian to English so our audience could comprehend it. Several data pruning processes went into the original data; Subcategory, Class, SKU, Sales volume, Profit, and Average retail price were deleted. In addition, data duplication is removed, checked for inconsistent noise, and errors in data, such as empty cells converted to numerical value 0, are corrected.

〈Table 3〉 Example of processed data

ID	Automotive Parts & Accessories	Beverages	Building Supplies & Tools	Books & Stationary	Consumer Electronics	Apparel and Accessories	Fresh Food	Health & Wellness	Housewares & Home Décor	Obsolete Products	Beauty & Personal Care	Packaged Foods	Sport & Travel	Toys & Hobbies
2012VAR1	215	1,236,534	6,927	104,740	788,749	88,910	136,581	5,495	740,537	99,815	839,047	3,574,447	66,815	85,323
2012VAR2	32	834,837	2,431	73,597	265,504	56,366	245,252	3,385	391,369	36,572	475,022	2,215,498	67,588	92,086
2014VAR1	3,279	1,079,893	3,378	190,533	603,866	120,971	173,219	9,058	597,422	77,329	868,146	3,362,009	81,472	85,389
2014VAR2	201	694,265	890	71,145	184,633	53,468	218,136	4,326	348,015	53,636	459,422	1,939,947	54,971	77,700
2014VAR4	2,499	510,359	648	26,388	84,637	29,566	9,171	585	98,439	17,190	135,341	1,003,573	69,871	20,965
2015VAR1	52	799,980	1,920	109,318	433,957	86,020	123,888	5,221	344,560	34,216	674,598	2,360,945	62,101	57,173
2015VAR2	22	531,621	1,219	69,477	116,615	33,758	150,782	3,123	223,900	24,658	333,137	1,451,830	46,128	66,167
2015VAR4	366	1,242,310	498	46,753	97,266	70,887	65,834	1,107	142,960	21,453	205,501	1,858,221	89,501	37,276
2016VAR1	141	777,207	1,688	142,091	561,771	80,912	126,075	6,425	468,162	23,505	600,862	2,254,080	55,803	47,435
2016VAR2	37	432,659	943	52,524	126,196	20,325	119,897	3,188	176,001	14,569	386,153	1,236,530	39,686	47,267
2016VAR4	68	1,459,217	1,400	52,984	93,470	82,226	61,960	1,493	140,654	16,234	199,074	2,247,263	194,612	40,548
2017VAR1	287	817,765	4,091	168,642	463,487	274,816	114,164	7,567	399,961	34,120	591,789	2,575,348	60,332	58,236
2017VAR2	1,622	417,616	1,920	61,451	128,096	31,873	84,923	5,670	170,981	18,580	279,966	1,292,753	32,294	52,891
2017VAR4	507	1,547,477	2,336	62,348	114,710	115,733	86,475	2,544	140,961	13,796	232,465	2,537,746	121,219	53,231
2018VAR1	1,398	901,126	3,881	235,804	478,305	142,658	154,980	8,455	452,232	24,580	638,236	1,039,069	62,120	74,380
2018VAR2	2,391	489,699	2,382	84,281	153,205	45,514	131,594	6,254	191,564	5,388	324,399	1,315,057	40,179	07,761
2018VAR3	599	163,821	907	28,612	28,211	12,232	52,008	1,787	42,526	2,222	107,009	507,538	7,623	15,592
2018VAR4	2,216	1,761,388	3,815	78,251	166,854	173,804	95,672	6,083	202,238	38,225	270,799	2,782,153	144,851	69,803
2019VAR1	686	978,962	4,815	283,851	385,650	138,257	212,522	10,512	388,406	31,750	707,013	3,237,302	54,622	80,667
2019VAR2	1,071	536,640	2,888	87,758	140,136	47,661	145,093	6,150	185,011	24,828	389,173	1,697,071	40,802	63,778
2019VAR3	1,090	436,926	1,853	56,199	36,413	30,867	180,464	3,536	95,182	45,416	302,560	1,419,685	19,388	60,402
2019VAR4	2,573	1,727,209	2,895	74,415	132,634	156,398	106,462	6,067	201,722	54,212	398,568	2,750,592	123,544	71,348
2020VAR1	841	1,061,002	6,885	317,458	496,131	323,241	279,136	35,192	408,610	1,489	920,091	3,541,023	80,577	90,732
2020VAR2	1,609	503,292	3,676	85,635	185,690	50,003	156,070	14,354	180,012	489	410,968	1,658,773	40,972	117,699
2020VAR3	1,833	520,604	2,731	59,991	43,116	47,538	234,208	11,398	117,875	9,412	396,167	1,886,533	28,405	117,582
2020VAR4	2,479	1,509,385	4,894	66,273	135,162	151,195	130,132	14,968	172,877	306	311,512	1,518,681	117,329	176,733
2021VAR1	1,129	1,881,792	10,667	804,107	652,814	393,574	356,162	75,645	490,847	(3)	1,008,412	4,487,516	119,922	471,164
2021VAR2	1,090	621,410	3,098	131,108	250,503	73,180	217,658	33,169	214,346	1	659,174	2,063,438	46,732	56,769
2021VAR3	2,000	739,582	2,702	78,897	58,063	66,828	398,538	32,134	145,821	0	444,010	2,248,145	42,098	147,862
2021VAR4	828	2,146,886	5,797	89,525	192,377	194,928	176,835	38,633	254,014	(25)	366,443	3,276,100	153,025	264,779

The main attribute selected to be analyzed in the data set is the revenue of each category.

After the data preparation process, the data will be processed in a particular format before it can be applied. Converts all nominal data to numerical. This has to be done because the K-Means algorithm can only process values that have ranges.

- Data Modeling

We have used Rapidminer for running the data mining procedure. RapidMiner is a popular open-source software for data mining and machine learning tasks. It provides a user-friendly interface and supports various data mining techniques, including text mining (Supriyati & S R Abdillah, 2020).

In this process, the search for useful patterns or information in the selected data is carried out using specific k-means clustering algorithmic techniques. Our prepared files are in Excel format.

〈Figure 2〉 Process of clustering in Rapidminer

Normalizing the data is an essential step in k-means clustering because it ensures that all features contribute equally to the clustering process.

This operator can also help reduce outliers' influence on the clustering process. Outliers, which are data points significantly different from the other data points, can distort the clustering results. Various methods to normalize the data include min-max scaling, z-score normalization, and unit normalization.

Our process used Min-max to rescale the data to a range between 0 and 1.

The algorithm used Mixed Euclidean distance to calculate the similarity between data points. The Euclidean Distance formula calculates the distance between each existing data set. Here is the formula for calculating the distance between two points:

$$d(x,y) = sqrt((x1 - y1)^2 + (x2 - y2)^2 + ... + (xn - yn)^2)$$

Where:

- $d(x,y)$ is the distance between points x and y
- $x1, x2, ..., xn$ are the coordinates of point x in n-dimensional space
- $y1, y2, ..., yn$ are the coordinates of point y in n-dimensional space
- sqrt is the square root function

In the last stage, we used the performance operator, which can perform statistical calculations on the performance of the clustering model that has been built. This operator will receive input from the K-Means clustering operator. In this research, we settled on the "Davies Bouldin Index." Davies-Bouldin index is a measure of the quality of clustering in k-means clustering. It is based on the average similarity between clusters and their centroids and the separation between the clusters. The lower the Davies-Bouldin index, the better
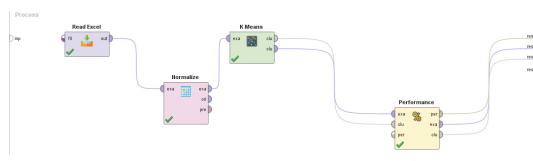
the clustering solution. The formula for the Davies-Bouldin index is as follows:

$$DB = (1/k) * \Sigma i=1 \text{ to } k \max j \neq i (Ri + Rj) / Dij$$

Where:

- k is the number of clusters
- Ri is the average distance between the data points in cluster i and the centroid of cluster i
- Rj is the average distance between the data points in cluster j and the centroid of cluster j
- Dij is the distance between the centroids of clusters i and j

The Davies-Bouldin index ranges from 0 to infinity. Therefore, by comparing the Davies-Bouldin index for different values of k, we can determine the optimal number of clusters that provide the best balance between cluster separation and cluster coherence.

4.3.1 Data Understanding

The process is translating patterns resulting from data mining that is displayed in a form easily understood by interested parties (Michael Setiawan & Rino, 2022). Therefore, we must also consider whether the cluster is understandable (Christianto, Fendyanto, Bernanda, Andry, & Lee, 2022).

Temporary value representing the cluster's center, also known as the centroid.

The final clustering result is considered done when the previous clustering results have the same pattern (Hardianto, Ramadhan, Pane & Yunefri, 2022). The data's final clustering occurred in the 572nd iteration before this attempt result differed from our final cluster.

〈Table 4〉 Centroid value of each category

Attribute	cluster_0	cluster_1	cluster_2	cluster_3	cluster_4	cluster_5	cluster_6
Automotive Parts & Accessories	0.153	0.301	0.483	0.077	0.422	0.245	0.057
Beverages	0.266	0.002	0.755	0.774	0.686	0.384	0.096
Building Supplies & Tools	0.144	0.352	0.349	0.126	0.699	0.324	0.087
Books & Stationary	0.210	0.357	0.175	0.285	0.817	0.332	0.096
Consumer Electronics	0.060	0.743	0.038	0.026	0.193	0.124	0.042
Apparel and Accessories	0.142	0.281	0.438	0.124	0.501	0.306	0.036
Fresh Food	0.213	0.057	0.163	0.866	0.424	0.267	0.119
Health & Wellness	0.074	0.114	0.122	0.238	0.402	0.154	0.023
Housewares & Home Décor	0.310	0.553	0.322	0.424	0.851	0.566	0.123
Obsolete Products	0.083	0.200	0.104	0.342	0.101	0.169	0.053
Beauty & Personal Care	0.290	0.007	0.201	0.901	0.659	0.424	0.140
Packaged Foods	0.239	0.000	0.371	0.839	0.602	0.349	0.101
Sport & Travel	0.128	0.182	0.799	0.110	0.520	0.286	0.052
Toys & Hobbies	0.086	0.128	0.259	0.056	0.269	0.156	0.032

The elbow method is a technique used in data analysis and machine learning to determine the optimal number of clusters in a dataset. In the Elbow method, we vary the number of clusters (K) from 1 – 40. For each value of K, we are calculating WCSS (Within-Cluster Sum of Square). WCSS is the sum of the squared distance between each point and the centroid in a cluster. The lower the WCSS value, the better the clustering solution.

The formula for calculating the WCSS is as follows:

$$WCSS = \Sigma(dist(x, c)^2)$$

Where:

- WCSS represents the within-cluster sum of squares.
- Σ denotes the summation symbol, indicating that the formula is applied to all data points.
- dist(x, c) represents the distance between a data point x and its assigned cluster centroid c. The distance measure can vary based on the clustering algorithm, but commonly used distance metrics include Euclidean distance, Manhattan distance, or Mahalanobis distance.
- ^2 indicates squaring the distance value.
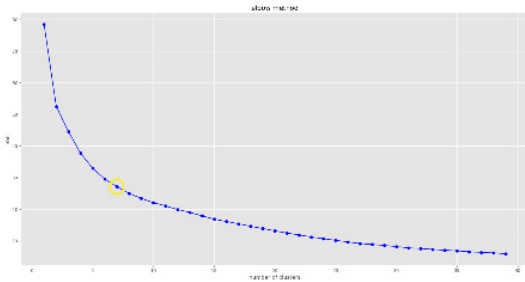
〈Figure 3〉 Elbow method result

When we plot the WCSS with the K value, the plot looks like an Elbow. This is because as the number of clusters increases, the WCSS value will decrease.

The point at which the elbow shape is created is 7. K = 7.

- Validation

We validated our result with Phyton to ensure k=7 is the same across other computational tools.

Ⅴ. Findings

5.1 Interpretation of result

Four primary themes of interpretation can be identified when analyzing sales data processed by the k-means clustering method.

a) Cluster-to-cluster comparison.

Based on the result of the k-means algorithm, we clustered retail stores' quantitative data to see which clusters have more success and which are declining based on selected factors.

〈Table 5〉 Clustered locations characteristics

Cluster	Retail price	Profit	Qty	Revenue	Capacity				Type of location						School/Kindergarten			Parking			
					HIGH	LOW	MID	NO	GER	INDUSTRIAL	OFFICE	RESIDENCE	RURAL	SHOPPING	HIGH	LOW	NO	HIGH	LOW	MID	NO
Cluster 0: 63 items	21,106	34.09%	36.09%	32.84%	9.30%	11.05%	16.28%		4.65%	2.33%	1.74%	11.63%	8.14%		8.14%	12.79%	21.51%	2.33%	12.21%	14.53%	9.88%
Cluster 1: 6 items	67,721	2.30%	0.31%	3.10%			3.49%								3.49%	3.49%					3.49%
Cluster 2: 5 items	23,546	4.49%	4.19%	4.14%			2.91%		2.91%								2.91%	2.91%			
Cluster 3: 9 items	9,356	14.62%	14.18%	14.08%	5.23%										5.23%	5.23%	5.23%				
Cluster 4: 8 items	35,168	9.65%	9.12%	10.89%	4.07%	0.58%			1.16%			2.33%		1.16%		2.33%	2.33%	2.91%			1.74%
Cluster 5: 29 items	28,911	22.93%	22.66%	23.21%	11.05%	2.33%	3.49%		3.49%	0.58%	2.91%	3.49%	4.07%		2.33%	3.23%	9.30%	2.33%	4.65%	4.07%	8.14%
Cluster 6: 52 items	48,116	12.48%	14.05%	11.75%	1.16%	14.53%	9.30%	5.23%	1.16%	1.16%	2.91%	16.28%	1.74%	1.74%	12.79%	10.47%	6.98%	6.40%	12.79%	5.81%	5.23%
Total	32,627	100.00%	100.00%	100.00%	30.81%	28.49%	35.47%	5.23%	10.47%	6.98%	9.88%	31.40%	15.12%	20.93%	41.86%	43.60%	14.53%	37.79%	31.40%	25.58%	5.23%

The analysis reveals that Cluster 0 demonstrates statistical significance compared to the remaining clusters. This cluster accounts for 32.84% of the total revenue, 34.09% of the profit, and 36.09% of the sales volume. Cluster 0 is primarily situated in a Residential area, characterized by a mid-capacity store, a limited presence of nearby schools and kindergartens within a 1km radius, and low availability of parking spaces.

b) Within the cluster

Based on the result of the k-means algorithm, we are determining within each clustered location which categories are performing high to low values.

〈Table 6〉 Category performance of clustered locations

Attribute	Revenue							Profit						
Category	0	1	2	3	4	5	6	0	1	2	3	4	5	6
Automotive Parts & Accessories	0.01%	0.03%	0.03%	0.00%	0.02%	0.02%	0.01%	0.02%	0.05%	0.04%	0.00%	0.02%	0.02%	0.00%
Beverages	16.79%	0.14%	29.95%	16.27%	16.56%	15.73%	13.94%	14.49%	0.23%	27.00%	16.40%	14.60%	14.48%	14.13%
Building Supplies & Tools	0.04%	0.11%	0.07%	0.01%	0.08%	0.07%	0.06%	0.05%	0.15%	0.06%	0.02%	0.07%	0.08%	0.06%
Books & Stationary	2.38%	4.07%	1.24%	1.07%	3.53%	2.44%	2.50%	4.75%	7.34%	1.60%	1.80%	5.75%	3.42%	4.78%
Consumer Electronics	6.32%	79.15%	2.50%	0.91%	7.78%	8.53%	10.22%	4.16%	66.50%	2.00%	1.07%	5.88%	6.47%	5.52%
Apparel and accessories	1.41%	2.82%	2.74%	0.41%	1.90%	1.98%	0.83%	1.72%	5.96%	3.91%	0.58%	2.73%	2.50%	1.01%
Fresh Food	4.85%	0.00%	2.08%	8.37%	4.37%	4.25%	4.46%	4.69%	0.00%	1.76%	8.46%	4.31%	4.22%	2.65%
Health & Wellness	0.22%	0.35%	0.23%	0.24%	0.47%	0.30%	0.16%	0.24%	0.34%	0.23%	0.24%	0.46%	0.32%	0.16%
Housewares & Home Decor	5.16%	9.28%	3.36%	2.34%	5.41%	6.12%	4.73%	5.73%	12.09%	4.07%	2.95%	6.73%	7.07%	5.70%
Obsolete Products	0.45%	1.10%	0.35%	0.62%	0.21%	0.60%	0.66%	0.54%	1.62%	0.41%	0.68%	0.22%	0.73%	0.76%
Beauty & Personal Care	11.78%	0.28%	5.16%	12.21%	10.26%	11.22%	13.03%	12.59%	0.53%	5.44%	12.39%	10.10%	12.01%	14.19%
Packaged Foods	48.82%	0.05%	47.75%	57.12%	47.09%	46.46%	47.67%	48.62%	0.10%	47.66%	54.85%	46.71%	45.75%	48.03%
Sport & Travel	0.58%	0.83%	2.27%	0.17%	0.90%	0.84%	0.54%	0.72%	1.44%	2.78%	0.19%	1.17%	1.10%	0.64%
Toys & Hobbies	1.19%	1.79%	2.26%	0.26%	1.42%	1.40%	1.03%	1.68%	3.65%	2.14%	0.38%	1.28%	1.84%	1.46%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

In Cluster 0 and Clusters 2-6, the top category consistently appears to be "Packaged food," indicating its strong quantitative performance across these clusters by showing more than 40% share of the total amount. The only exception found is Cluster 1, where the top-performing category in revenue and profit is "Consumer electronics."

"Beverages" are the second-in-line best-performing category in clusters 0, 2-6, followed by the "Beauty&Personal care" category.

c) Within the category

Based on the k-means algorithm, within the category in which characterized retail stores' locations have ranked highest and lowest.

〈Table 7〉 Highest and lowest performing cluster in each category

Attribute	Cluster	Revenue		Profit		Capacity				Type of location								School/Kindergarten			Parking			
		Rp	%	%		HIGH	LOW	MID	NO	GER	INDUS TRIAL	OFFICE	ONLIN E	RESIDE NCE	RURAL	SHOPPI NG	HIGH	LOW	NO	HIGH	LOW	MID	NO
Automotive Parts & Accessories	1	26.86%	20.65%	1.74%	1.16%	3.49%	0.58%		1.74%	2.91%	0.58%	0.58%				0.58%	1.16%	2.91%	2.91%	4.07%	1.16%	1.16%	0.58%
Beverages	0	2.10%	2.24%	6.40%	12.79%	13.37%	4.07%	3.49%	0.58%	1.74%	6.40%	16.28%	2.33%	8.14%		20.35%	11.05%	2.33%	11.05%	12.79%	8.72%	4.07%
	4	22.29%	20.70%	6.98%		1.74%				1.74%	0.58%			2.91%	3.49%	4.07%	2.33%	2.33%	5.81%		2.91%	
Building Supplies & Tools	4	0.82%	0.84%	0.58%	1.74%	6.40%	5.23%		0.58%	0.58%	5.23%	1.74%	0.58%	5.23%	2.91%	5.81%	6.40%	1.74%	0.58%	5.23%
	3	5.90%	5.55%	0.58%				0.58%									1.16%		0.58%	0.58%
Books & Stationary	5	23.25%	22.77%	5.81%	2.91%	4.65%	1.16%	2.91%	0.58%	1.16%	1.16%	4.07%	2.91%	1.74%		3.49%	8.14%	2.91%	4.07%	4.65%	4.65%	1.16%
	3	26.89%	25.49%	8.14%	3.49%	8.14%	0.58%	2.33%		1.74%	0.58%	5.81%	4.07%	5.81%	8.14%	9.88%	2.33%	8.14%	5.23%	6.40%	0.58%
Consumer Electronics	1	1.99%	1.58%	6.98%	1.74%	4.65%		1.16%	0.58%	4.65%	6.40%	0.58%			4.07%	5.23%	2.33%	4.07%	2.33%	4.65%
	2	7.98%	6.65%	1.16%	0.58%				1.74%							0.58%	1.16%		0.58%	1.16%
Apparel and accessories	1	21.30%	22.98%	13.37%	4.65%	4.07%	4.65%		1.16%		3.49%	12.79%		2.91%	15.70%	3.49%	0.58%	2.33%	13.95%
	2	20.48%	19.61%	2.33%	0.58%	4.65%		1.74%	1.74%		2.91%	1.16%		3.49%	2.33%	1.74%	4.07%	1.16%	2.33%
Fresh Food	5	5.37%	5.31%	1.16%	15.70%	10.47%	5.23%	0.58%	1.16%	2.33%	5.23%	15.12%	1.74%	6.40%	18.02%	8.14%	6.40%	10.47%	11.05%	5.81%	5.23%
	2	21.08%	22.76%	6.98%	9.88%	8.72%	2.91%	1.74%	2.33%		11.63%	3.49%	3.49%	11.05%	12.21%	2.33%	5.81%	8.14%	7.56%	3.91%	4.07%	5.23%
Health & Wellness	3	0.93%	-3.71%	4.07%	2.33%	8.14%	5.23%		1.16%	1.16%	5.23%	2.91%	4.07%	5.23%	5.23%	5.81%						
	5	5.89%	5.42%	0.58%										0.58%	0.58%			0.58%	
Housewares & Home Decor	0	20.40%	19.14%	2.33%	2.33%	1.74%		1.16%			2.33%	1.16%	0.58%	3.49%	2.93%	0.58%	2.33%	1.74%	2.33%
	1	2.18%	2.50%		6.40%	1.74%	4.65%		0.58%	1.16%	4.65%	6.40%			4.07%	4.07%	4.65%	1.74%	3.49%	2.91%	4.65%
Obsolete Products	4	22.39%	22.23%	8.72%	1.74%	8.14%		2.33%	0.58%		4.07%	4.65%	6.98%	0.88%	8.14%	0.58%	8.72%	2.91%	0.98%
	3	26.56%	27.35%	7.56%	6.40%	6.98%			4.65%	5.23%	5.23%	8.72%	10.47%	1.74%	6.98%	5.23%
Beauty & Personal Care	0	2.31%	2.37%	8.14%	11.05%	11.05%	5.23%	2.91%	2.33%	1.16%	5.23%	12.79%	4.65%	6.40%	12.79%	15.12%	7.56%	9.30%	12.79%	8.14%	5.23%
	1	1.10%	1.08%	0.58%	2.33%	6.98%	5.23%			0.58%	2.33%	0.58%	5.23%	5.23%	3.49%	6.40%	6.98%	2.33%	0.58%	5.23%
Packaged Foods	0	25.16%	25.43%	8.72%	8.14%	4.65%		4.07%	0.58%		10.47%	2.91%	3.49%	6.98%	13.95%	0.58%	1.74%	11.63%	8.14%
	2	20.91%	20.92%	4.65%	4.07%	7.56%		2.33%	2.91%	0.58%		3.49%	3.49%	3.49%	5.81%	6.98%	3.49%	8.14%	3.49%	4.65%
Sport & Travel	2	0.97%	1.04%	0.58%	2.33%	6.98%	5.23%		0.58%	1.16%	5.23%	2.33%	2.33%	0.58%	5.23%	5.23%	3.49%	6.40%	6.98%	2.33%	0.58%	5.23%
	3	23.61%	23.79%	8.72%	0.58%	1.74%				2.91%	4.07%				2.33%	1.16%	4.65%	4.65%	1.74%	5.81%	1.16%	4.07%
Toys & Hobbles	4	3.41%	3.58%			0.58%		0.58%									0.58%	0.58%	
	1	6.14%	-0.30%	0.58%				0.58%								0.58%			0.58%
	4	26.89%	22.79%	7.56%	2.33%	10.47%		5.23%	1.16%	2.33%		6.98%	1.16%	3.49%	6.98%	11.05%	2.33%	5.23%	8.72%	6.40%

For example, The "Beverages" category's highest earning cluster is 0 in the high-capacity store located in a shopping street with a high number of schools and kindergarten surroundings within a 1km radius with high parking capabilities. On the other hand, the lowest revenue cluster for this category is cluster 4, which has mid-capacity located in a shopping street with no schools and kindergartens in presence within a 1km radius of the store with high parking capabilities.
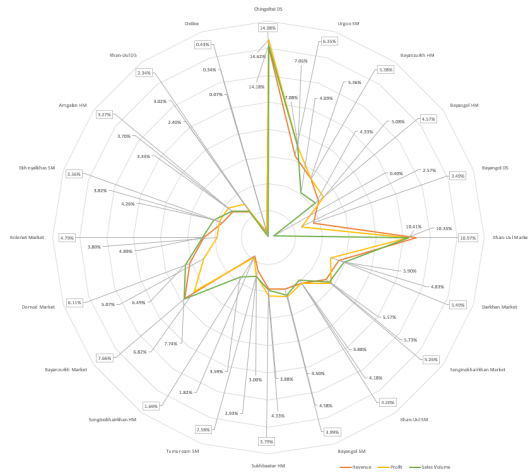
d) Within the store

Each store's cluster changes depending on the yearly performance metrics. Based on the result of the k-means algorithm, we are determining what characterized clusters have high-performance values within offline stores.

For example: Store "Bayangol Supermarket" moved between two clusters over the years. Which highest earning cluster number is 0, with a higher average retail price. Dominant value cluster has a mid-capacity store in a residential area with a few schools and kindergartens available in a 1km radius with low parking capabilities.

This marks the conclusion of the outcomes derived from the k-means clustering algorithm regarding different attributes.

〈Table 8〉 Highest and lowest performing cluster in each offline location

Store	Cluster	Revenue		Capacity				Type of location							School/Kindergarten			Parking			
		Rp	%	HIGH	LOW	MID	GER	INDUSTRIAL	OFFICE	ONLINE	RESIDENCE	RURAL	SHOPPING	HIGH	LOW	NO	HIGH	LOW	MID	NO
Bayangol SM	0	13,187	64.78%	9%	11%	16%	3%	2%	2%		8%	8%		13%	22%	15%	12%	15%	10%
	5	12,558	55.22%	1%	2%	15%	9%	1%	2%	5%	16%	2%	2%	5%	9%	7%	6%	13%	6%	5%
Bayanzurkh HM	1	32,941	59.13%	9%	11%	16%	5%	2%	2%		12%	8%		19%	22%	12%	12%	15%	10%
	3	34,870	40.87%	11%	2%	9%	3%	1%	3%		3%	4%	2%	5%	9%	2%	5%	4%	8%
Songinokhairkhan Market	3	23,546	78.68%			3%										3%				
	0	23,950	17.61%	3%	11%	16%	5%	2%	2%		12%	8%	3%	19%	22%	2%	12%	15%	6%	5%
Sukhbaatar HM	4	24,465	3.71%	2%	15%	9%	1%	1%	3%	5%	16%	2%	2%	13%	10%	7%	6%	13%	4%	8%
	5	19,025	66.89%	9%	11%	16%	5%	2%	3%		3%	4%		5%	9%	7%	5%	4%	8%
Tumur-zam SM	0	23,670	16.85%	11%	2%	3%	3%	1%	3%		16%	2%		5%	9%	2%	12%	15%	4%	8%
	5	17,900	16.24%	2%	15%	9%	1%	1%	3%		5%	16%	2%	2%	13%	10%	7%	6%	13%	6%	5%
Bayanzurkh Market	4	17,713	81.84%	2%	15%	9%	1%	1%	2%	5%		4%	2%	2%	3%	2%		2%		
	2	15,464	18.16%	9%	11%	16%	5%	2%	2%		12%	8%	8%	19%	22%	25%	12%	15%	10%
	0	10,189	50.26%	11%	2%	3%	3%	1%	2%		5%	4%	2%	5%	9%	2%	5%	4%	8%
Darkhan Market	0	10,687	35.21%	4%	1%		1%		2%			1%			2%	2%		3%		2%
	3	24,066	14.53%	9%	11%	16%	5%	2%	2%	12%	8%		19%	22%	15%	12%	15%	10%
	5	50,979	58.58%	3%	15%	16%	5%	2%	2%		12%	8%		19%	22%	15%	12%	15%	10%
Dornod Market	4	14,377	19.42%	4%	1%		2%			2%		1%			2%	2%		3%		2%
	5	54,002	15.13%	11%	2%	3%	3%	1%	3%	5%	16%	2%	2%	5%	9%	2%	12%	15%	4%	8%
	0	15,675	6.87%	2%	15%	9%	1%	1%	3%		5%	4%	2%	5%	9%	7%	6%	13%	6%	5%
Bayangol SM	0	50,568	54.85%	9%	11%	16%	5%	2%	2%		12%	8%	8%	19%	22%	25%	12%	15%	10%
	5	28,792	26.01%	11%	2%	3%	5%	3%	1%	3%		5%	4%	2%	5%	9%	2%	5%	4%	8%
Erdenet Market	4	33,526	19.14%	4%	2%		2%			2%		1%			2%	2%		3%		2%
	5	56,684	10.98%	2%	15%	9%	1%	1%	2%	5%	16%	2%	2%	13%	10%	7%	6%	13%	4%	8%
Khan-Uul Market	3	30,770	45.69%	11%	2%	3%	5%	3%	1%	3%		4%	2%	5%	9%	2%	3%		2%
	4	34,318	54.31%	4%	1%		2%			2%		1%			2%	2%		3%		2%
Bayangol DS	3	67,721	88.69%			3%								3%			3%		
Online	4	40,575	11.31%	1%	2%	15%	9%	1%	1%	3%	16%	2%	2%	13%	10%	7%	6%	13%	6%	5%
	0	187,572	0.43%	2%	15%	9%	1%	1%	2%	5%	16%	2%	2%	13%	10%	25%	12%	15%	10%
Urgoo SM	0	9,184	85.69%	9%	11%	16%	5%	2%	2%		12%	8%		19%	22%	15%	12%	15%	10%
	5	16,938	14.31%	11%	2%	3%	3%	1%	3%		5%	4%	2%	5%	9%	2%	5%	4%	8%
Khan-Uul SM	0	16,528	45.91%	9%	11%	16%	5%	2%	2%		12%	8%		19%	22%	15%	12%	15%	10%
	3	20,162	40.21%	11%	2%	3%	5%	3%	1%	3%		4%	2%	5%	9%	2%	3%	4%	8%
Chingeltei DS	3	13,000	13.88%	1%	15%	9%	1%	1%	2%	5%	16%	2%	2%	13%	10%	7%	6%	13%	6%	5%
	5	8,556	14.08%	5%											5%				
Amgalan HM	0	25,024	43.42%	9%	11%	16%	5%	2%	2%		12%	8%	8%	19%	22%	25%	12%	15%	10%
	4	25,332	37.61%	2%	15%	9%	1%	1%	2%	5%	16%	2%	2%	13%	10%	7%	6%	13%	4%	8%
Songinokhairkhan HM	3	27,734	18.97%	11%	2%	3%	3%	1%	3%		3%	4%	2%	5%	9%	2%	12%	15%	4%	8%
	5	11,070	55.44%	9%	11%	16%	5%	2%	2%		12%	8%		19%	22%	15%	12%	15%	6%	5%
Khan-Uul DS	5	9,261	7.56%	2%	15%	9%	1%	1%	3%		5%	4%	2%	5%	9%	7%	6%	13%	6%	5%
	3	17,336	39.00%	11%	2%	3%	3%	1%	3%		3%	4%	2%	5%	9%	2%	12%	15%	4%	8%
Bayangol HM	0	26,615	52.97%	1%	15%	9%	11%	1%	2%	5%	16%	2%	2%	13%	10%	7%	6%	13%	6%	5%
	3	11,763	47.03%	9%	11%	16%	5%	2%	2%		12%	8%		19%	22%	15%	12%	15%	10%
	4	22,112	60.36%	9%	11%	16%	5%	2%	2%		12%	8%	8%	19%	22%	25%	12%	15%	10%
	5	26,271	39.64%	11%	2%	3%	3%	1%	3%		3%	4%	2%	5%	9%	2%	5%	4%	8%

5.2 Redesigned role of the offline store

When developing a new "TO BE" strategy, adopting a long-term perspective rather than focusing solely on the immediate short-term is essential. Effective planning, communication, cultural alignment, process integration, and performance monitoring are crucial regardless of the specific integration strategy. However, the strategy should align with the overall objectives of the integration and aim to maximize synergies, minimize disruption, and create value for all stakeholders involved.

Here we present redesigning concepts for Mongolian retailers by further exploring our findings from a store point of view to design a new role for existing offline stores.

After analyzing the clustering results, most stores underwent substantial changes over the years, which could be affected by various factors. Therefore, we aim to pinpoint areas experiencing a decline in value and offer them a new purpose to boost their earnings and profitability.

Depending on the cluster analysis, when stores move between different clusters, this indicates a

〈Figure 5〉 Store performance
(revenue, profit, volume)

change is needed for this location when the store keeps changing to low-performing clusters. Based on the revenue and profit percentage performance, we could divide all locations into three categories according to the ABC analysis. Best performing – keep it as it is, neutral or stagnated – need more observation before changing, and worst perform-ing – need a new strategy before store operation ceases.

There are eight specific locations where the metrics have decreased over time, and it is crucial to make changes. If these locations continue to operate without improvement, maintaining them will become increasingly challenging. To achieve positive outcomes in the near future, companies must implement robust and efficient changes.

〈Table 9〉 Low−performance stores

Year	Low performance															
Store	Cluster	Profit %	Cluster	Profit %	Cluster	Profit %	Cluster	Profit %	Cluster	Profit %	Cluster	Profit %	Cluster	Profit %	Cluster	Profit %
	Baraangol HM		Chingeltei DS		Urguu SM		Amgalan HM		Baraangol SM		Khan-Uul Market		Tumur-nam SM		Khan-Uul SM		Baraangol DS	
2013	5	16.89%	3	14.87%	0	16.51%	6	16.46%	0	17.23%	5	14.54%	6	16.93%	6	16.37%	1	14.55%
2014	5	17.07%	3	16.66%	0	16.97%	6	16.27%	0	17.37%	5	13.65%	6	17.17%	6	18.34%	1	15.46%
2015	0	14.42%	3	13.75%	0	14.72%	6	14.92%	0	15.04%	5	12.36%	6	15.09%	6	14.52%	6	18.73%
2016	0	14.43%	3	13.81%	0	14.97%	6	15.10%	0	15.15%	5	12.58%	6	15.25%	6	13.83%	6	17.07%
2017	0	14.61%	3	13.72%	0	14.91%	6	15.07%	6	15.44%	5	12.83%	6	15.50%	6	13.65%	0	7.38%
2018	0	14.05%	3	13.09%	0	14.16%	6	14.98%	6	14.70%	4	12.22%	6	14.72%	6	13.00%	6	8.21%
2019	0	14.15%	3	13.13%	0	14.36%	0	15.03%	0	14.96%	4	12.30%	6	14.69%	5	13.14%	1	6.88%
2020	0	14.14%	3	13.12%	0	14.31%	0	14.08%	0	14.61%	4	12.13%	6	14.48%	6	12.94%	1	9.81%
2021	5	14.25%	3	13.48%	5	13.76%	5	14.92%	6	14.56%	4	12.20%	0	14.68%	5	13.05%	1	5.68%

Notably, 56% of value-decreasing locations are within a singular district known as Bayangol. Therefore, the district's overall life value could be the main factor that significantly impacts these stores.
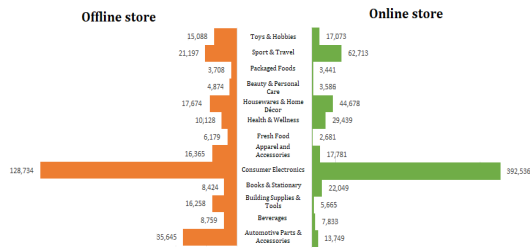
5.2.1 Fulfillment hub store

The first strategy is to add the role of MFC - micro fulfillment centers to the existing offline channels. Integration compliments the best of both channels, with easy online product selection and immediate offline store availability. We are targeting Chingeltei DS and Khan-Uul market stores for this strategy based on the store's high capacity (more than 3000+ m2) and high parking lot availability.

Mentioned stores should take the additional role as a warehouse to help their growing online channel to keep more stock in the city center to make it easier for shipping for online purchases; thus, the store needs a new assortment plan to match their increased activity because their de-mand will change when the store becomes integrated. Adjusting the assortment plan to en-sure optimal product offerings involves selecting a balanced mix of products while phasing out un-derperforming ones.

To increase their sales, the store must closely analyze the currently rising online channel cate-gories to compare which category has sold at a higher average retail price than offline stores. By comparison, offline shops must adjust the follow-ing categories' assortment plan to increase their sales: Sport & Travel, Housewares & Home Décor, Health & Wellness, Consumer Electronics, Books & Stationery.

There are similar practices done by Best Buy to change their store status to a fulfillment hub

	Offline store		Online store	
Toys & Hobbies	15,088		17,073	
Sport & Travel	21,197			62,713
Packaged Foods	3,708		5,441	
Beauty & Personal Care	4,874		3,586	
Housewares & Home Décor	17,674			44,678
Health & Wellness	10,128		29,439	
Fresh Food	6,179		2,681	
Apparel and Accessories	16,365		17,781	
Consumer Electronics	128,734			392,536
Books & Stationary	8,424		22,049	
Building Supplies & Tools	16,258		5,665	
Beverages	8,759		7,833	
Automotive Parts & Accessories	35,645		13,749	

〈Figure 6〉 Comparison between the average retail price of offline and online store

location by displaying less of the traditional products but focusing more on the space for fulfilling online orders by offering curbside pickup. As a result, Best Buy expects a larger percentage of overall sales on its website and app than in its stores. Although stores will continue to offer products on display and staff to assist customers, they will also serve as warehouses for employees to fulfill e-commerce orders and as convenient pick-up locations for online purchases.

When a store has the potential to sell products with higher average retail prices, it will reflect in the store's overall profit. Low-performance stores integrate with online stores to become fulfillment hub locations; they focus less on sales volume (qty). Instead, they would shift their focus to the quality of the sales. Only the most popular items are displayed on the sales floor, while a wider selection is kept in storage and can still be purchased. A significant mistake when running multiple stores is not localizing your assortments and experiences. When offerings do not feel fresh or unique to different audiences, this makes it challenging to maintain customer retention.

The store needs a standard for turnover days to ensure products are within their expiry date, which will vary from category to category. If products are extended their average turnover days,

a system must analyze and alert floor sales associates to return the item to the warehouse. One thing to add when it comes to integrated stores is to not only calculate the average sales volume of their location; they have to add the average sales volume of the online store as well.

The pandemic proved to us that our human resources could have a severe impact for many reasons; thus, companies are now investing millions in intelligent solutions for selling products without ever needing personnel. One of the integrated store's advantages is to place your products in an online and offline channel together. Putting a QR code next to the price display could explain the specifications of products thoroughly so we can even reduce the number of staff in the future. A static QR code is an inexpensive solution that people with a smartphone can access easily. Also, it could give more exposure to the company's online channel. With a good security system, the store could function without any personnel for product explaining and selling. Oasis, the fashion retailer in the UK, has also added QR codes to their products, which lead customers to a website where they can give feedback. All their sales associates are equipped with iPads, offering real-time and precise product information. If an item is unavailable, the staff can promptly place an online order for you, which can be shipped to your doorstep. The iPad also functions as a point-of-sale system, allowing sales associates to process your purchase from any location within the store. This will enable customers to spend less time at the cashier; during holiday or event sessions waiting in line becomes one of the most frustrating activities of the shopping experience.

5.2.2 Experience hybrid store

The second integration strategy is for stores with a mid to high capacity (more than 2000m2); in this case, we chose Bayangol DS, Urgoo SM, and Bayangol HM. They are located in a shopping district in a residential area with a high parking lot, high availability of school and kindergarten presence, and right next to the main road. To modify the behavior of existing customers and attract new ones, we could transform the store into a hybrid experience store rather than a typical supermarket.

When the firm plans to open an experimental hybrid store in a particular neighborhood, tailoring your concept to fit the location and the local community is crucial, this approach fosters a connection with potential customers. In addition, it enhances their retail experience, making it more memorable. Take Ikea as an example. Although the brand is well-known worldwide, it excels in localizing its products. Before establishing a new store, Ikea conducts thorough research, such as visiting residents' homes to discover their preferences. This approach has enabled the company to subtly tailor its product offerings while preserving the distinct features of its physical stores.

As we further explore, successful change has been done to foreign companies such as E-mart in South Korea, where they implemented new mall-type stores by changing their existing locations into a much more hybrid store, which added specialty corners into their fresh food selection to adopt smart farm technology to cultivate its own vegetables to provide fresh items to its customers is just a start. Moreover, depending on the capacity of the whole store, a generous amount of squire feet belonged to more experience-based ac-

tivities, which resulted in its sales jumping 18%, and the number of visitors went up 23% in the first month after reopening from the same period last year.

Added businesses inside the store should point towards keeping their customers within their store as much as possible with value-added activities such as Kids' play zone, pet zone, small clothing boutiques, cinemas, photo zone, and foot courts to give reasons to visit their stores more often by increasing customer experience and maximizing their spending time on store grounds. Thus, mid to high-capacity stores could adopt this change in Mongolia.

In business-to-consumer relationships, loyalty is a crucial measure of the strength of the relationship. One of the classic encouraging marketing tools for hybrid retailers is to use loyalty programs to forge emotional bonds with their customers. For example, food Lion's upgraded rewards program allows customers to redeem digital coupons when ordering online for in-store pick-up or home delivery. Safeway's loyalty program app offers personalized deals based on members' shopping habits and savings history. Kroger's Community Rewards program allows members to select a non-profit organization they support to receive funds every time they shop. Starbucks' multi-channel marketing strategy's focal point is its loyalty rewards program. Due to the strength of the perks, those who use Starbucks Rewards tend to choose Starbucks over any competing coffee shop. This incentive has allowed Starbucks to cultivate fierce loyalty among its reward customers. To implement a similar strategy for a hybrid store, create a customer loyalty program that incentivizes more frequent visits. The

perks of the program should be both attainable and aspirational. These strategies aim to provide value and convenience to customers while also creating a sense of community and shared purpose through philanthropic efforts.

5.2.3 Neighborhood market

The third strategy focuses on Tumur-zam SM, Bayangol SM, and Khan-Uul SM. In other words, value decreasing low-capacity stores (less than 1500 m2) in the residential area with low parking capability and low presence of schools and kindergartens. Since the capacity is low from the beginning, it is hard to implement significant changes like experience-focused hybrid stores or fulfillment hub stores, so these stores need to make many small changes to increase their foot traffic.

We suggest making it more of a "neighborhood market" to open a food court area offering a signature dish to draw customers by contracting popular restaurants to open their branches inside their stores to constantly give reasons to visit their stores more often as possible.

Also, to increase sales, low-capacity stores should add "Digital touchpoints," which is the placement of additional touchpoints in the store that requires additional desktop computers or touchscreen for three primary purposes. 1st is to help customers who want products that are not available for immediate purchase so the store's trained floor sales associate can access and order them for the customer. 2nd purpose is to showcase new products and provide complete assortment availability information, letting customers know which product is available at what isle to ensure not to waste customers' time. 3rd is for survey purposes which results could vary from evaluating customer satisfaction and behavior.

Use web rooming and showrooming concepts to take advantage of the best of both worlds. Showrooming is a consumer behavior where customers visit a physical retail store to examine and experience a product firsthand but then make the actual purchase online; the opposite of showrooming is web rooming, where shoppers seek information online and buy offline, which is the dominant form of research shopping. For example, apple stores provide mobile devices in their offline store where customers can search for more information about their products and order them. An added benefit of customers using store Wi-Fi networks is that firms can communicate with their customers through mobile devices, track their behavior, and use that information for repeated purchases.

Another channel that could be added to the neighborhood market is called the virtual (grocery) store. Pioneered by Tesco's Homeplus supermarket chain in South Korea, this format brings the store to the people, which consists of highly realistic poster shelves displayed in crowded public places such as subway stations. Then, using an app, consumers can scan the Q.R. codes of the products to put them in their online basket. Next, consumers can order the selected items to be delivered home. Similar practices done by Jumbo's virtual grocery store are at Utrecht, Netherlands, bus stations.

It is essential in integrated stores to manage stock levels and determine profit margins for each item. One way to achieve this is by categorizing products as either "fast-moving" or "slow-moving." This can be done using the inventory principle.

Lastly, store personnel, such as sales associates

and cashiers, are the primary workforce to advise the retail customer on all integration strategies. However, the sales will be unsuccessful due to needing more information about promotions, so information inside the store is just as valuable as informing customers.

The above-mentioned integration strategies need the following steps to finalize the process:

Pre-integration Planning: Before the integration process begins, thoroughly analyze the acquiring and target stores. Identify their strengths, weaknesses, market positioning, customer base, and financial performance. Then, determine the strategic fit and potential synergies between the two.

Integration Team Formation: Assemble a dedicated integration team consisting of individuals with expertise in various areas such as operations, finance, human resources, marketing, and IT. This team will oversee the integration process and ensure a smooth transition.

Communication and Transparency: Effective communication is vital during integration. Communicate the integration plans, goals, and timelines to employees, customers, suppliers, and other stakeholders. Address any concerns or uncertainties promptly and maintain transparency throughout the process.

Culture Integration: Pay attention to the cultural aspects of integration. Understand and appreciate the unique cultures of both stores and develop a plan to blend them. Encourage open dialogue, foster collaboration, and promote a positive, unified company culture.

Streamline Operations: Assess the operational processes of both stores and identify opportunities for consolidation and efficiency improvements. Streamline inventory management, supply chain

logistics, and back-office operations to eliminate redundancies and optimize resource utilization.

Brand Integration: Evaluate stores' brand equity and customer perception. Determine the best approach to integrate the brands, whether it involves rebranding, co-branding, or maintaining separate brand identities. Develop a comprehensive brand integration strategy that aligns with the overall business objectives.

Human Resources Integration: Integrate the workforce of both stores by aligning job roles, responsibilities, and compensation structures. Evaluate staffing requirements and address any redundancies or talent gaps. Provide training and support to help employees adapt to the changes and foster a harmonious work environment.

Customer Transition Plan: Develop a customer transition plan to ensure a seamless experience for existing customers. Communicate any changes in product offerings, store locations, loyalty programs, or pricing structures. Prioritize customer satisfaction and maintain high service standards throughout the transition.

IT Systems Integration: Assess the IT infrastructure of both stores and plan to integrate systems, processes, and databases. Ensure seamless integration of point-of-sale, inventory management, customer relationship management (CRM) systems, and other critical IT components.

Performance Monitoring and Continuous Improvement: Monitor the performance of the integrated store using predefined metrics and key performance indicators (KPIs). Continuously evaluate the effectiveness of the integration strategy and make necessary adjustments to optimize performance. Solicit feedback from employees and customers to identify areas for improvement.

The classic integration strategy aims to achieve operational synergies, maximize cost savings, maintain customer loyalty, and create a unified and successful store.

VI. Conclusion

The retail industry has undergone significant changes over the past decade, with a shift towards online-oriented shopping. This has been driven by technological advancements, increased use of mobile devices, and changing consumer behavior as more and more people prefer the convenience and flexibility of online shopping. One of the critical advantages of online shopping is the ability to access a broader range of products and services than what is available in traditional offline stores. In addition, many consumers now use their smartphones and tablets to browse products, compare prices, and purchase online. This has led to a rise in mobile commerce, or e-commerce, as retailers work to optimize their websites and mobile apps for mobile devices.

In addition, consumers now expect a seamless and personalized shopping experience across all channels, whether online, in-store, or mobile devices. This has led to the growth of omnichannel retailing, where retailers integrate their online and offline channels to provide customers with a consistent and seamless experience.

Offline (physical) channels, online channels, multi-channel and omnichannel strategies are popular in practice and academic research. Business owners must understand their quantitative measures to develop game plans when competing with growing new digital channels. Therefore, integrated stores are the inevitable next step when retailers

seek a new avenue to expand their business.

Our approach involved selecting a national retailer and analyzing their current store location selection and mix strategy across various locations within the country. By gathering empirical data on actual sales, we aimed to gain insights that would enable us to recommend an effective offline and online integration strategy. Our ultimate goal was to help retailers achieve long-term strategic and competitive advantages.

Step I: One of the organized offline retailers in Mongolia was selected to be analyzed with stores across a) shopping streets, b) industrial areas, c) residential areas, d) ger zones, e) office districts, and f) rural provinces offering multiple categories and brands at the same time.

Step II: Store-wise, the actual sales records containing a) revenue, b) profit, c) sales volume d) average retail price of SKU for nine years were collected.

Step III: Data translated from Mongolia to English to ensure readers understand the data better.

Step IV: Secondary data with sale records were analyzed using the k-means clustering method.

Step V: In this stage, insights and inferences from the research findings were used to propose a way forward for offline retailers to enable them to design an ideal strategy for integrated stores.

Based on the "cluster-to-cluster" analysis, clusters exhibiting higher revenue and profitability are predominantly situated in **residential areas** with various capacities and parking capabilities. Conversely, low-performing clusters have mid-capacity located in a mixed area with high parking capability.

Based on "within-the-category" analysis, "Packaged food" and "Beverages" are the best-

performing categories in most clusters, such as **clusters 0,2,3,4,5,6**. Therefore, these are the less problematic categories because they can convert the high potential in terms of traffic into revenue. On the other hand, "Sport & Travel," "Health & Wellness," "Building Supplies & Tools," and "Automotive Parts & Accessories" are the low-performing categories with low values quantitative indicators. Considering their low ability to generate revenue, managers could decide, for example, to move these categories towards the less strategic and low-performance store areas, modifying the store layout.

The impact of surrounding characteristics has a different influence on each point of sales. Further, we suggest new integration strategies in Mongolian retail stores to give consumers a seamless experience by identifying the relationship between clustered zones and product categories in the retail market.

Our research indicates three practical approaches: establishing a fulfillment hub store that bridges the gap between online and offline shopping, creating an experience store that encourages customers to stay longer on the premises, and combining two unrelated channels to enhance traffic based on the store's unique features. The main idea behind integration strategies is that customers should be able to find your products or services easily through any available device or platform without the need to search for a specific location or team. This could include accessing your product through various means such as phones, laptops, tablets, cars, or buses. Implementing such an approach will likely increase customer satisfaction, loyalty, and repeat business.

There are many different integration levels, all with their upsides and downsides. The result of channel integration could change traditional stores' business model to acquire multiple roles, giving them more chances to succeed within the emerging new online shopping era. The thesis outcome will be used in better decision-making for the business world.

The study has revealed that retail stores need new integration strategies to stay in business in Mongolia. Further, the researchers could investigate multi-channel integration's short and long-term impacts on firm profitability. Besides retail companies, what other types of firms are more likely to benefit from multi-channel integration than others would be a helpful guide to firms in their decisions about investing in multi-channel integration and provide insights into best practices for implementation.

This research relied on quantitative data, so to further analyze, we need qualitative data with unknown factors that may influence Mongolian consumers' purchasing behavior in an integrated channel. Therefore, further topic analysis could combine store characteristics with consumer buying behavior.

In this paper, we are focusing on the data collected from supermarkets, hypermarkets, and department stores, an extension of this thesis could be a quantitative analysis of convenience stores. Based on the clientele of convenience stores, results could show different findings than traditional stores.

For further research, we recommend that integrated channels take a deep look at their assortment, planning to concentrate on a sub-category level to ensure all shelf spaces have their role in the store.

사 사

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