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A Proposal on the Agricultural Distribution Structure by Leveraging Online Platform and Smart Farm Technology

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온라인 플랫폼과 스마트 팜 기술을 활용한 농산물 유통구조 혁신 방안 제안

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Executive Summary (English)

The distribution structure of domestic agricultural products is very diverse and complex. From production to consumers, it encompasses five to seven stages, including - farmers, producer organizations, production distributors, wholesale market corporations, intermediate wholesalers, retailers and consumers – this creates a big gap between production prices and final consumer prices. As a representative example, in the case of onion prices of 2016, the price traded at 1,600 won per net (2 kg) in production rose to 4,200 won in the final consumer market.

To solve this problem, a forum was held in 2022 at the National Assembly to find ways to rationalize the agricultural wholesale market under the auspices of the Presidential Committee on Agriculture and Rural Affairs. The topic of the discussion was the issue of 'agricultural product price', and in particular, the issue of fairness in large agricultural wholesale markets such as ‘Garak Market’ was one of the key agendas. In favor of the introduction of the public wholesale market, one sided asserted, "In order for agricultural products to be traded at fair prices and reasonable prices, it seems necessary to introduce and supplement various systems”. In opposition to this, the opinion that "the agricultural product market should respect the logic of the natural market and oppose the name of the ‘public interest type’ attached to the market wholesaler itself" was also expressed. In addition, there was an opposition to the public wholesale market, saying, "the discussion on the publicity of the public wholesale market should be based on the trust of all market participants. Therefore, public institutions should not expand their authority and autonomy to those participants."

The most chronic and unresolved challenges in the domestic agricultural product distribution market are "high distribution costs" and "price volatility." Diverse problems such as small and old producers, production structures where new products are not easily developed, lack of marketing ability of producers, lack of efficient distribution management due to short expiration date, and lack of statistical data make agricultural prices unstable. Moreover, all the burdens and damages caused by this instability are passed on to the consumers. Since costs cannot be reduced in the distribution procedure, all of these costs are reflected in the final consumer price. Therefore, the government is also making efforts to improve the distribution structure in a myriad of aspects such as improving the wholesale market transaction system, modernizing agricultural facilities, and stabilizing agricultural product supply and demand prices, but with no significant improvement thus far.

However, on the other hand, with the spread of e-commerce along with the Fourth Industrialization driven by Information and Communication Technology (ICT), new significant changes are taking place in the distribution of agricultural products. As the next-morning delivery platform as ‘Coupang’ or ‘Market Kurly’ seem to be attracting consumer attention, farmers who sell agricultural products directly through online markets are on the rise. Furthermore, with the development of multiple social network channels, it is currently possible to sell considerable quantity of agricultural products in a short period of time by using dynamic tools as influencer marketing. To add, some agricultural products are rapidly sold to consumers online when they have been

recognized as tasting good. In a word, there is a wind of change in the existing wholesale market-oriented distribution structure.

Therefore, this proposal aims to analyze and suggest whether such rationalization can be carried out through the 'online platform' method by approaching from the structural aspect of 'production-wholesale-retail'. From a market perspective, the amount of online distribution transactions in Korea has exponentially increased every year, especially since the 2020 Covid crisis. In addition, in terms of production, the accessibility of small agricultural workers using AI and IOT technologies to reduce labor and grow crops smartly has been further opened. Both market demand and supply are experiencing an environment suitable for "online distribution" Hence, the starting point of this proposal is the question of whether the chronic problems of the distribution structure of agricultural products can be solved if all these trends are well fused and utilized.

First of all, the direction of the business model will be set through data analysis of the step-by-step price increase in the current agricultural product distribution structure and the market environment. The price of each distribution stage will be collected before being integrated to analyze total price differences. Through this, comparative analysis of prices sold in farms, wholesale market, final consumer retail market will be conducted. As a result, it will derive which distribution stage has a problem and which part needs improvement.

Subsequently, based on this analysis, a new distribution model using an "online platform" will be presented to solve the fundamental problems of the existing agricultural product distribution structure. In order for an online platform to be activated, several conditions must be met. First and foremost, is that "producers" who supply products on the platform and "retailers" who sell products in the online market should participate and be connected to one another. Consequently, from a producer's point of view, this will focus on stabilizing and automating supply through the introduction of "smart farms". And from a distribution point of view, minimizing distribution margins will be the key issue. As a result, the ultimate goal of this proposal is to present a platform business model that optimizes the distribution margin of agricultural products and allows consumers to purchase excellent quality agricultural products at just and reasonable prices.

Executive Summary (Korean)

국내 농산물의 유통구조는 매우 다양하고 복잡하다. 산지에서 소비자에 이르기까지 '농가→생산자단체→산지유통인→도매시장법인→중도매인→소매업체→소비자' 에 이르는 5~7 개의 단계를 거치며 이 모든 과정에 유통마진이 추가되면서 산지가격과 최종 소비자가격의 큰 괴리가 발생하게 된다. 대표적인 사례로 2016 년 기준으로 양파 가격의 경우 한 망(2kg)에 1600 원에 산지에서 거래된 가격이 최종 소비자 시장에서는 4200 원까지 그 가격이 상승한다는 조사결과가 있다.

따라서 이러한 문제를 개선하고자 2022 년 2 월 8 일, 국회에서는 대통령직속 농어업·농어촌특별위원회 주최로 '공영도매시장 공공성 강화방안 모색을 위한 토론회'가 개최되었다. 토론의 주제는 바로 '농산물 가격' 문제였으며 특히 가락 시장과 같은 대형 농산물 도매시장의 공정성 문제를 핵심 의제로 상정하였다. 이 토론에서 공영도매시장 도입에 찬성하는 입장으로 "공정한 가격, 합리적인 가격으로 농산물이 거래되기 위해서는 지금보다 여러가지 제도를 도입하고 시행하면서 보완하는 것이 필요해 보인다"면서 "국민의 건강권과 생산자 권익 등을 위해서라면 공익시장도매인 또는 공익도매법인 등이 필요해 보인다"는 의견이 나왔다. 이와 반대의견으로 "농산물 시장은 시장의 논리를 존중해야 하며 공익형 이라는 이름이 시장도매인 앞에 붙는 것 자체에 대하여 반대한다"는 의견 또한 개진되었다. 또한 "공영도매시장의 공공성 논의는 시장참여자 모두의 신뢰가 바탕이 되어야 하는데, 공공기관이 도매시장의 갈등을 양산하고 시설물 관리의무 조차 제대로 수행하지 못하면서 권한과 자율성을 확대시켜야 한다는 주장에 동의하지 않는다"고 공영도매시장에 반대하는 입장도 존재하였다.

국내 농산물 유통 시장에서 가장 고질적이면서도 아직까지 해결되지 않고 있는 과제는 '높은 유통비용'과 '가격 변동성' 문제이다. 영세한 생산자 조직, 신제품이 쉽게 개발되지 않는 생산 구조, 생산자의 마케팅능력 부족, 짧은 유통기한으로 효율적인 유통관리 미흡, 통계자료의 부족 등 다양한 문제들이 농산물 가격을 불안정하게 만든다. 그리고 이 불안정성으로 인한 모든 부담과 피해는 고스란히 소비자에게 전가되고 있다. 유통 구조에서 비용이 줄어들 수는 없으니 그 모든 비용이 최종 소비자 가격에 반영되는 것이다. 때문에 정부에서도 이러한 문제를 해결하고 소비자의 부담을 덜기 위해서 '도매시장 거래제도 개선', '농업시설 현대화', '농산물 수급 가격안정화' 등 다양한 측면에서 유통구조 개선에 노력을 하고 있지만 뚜렷한 성과는 부족한 실정이다.

그런데 한편으로는 ICT 정보통신기술 중심의 4 차 산업화와 함께 전자상거래가 확산되면서 이러한 농산물 유통에 새로운 지각변동이 일어나고 있다. 온라인 주문을 통한 새벽 배송 플랫폼이 소비자의 주목을 받는가 싶더니 온라인 마켓을 통해 직접 생산한 농산물을 판매하는 농부들도 등장하고 있다. 이뿐만 아니라 산지에서 내다버릴 위기에 처한 농산물이 인플루언서(influencer)의 홍보 몇 번으로 완판되는 사례도 빈번히 발생하고 있으며, 맛이 좋다고 입소문을 탄 농가의 농산물은 중간 시장을 거치지 않고서도 온라인 직판의 형태로 소비자들에게 빠르게 배송되고 있다. 기존의 도매시장 중심의 유통구조에 본질적인 변화의 바람이 불고 있는 것이다.

따라서 본 연구에서는 위와 같은 농산물 유통구조의 문제를 '생산-도매'소매'라는 구조적인 측면에서부터 접근하여 '온라인 플랫폼'을 통해 이러한 구조 개편을 할 수 있을지에 대한 분석과 제안을 하고자 한다. 시장 측면에서 볼 때 2020 년 Covid 사태를 기점으로 국내 온라인 유통 거래액은 사상 최대치를 매년 갱신하고 있고 시장의 자금이 온라인으로 집중되고 있다. 또한 생산 측면에서 볼 때에도 AI 와 IOT 기술을 활용하여 소규모 농업 종사자도 노동력을 절감하며 스마트하게 농작물을 재배할 수 있는 가능성이 열렸다. 시장 수요와 공급 모두 '농산물 유통의 온라인화'에 적합한 환경을 갖춰가고 있는 것이다. 때문에 이 모든 시대적인 흐름을 잘 융합하고 활용한다면 농산물 유통 구조의 고질적인 문제들을 구조적으로 해결할 수 있지 않을까 하는 질문이 이번 연구의 시작점이다.

우선 현재 농산물 유통 구조에서의 단계별 가격 상승 현상에 대한 시장 환경과 데이터 분석을 통해 사업 모델의 방향성을 모색해볼 것이다. 유통 단계별로 가격을 수집하고 데이터를 통합해서 단계별 가격 차이 분석을 실시할 것이다. 이를 통해 농가에서 판매되는 가격과 도매시장에서 판매되는 가격, 최종 소비자 소매시장에서 판매되는 가격을 비교 분석할 것이다. 결과적으로 어느 유통단계에 문제가 있으며 어느 부분을 개선해야 하는지 도출할 것이다.

이어서 이 분석을 토대로 기존 농산물 유통 구조의 근본적인 문제점을 해결하기 위한 '온라인 플랫폼'을 활용한 새로운 유통 모델을 제시할 것이다. 온라인 플랫폼이 활성화되기 위해선 두가지 조건이 충족되어야 한다. 플랫폼에서 제품을 공급하는 '생산자'와 온라인 시장에서 제품을 판매하는 '소매업자'가 참여하고 서로 연결되어야 한다는 것이 바로 그 조건이다. 이를 통해 생산자 관점에서는 '스마트팜' 도입을 통한 공급 안정화와 자동화에 초점을 맞출 것이며 유통 관점에서는 유통마진을 최소화 하는데 집중할 것이다. 결과적으로 농산물 유통마진이 최적화되고 소비자들이 정당하고 합리적인 가격에 우수한 품질의 농산물을 구매할 수 있는 플랫폼 비즈니스 모델을 제시하는 것이 본 연구의 궁극적인 목표이다.

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I. Introduction

1. The Problem with Distribution Structure of Agricultural Products

Currently, most agricultural products distribution in Korea is based on "auction " and "wholesale system." The auction transaction method was introduced in earnest in Korea when the ‘Agricultural and Fishery Products Distribution and Price Stabilization Act’ (hereinafter, Agricultural Safety Act) was enacted in 1976. In addition, farmers who have been frequently unilaterally selling products to consignment vendors have been guaranteed transparency and fairness through the introduction of this auction system. In other words, this system contributed considerably to the growth of the Korean agricultural product distribution market.

It's not just auction transaction. Due to its nature, agricultural products have a very short expiration date and are produced only in season, so it is a very important to distribute them in large quantities through wholesale corporations and retail sellers nationwide in a short period of time. It means that wholesale corporations play a very important role in the distribution of agricultural products since it is impossible for farmers to directly engage in distribution and sales.

However, the wholesale-oriented auction system, initiated with a good purpose, is gradually losing their net function as distribution and logistics costs such as store costs and delivery costs increase, and the fluctuation of the winning bid price is deteriorating. In the case of the auction market, the key function that determines the "standard price" has become ambiguous causing rising distribution costs and the price of agricultural products, and consequently consumers took all the burden. The state revised the Agricultural Safety Act in 2012 to reorganize this structure, but wholesale corporations are already making sufficient profits through the auction system; hence, the effect is somewhat lukewarm and is not regarded as a complete alternative to the auction-based market.

2. The Rapid Growth of Online Shopping Market

The online market is growing exponentially. The online shopping market, which had an annual transaction of about 91 trillion won in 2017, accelerated rapidly with the COVID crisis and recorded an annual transaction of 161 trillion won in 2020. There are many reasons why the online market is growing so exponentially. First of all, the emergence of diverse platform services is the key factor. Based on huge capital such as Naver and Coupang, IT companies have entered the lucrative online shopping platform market, making it more convenient for consumers to purchase products, and as a result, consumers are naturally moving their purchasing channels from

offline to online. Second, financial companies have also introduced a simple one-touch payment method in online payments which is different from the public authentication method, rendering the payment simpler and easier. Further to this software environment, the development and dissemination of smartphone devices have made consumers can participate in online shopping actively. Thus, the recent rapid growth of the online market was facilitated by various technical environments, meaning all synergy was aggregated to achieve explosive growth recently.

3. Research Motivation

It is possible to feel motivation from the two stories above: “Wouldn't it be possible to turn it into a much more innovative and efficient market if an online platform was applied to the existing agricultural product distribution industry to replace the auction market?”. In fact, in the field of industrial products, China's Alibaba made such innovative attempts and caused a major transformation in the market. Alibaba broke away from the existing "manufacturing-wholesale-retail" structure and used an online platform to connect manufacturing plants and retailers/consumers directly without intermediate wholesalers, creating tremendous efficiency and added value. The starting point of this proposal is the question of whether agricultural products will also be able to innovate current distribution system by connecting producers and retailers with an Alibaba-like platform business model.

II. Literature Survey and Data Analysis

1. Literature Survey

As a result of surveying 21 related papers related to agricultural product distribution, the topics of these papers can be classified into three major topics: ‘distribution margin and price analysis’, ‘distribution inefficiency’, and ‘the Fourth Industrial technology application’, and details of each can be summarized as follows.

First of all, the agricultural product distribution margin is inefficiently structured. In particular, according to Kim Tae-hoon and Ahn Byung-il (2010), agricultural products have asymmetry in which producer prices and consumer prices rise/fall ranges are different; this means that intermediate wholesalers have considerable market power in the agricultural distribution market. This is because when consumer prices fall, goods are purchased from producers at such a low price, yet on the contrary, when consumer prices rise, they are purchasing them from

producers at the existing price. Moreover, according to a study by Bae Sang-won (2001) and Kim Yoon-doo (2012), agricultural products have an average margin of 41.4%, resulting in a large gap between producer prices and final consumer prices when it experiences various distribution stages.

Therefore, analysis and proposals were derived through diverse studies to improve this inefficiency. According to Kim Kyu-hyung and Lee Moon-seok (2011), the ‘Agricultural and Fishery Products Distribution Corporation’ should actively support direct transactions between production sites and consumers. In addition, in a study by Kim Byung-ryul (2015), direct agricultural transactions are being activated, and 94% of all online agricultural direct transactions are B2C. And in order to make these direct transactions more effective, Ahn Tae-young and Kim Chang-gon (2010) emphasize ‘Branding local agricultural products’ and ‘Active marketing’ through strict quality management. Furthermore, Park Ki-hyung and Kim Ki-beom (2017) developed an 'Online Auction System' that acts as a wholesale market and conducted a successful test corroborating the possibility of replacing the offline wholesale market through online auction.

However, although in the case of direct transactions, there are positive effects of improving distribution functions, there is a study from Kim Byung-ryul and six others (2015) pointing out that insufficient conditions lead to greater inefficiency in the direct transactions. To add, there are several studies concerning the problem of "smallness of distribution in production areas" other than direct transactions. Kim Byung-ryul and three others (2016) argue that a specialized regional agricultural product distribution association is needed because current local agricultural cooperative is very small. Joo Jae-chang (2010) also asserted that efficient organization of production areas is essential in improving the distribution structure of agricultural products, while Du Jeong-wan (2020) also emphasized the role of local agricultural cooperatives and argued that a joint distribution center should be established in production.

In contrast, some argued that the wholesale market should be further reinforced. Kim Jae-min and Park Hyun-wook (2018) emphasized the efficiency of the wholesale market and said that the authority of wholesale corporations should be actively expanded. They also said that distribution costs can be decreased, and efficiency can be increased by expanding the wholesale market as agricultural products are dispersed, and each production area is small. In other words, the wholesale market is an essential factor unless the production area is large-scale.

Finally, with the recent development of ICT technology, many studies reviewed the improvement of distribution problems through the convergence of agricultural products and quaternary industrial technology. Firstly, the representative one is the 'e-commerce' field. In the case of traditional agricultural e-commerce, farmers became managers, operated websites, and sold their products directly to consumers (Park Sung-hee and four others, 2013). But only some farmers were able to sell them and they were less successful due to a lack of understanding of e-commerce. However, about 10 years later, e-commerce has become more common, and Kim Dong-hwan (2020) warned if the National Agricultural Cooperative Federation (Nong-Hyup), production site, wholesale market, and retail market do not adapt to the online system, they will fall behind.

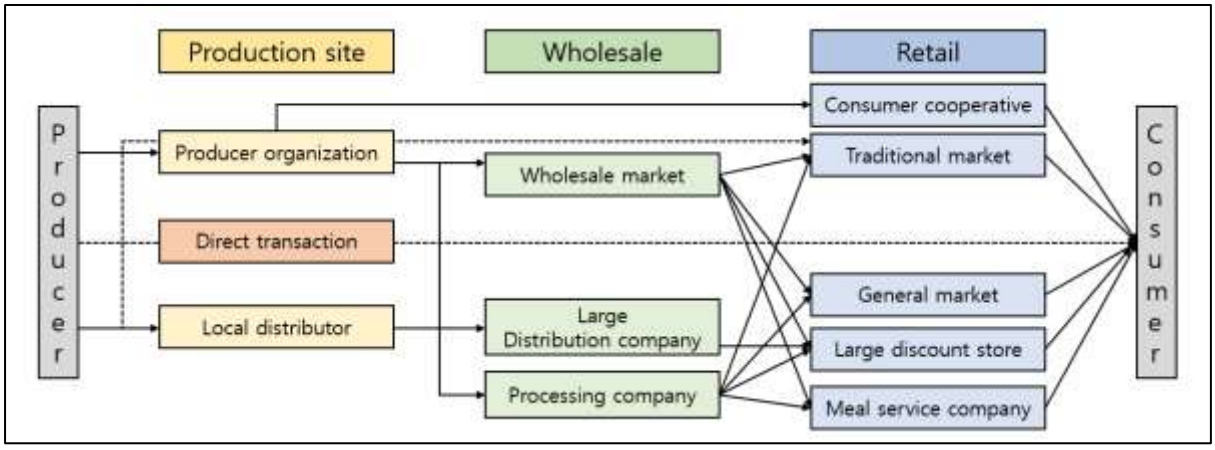
In addition, the number of cases of applying AI, IoT and Big Data technologies to agriculture is augmenting, with large retailers also entering this competition. In the case of Wal-Mart, it has developed an agricultural product

quality management system called ‘Eden’ to standardize the quality of agricultural products and realize smart distribution (Choi Jung-hee, 2021). Furthermore, research substantiates that agricultural product’s condition in the refrigerator will be automatically analyzed in combination with artificial intelligence and the Internet of Things (IoT). This will then be automatically sent to distributors or production sites by cloud data systems so that they can automatically supply agricultural products to consumers without restriction of time and space. (Kim Mi-ok, 2021)

2. Analysis of Current Business Environment

Prior to the proposal, it is necessary to familiarize with the formulation of the current distribution structure of domestic agricultural products.

Figure 1. The Structure of Korean Agricultural Distribution

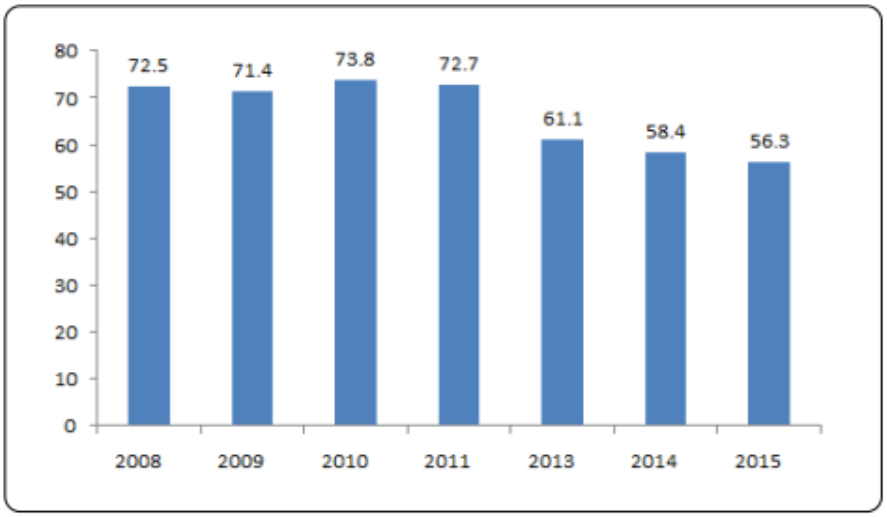


Source: Kim Byung-ryul and three others, Comparative analysis of the agricultural product distribution system and the improvement of distribution policy, 2016 (Reorganized by Kim Tae-hoon)

The distribution of agricultural products in Korea has a distribution structure centered on production area organizations, wholesale markets, and large distributors (Figure 1). In the case of production area organization, agricultural products of each farmer are often simply collected and shipped to the wholesale market, thereby rendering its practical functionality as a cooperative weak. Therefore, it can be said that the Korean agricultural product market is actually dominated by wholesale markets and large distributors. As a result, producers in the production area have relatively low bargaining power, and prices are also greatly influenced by large intermediate wholesalers.

In particular, as public wholesale markets were opened sequentially in major cities across the country until 2004, since the Garak-dong wholesale market was established in 1985, the proportion of public wholesale markets in distribution rose to 73.4% in 2010 (Figure 2). Since then, the proportion of public wholesale markets have gradually decreased as large retailers began to directly procure agricultural products from the production area without going through the wholesale market. Yet the wholesale market still occupies an important position in the distribution chain.

Figure 2. The M/S of the Domestic Agricultural(fruit) Wholesale Market



Source: Korea Agro-Fisheries Distribution Corporation, the distribution status of major agricultural products, 2008-2015 (Data for each year were collected by Korea Rural Economic Research Institute.)

3. Analysis of Agricultural Product Data

As discussed above, it is necessary to accurately analyze the price of agricultural products by distribution stages in a market environment where wholesale distributors have a high price determination power. This is because it is possible to determine the direction of which distribution stage is problematic and how to devise a business model when the price analysis is preceded. Therefore, the following criteria were set to conduct the analysis. (Table 1)

Table 1. Organizing the Criteria for Analyzing Agricultural Data.

Period	26 Sep, 2019
Data Range	Price data of food crops, vegetables, special crops, and fruits distributed in Korea. In the case of the production price, the average price based on the "Garak Market" and the prince of daily largest transaction.
Data processing	Unified the standard price of high quality product Unified the weight unit.
Data source	Agricultural product distribution information system (KAMIS)
Analysis technique.	Used Tableau tool, step-by-step price data comparison, and Gap Margin analysis.

***Source*:** Produced by Kim Tae-hoon (the author), 2022

The price data in the KAMIS system is divided into four categories: Fruit, Crop, Vegetable, and Mushroom. Each category consists of several products. In order to accurately compare the prices of all these products, the exact date on which all price data exists had to be set. This is because there was a lack of data consistency; for example, on certain days, only wholesale and retail prices existed and there was no production price. Hence, the final date selected was September 26, 2019, when all data were consistently present. Based on this date, confirmed data of "production price, wholesale price, and retail price" were collected and reorganized as follows. (Table 2)

Table 2. Data List to be Analyzed

Category	Product
Fruit	Apple (HongRo), Pear (SinGo), Grape (Cambell), Grape (MBA), Shine musket, Pineapple(imported)
Crops	Chestnut Sweet Potato, Potato (Sumi)
Vegetable	Highland Cabbage, Cabbage, Red Lettuce, Blue Lettuce, Watermelon, Cucumber (thorn), Cucumber (Dadagi), Cucumber (ChuiChung), Korean Zucchini, Zucchini, Tomato, Highland Radish, Carrot, Mini Radish (Yul-Mu), Fire-dried Chili Pepper, Sun-dried Chili Pepper, Green Chili Pepper, Ground cherry chili, Chili Pepper (ChungYang), Red Chili Pepper, Onion, Green Onion, Scallion, Ginger, Water Parsley, Sesame Leaf, Green Bell Pepper, Paprika, Peeled Garlic
Mushroom	Oyster Mushroom, King Oyster Mushroom

***Source*:** KAMIS data, analyzed and produced by Kim Tae-hoon (the author), 2022

For the finally selected products, the prices for all distribution stages were summarized as follows (Table 3). The important thing in this data set is that the weight units of the price are all different because the survey criteria and locations were different for each distribution stage. For example, in the case of the Campbell Grape, origin price and wholesale price were surveyed in units of 5kg, while retail price was surveyed in units of 1kg. It is because most of the products are distributed in boxes in the production and wholesale stages, but are sold in small quantities in the retail market.

Therefore, for accurate comparative analysis, the weight unit for each step into 'per Kg' was unified. Prices for each distribution stage were converted into 1kg units so that accurate margin analysis was possible.

Table 3. Price Summary Table for Each Stage of Distribution of Agricultural Products. (as of 26 Sep 2019)[1]

Class	Item	Unit(a)	Origin Price(a)	Unit(b)	Wholsale Price(b)	Unit(c)	Retail Price©	a(per Kg)	b(per Kg)	c(per Kg)
Fruit	Apple (HongRo)	10kg	8500	10kg	27000	10ea(3kg)	19392	850	2,700	6,464
Fruit	Pear (SinGo)	15kg	20000	15kg	32400	10ea(6kg)	34763	1,333	2,160	5,794
Fruit	Grape (Cambell)	5kg	7000	5kg	16000	1kg	4847	1,400	3,200	4,847
Fruit	Grape (MBA)	5kg	9225	5kg	16400	1kg	4410	1,845	3,280	4,410
Fruit	Shine musket	2kg	11000	2kg	28600	2kg	37677	5,500	14,300	18,839
Fruit	Pineapple(imported)	12kg	16000	12kg	30000	1ea(1kg)	5967	1,333	2,500	5,967
Crops	Chestnut Sweet Potato	10kg	12375	10kg	28400	1kg	4818	1,238	2,840	4,818
Crops	Potato (Sumi)	20kg	2000	20kg	21400	100g	217	100	1,070	2,170
Vegetable	Highland Cabbage	10kg	11250	10kg	18400	1ea(2kg)	6641	1,125	1,840	3,321
Vegetable	Cabbage	10kg	1886	8kg	4400	1ea(1kg)	2747	189	550	2,747
Vegetable	Red Lettuce	2kg	8000	4kg	35400	100g	1585	4,000	8,850	15,850
Vegetable	Blue Lettuce	4kg	29000	4kg	34200	100g	1582	7,250	8,550	15,820
Vegetable	Cabbage	1kg	1000	4kg	9800	1kg	3056	1,000	2,450	3,056
Vegetable	Watermelon	12kg	5300	12kg	30400	6kg	18385	442	2,533	3,064
Vegetable	Cucumber (thorn)	10kg	14782	10kg	22000	10ea(2kg)	9250	1,478	2,200	4,625
Vegetable	Cucumber (Dadagi)	21kg	36786	21kg	59333	10ea(2kg)	9119	1,752	2,825	4,560
Vegetable	Cucumber (ChuiChung)	10kg	13800	10kg	40000	10ea(2kg)	12382	1,380	4,000	6,191
Vegetable	Korean Zucchini	8kg	11639	8kg	23800	1ea(300g)	1685	1,455	2,975	5,617
Vegetable	Zucchini	10kg	10500	10kg	27000	1ea(300g)	1852	1,050	2,700	6,173
Vegetable	Tomato	10kg	19178	10kg	30200	1kg	4525	1,918	3,020	4,525
Vegetable	Highland Radish	20kg	7800	20kg	13800	1ea(800g)	2026	390	690	2,533
Vegetable	Carrot	20kg	11000	20kg	37600	1kg	3348	550	1,880	3,348
Vegetable	Mini Radish(Yul-Mu)	4kg	3800	4kg	9000	1kg	2925	950	2,250	2,925
Vegetable	Fire-dried Chili Pepper	30kg	292625	30kg	470000	600g	13126	9,754	15,667	21,877
Vegetable	Sun-dried Chili Pepper	30kg	335000	30kg	600000	600g	15443	11,167	20,000	25,738
Vegetable	Green Chili Pepper	10kg	4000	10kg	57800	100g	1158	400	5,780	11,580
Vegetable	Ground cherry chili	4kg	14000	4kg	35400	100g	1524	3,500	8,850	15,240
Vegetable	Chili Pepper(ChungYang)	10kg	20263	10kg	40200	100g	1006	2,026	4,020	10,060
Vegetable	Red Chili Pepper	10kg	16800	10kg	48000	100g	1265	1,680	4,800	12,650
Vegetable	Onion	20kg	6000	20kg	10300	1kg	1309	300	515	1,309
Vegetable	Green Onion	1kg	1593	1kg	2080	1kg	3202	1,593	2,080	3,202
Vegetable	Scallion	1kg	750	1kg	4300	1kg	6192	750	4,300	6,192
Vegetable	Ginger	20kg	70000	20kg	148000	1kg	18803	3,500	7,400	18,803
Vegetable	Water Parsley	15kg	37500	15kg	63000	100g	794	2,500	4,200	7,940
Vegetable	Sesame Leaf	2kg	21750	2kg	33200	100g	2249	10,875	16,600	22,490
Vegetable	Green Bell Pepper	10kg	15000	10kg	57800	100g	1549	1,500	5,780	15,490
Vegetable	Paprika	5kg	20500	5kg	29800	200g	2017	4,100	5,960	10,085
Vegetable	Peeled Garlic	20kg	46000	20kg	76200	1kg	7067	2,300	3,810	7,067
Mushroom	Oyster Mushroom	2kg	4650	2kg	15400	100g	1042	2,325	7,700	10,420
Mushroom	King Oyster Mushroom	2kg	6500	2kg	8200	100g	537	3,250	4,100	5,370

Source: KAMIS data, analyzed and produced by Kim Tae-hoon (the author), 2022

[1] For each step, every weight counting criteria(kg) is different, so each price is converted into 'per kg' unit on the right for analysis

As a result of the analysis applying such process, it was found that the wholesale price had an average margin of 2.8 times of the production price, and the retail price had an average margin of 1.94 times of the wholesale price (Table 4). Comparing the final retail price with the production price, an average margin of 5.5 times was discovered.

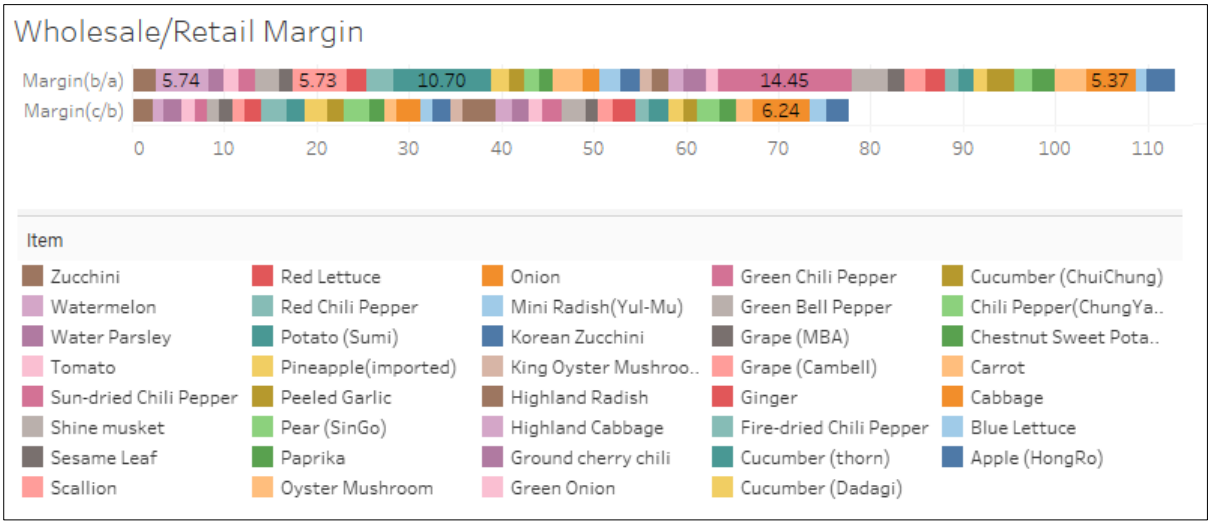
Table 4. Margin Differences between Production/Wholesale/Retail

Category	Margin (Wholesale/Production)	Margin (Retail/Wholesale)
Crops	6.5	1.9
Fruit	2.2	1.9
Mushroom	2.3	1.3
Vegetable	2.7	2.0
Total	**2.8**	**1.9**

***Source*:** KAMIS data, analyzed and produced by Kim Tae-hoon (the author), 2022

For example, in the case of cabbage, it is shipped to wholesalers at 1,000 won per kilogram from the production area, but wholesalers sell it to retailers at 2,450 won per kilogram. In addition, retailers sell it to final consumers for 3,056 won per kilogram. What is noteworthy here is that, the gap in wholesale-producing areas is about 90% more than the gap in retail-wholesale, and considerable costs are incurred in the wholesale distribution stage of agricultural products. (Figure 3)

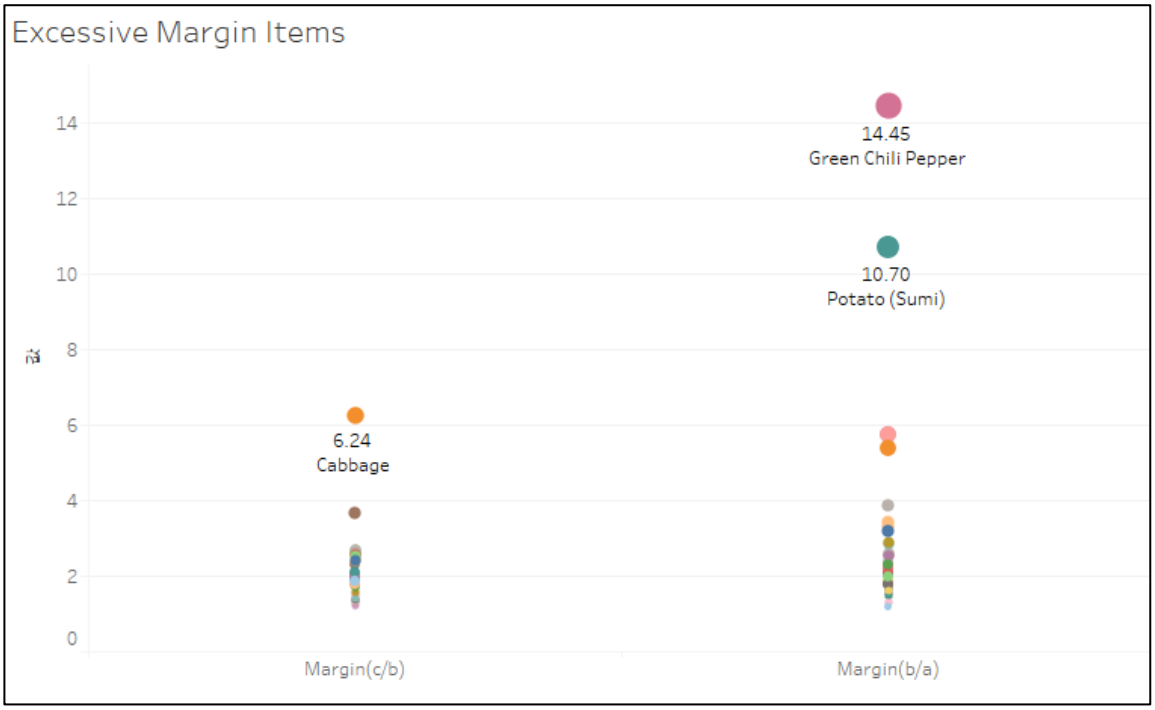
Figure 3. Comparative Analysis of Margin Gap between Retail/Wholesale/Production price
(a = Production price, b = Wholesale price, c = Retail price)



Source: KAMIS data, analyzed and produced by Kim Tae-hoon (the author), 2022

Moreover, one peculiar aspect is that there is a huge margin gap in some products (Figure 4). In the case of green bell peppers, the wholesale price was 14.45 times higher than the production price, and the potato (Sumi) was 10.7 times higher. Scallion was followed by 5.73 times. This means that prices rise sharply in the distribution process of agricultural products through wholesale markets in the production area, and even irrational margins are formed for some items.

Figure 4. Analysis of Items with Excessive Margin.
(a = Production price, b = Wholesale price, c = Retail price)



Source: KAMIS data, analyzed and produced by Kim Tae-hoon (the author), 2022

4. Implications of Data Analysis

To sum up the above analysis results, agricultural products are experiencing greater price increases and inefficiencies in "wholesale" compared to "retail," at 1.9 times the average increase in retail. Therefore, from these results, it is possible to set the direction of a new business model that focuses more on innovation in the 'wholesale' stage rather than 'retail' in innovation in the distribution structure of agricultural products. Furthermore, the tool of innovation will be set up online rather than offline. This is because, aforementioned, in offline distribution, excessive margins increase due to various storage or facility fees and incidental costs.

In order to improve the inefficiency of the current offline wholesale market, "online brokerage transaction platform" that acts as a kind of offline wholesale market can be suggested, and such platform business service can broker production producers directly with the retailers. In other words, the aim is to ultimately establish an "Alibaba" in the agricultural industry. The reason Alibaba was able to be innovative was that the platform successfully replaced the functions of the existing "wholesale market" and directly connected factories and retailers. By doing so, considerable prices and process innovation could be achieved.

Likewise, the business model that will be proposed is a different concept from the existing 'direct transaction'. Direct transaction is a concept of connecting 'producers' and 'consumers'. However, in this new business model, it connects 'producers' and 'retailers'. The reasons for connecting producers and retailers are as follows. First of all, as the platform replaces the wholesale brokerage trading function between producers and retailers, it is possible to switch online without significantly altering the existing distribution structure. In addition, it can overcome the weakness of ‘direct transaction’. In direct transaction model, producers are not utilized when selling their item to consumers, but in the new platform model, all the producers have to do is just producing and delivering because retailers sell their products online on behalf of them. As a result, overall distribution quality can improve while allowing retailers specialized in sales and producers specialized in production to focus on each of their professional field.

According to this idea, the new business platform model will be proposed in the following having reviewed various aspects, implementation plans, and limitations.

III. Research on Cases

The core concept to be presented through this Proposal is innovation through 'the reduction of the agricultural product distribution stage'. Therefore, it is necessary to examine the cases of actual distribution innovation through online platforms in diverse distribution industries and examine if there are any factors that can be applied to this business proposal. Thus, three cases were selected, ‘Alibaba’, ‘Farm Morning’, and ‘JeongYookGak’, which have achieved distribution innovation in "Industrial products," "Agricultural products" and "Livestock products" respectively.

1. Industrial Product Distribution Innovation of ‘Alibaba’

Alibaba is China's largest e-commerce company, accounting for more than 80% of China's e-commerce market. 70% of parcel packages in China are products related to Alibaba, and commerce through Alibaba accounts for 3% of China's GDP (Gross Domestic Product). Alibaba is operating a variety of businesses, including B2B services, online payments, mobile operating systems, and cloud computing, as well as e-commerce. And the representative business of them would be e-commerce. (Kim Chang-bong and two others, 2019)

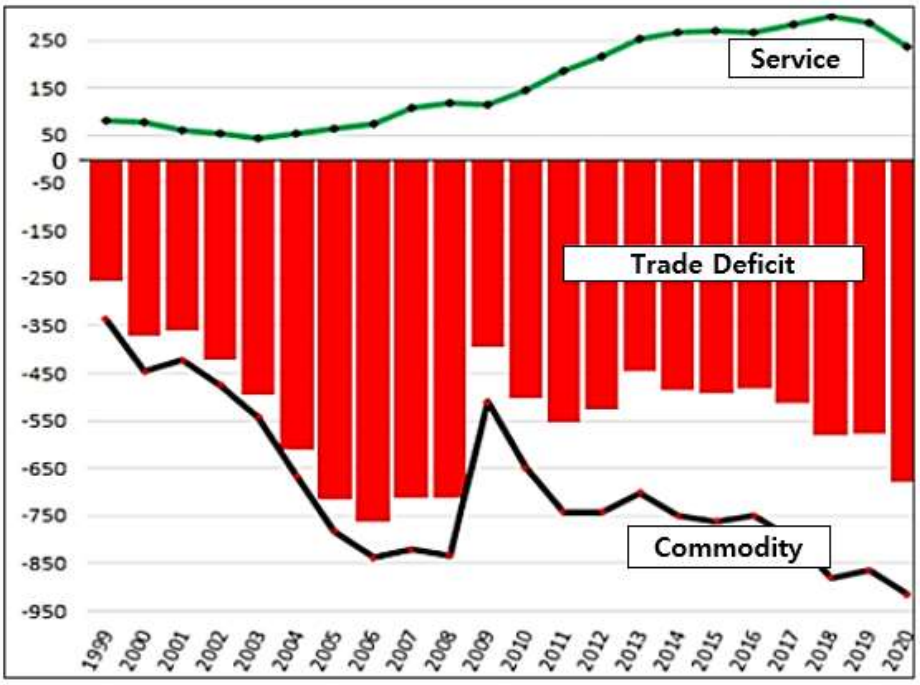
The core competency of Alibaba is that it is an "Open Platform." In other words, it is an online market that connects and provides buyers and sellers with online trading opportunities and information sharing services and receives brokerage fees. Through this open platform structure, Alibaba served itself as a huge wholesale market and it enabled direct distribution from Chinese factories to overseas retail sellers without any complex distribution stages and exporters. Consequently, it innovated the distribution stages from existing ‘manufacturing-wholesale/export-retail’ to "manufacturing-retail."

Figure 5. The Proportion of Alibaba Group by Country of Overseas Sales (2015)

Source: Tmall Global, Aliresearch analysis, 2015

Among Alibaba's major overseas sales countries, USA accounts for an overwhelming proportion (Figure 5), which means retail sellers of the two largest e-commerce platforms Amazon and eBay import most of their products from Alibaba and sell them in USA. Figure 6 demonstrates this fact and it can be seen that USA's commodity import is gradually increasing.

Figure 6. The Status of the U.S. Trade Balance (2020, Unit: $1 billion)



Source: Samuel Lee (KOTRA Washington), Wolfstreet, 2020

In addition, Table 5 shows that China accounts for a very large proportion of this increase in U.S. imports. It means that Alibaba, a representative platform for exporting Chinese commodities, has a considerable influence on the global trade market especially in USA. This phenomenon is accelerating further, and the representative example is China's Gwanggun festival.[2] Due to the prevalence of global online distribution and as Chinese influence grows, Alibaba and China's second-largest online commerce platform Jingdong.com reached a daily sales record high of 164 trillion won in November 2021 (Lee Bul-chan, 2021).

[2] The Gwanggun Festival began in 2009 and is China's largest online discount event held annually on November 11.

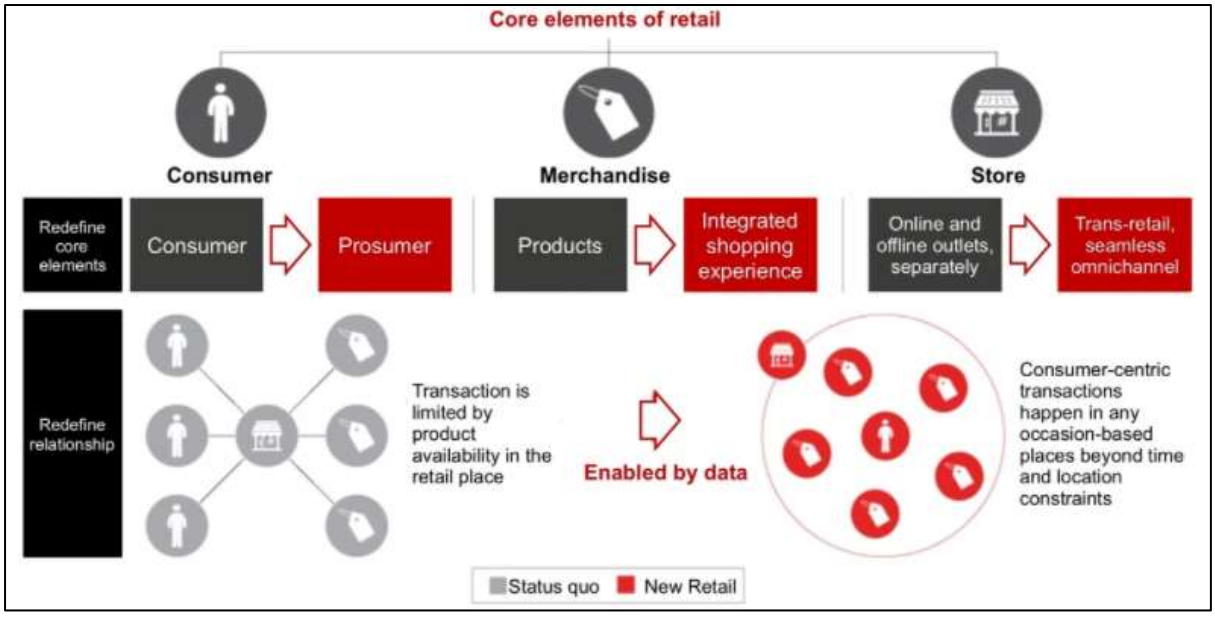
Table 5. Top 5 Countries of U.S. Trade Deficit (2020, Unit: $1 million)

Country	Export	Import	Trade Balance
China	124,648	435,449	-310,801
Mexico	212,671	325,394	-112,723
Vietnam	9,989	79,645	-69,656
Germany	57,795	115,120	-57,325
Switzerland	18,044	74,782	-56,738

Source: Samuel Lee (KOTRA Washington), US Bureau of Economic Analysis (BEA), 2020 (Reorganized by Kim Tae-hoon)

As such, Alibaba is changing the landscape of the global trade market as China's No.1 online distribution platform. At the Ali Cloud Developers Conference held in Hangzhou in October 2016, Alibaba's Chairman Jack Ma mentioned the concept of 'New Retail' for the first time. The term 'New Retail' is a consumer experience-oriented data-based distribution concept, which combines artificial intelligence, Internet of Things (IoT), and data of users and products to improve operational efficiency and accumulate customer experience (Oh Jong-hyuk, 2018). Alibaba recently accumulated a huge ecosystem by integrating various IT technologies as fintech, logistics networks, and big data with its "open platform" business model according to this concept. (Figure 7)

Figure 7. Concept of Alibaba's 'New Retail'



Source: Bain Analysis, 2017

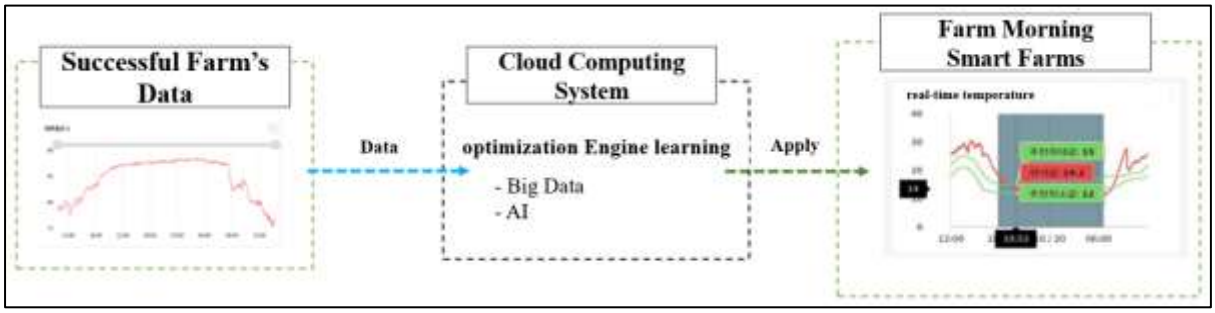
2. Agricultural Product Distribution Innovation of ‘Farm Morning’

The second case is a Korean platform called ‘Farm Morning”. It is also very closely related to the theme of this proposal as it introduces smart farms to farmers and aids them in selling their products more conveniently. In addition, the company is genuinely striving to innovate the distribution structure of agricultural products in multiple ways. Hence, it is necessary to closely understand and move on to Farm Morning's business model prior to the proposal.

Farm Morning is a platform operated by a start-up called ‘Green Labs’. This company’s mission is ‘One-stop data solutions for farm management from production to distribution’ and its strategic goal is ‘Leading the digital innovation of Korean agriculture’. As can be seen from the missions and goals, Farm Morning’s core competencies are ‘digital’ and ‘data’ and its various business models are being built based on them. In addition, in recognition of the value of the business model from VC investors, it attracted a large investment of 20 billion won from Hashed, Magna Investment, and Main Street Investment (eBEST, 2021).

Farm Morning business model's fundamental direction is ‘agricultural innovation’. It provides diverse data such as weather, pests, and fertilizers to farmers and supports their production activities by operating a farming community. Furthermore, it also provides farmers with a smart farm solution service that allows them to install IoT hardware on their farms and monitor and automatically control the farm's environment. Moreover, it stores various data collected from successful smart farm in cloud servers and develop them with artificial intelligence and machine learning, providing all-round support so that novice farmers can build the same environment as successful ones (Figure 8). In addition, the distribution price of agricultural products data is analyzed and is provided to the farmers so that they can participate in the distribution and sell their agricultural products much more easily.

Figure 8. Smart Farm Support Strategy of Farm Morning



Source: Agriculture's Path (Seminar), 2021

With the successful introduction of the business, Green Labs recently established a new distribution platform called ‘Fresh Market’. It is a platform focused on sellers and distribution/sales side while Farm Morning is focusing on farmers and production side. Fresh Market is a platform for professional online sellers to promote the sale of agricultural products produced by Farm Morning's farmers. Here, sellers are provided with information on agricultural products grown by farmers and get sales authority, and when an order comes in, order information is sent directly from the sellers to the farmers. Consequently, products are shipped from the production area directly to customers who placed orders. It has only been a year since launching, and as of 2021, it has attracted 10,000 online seller members and achieved annual sales of 100 billion won.

When going to the website of ‘Fresh Market’(sinsunhi.com), sellers are being recruited for various agricultural product categories. And here, it emphasizes the 'low price' than the wholesale market price and the 'freshness' of direct delivery from the farmers to the customers. Actually, In the price table of the main page, it can be seen that products are supplied to the sellers at about 45% to 75% of the offline wholesale price.(Table 6) It means Farm Morning's price competitiveness is far superior to offline, and many opportunities can arise from this point.

Table 6. Price Table(per kg) of Farm Morning’s Fresh Market(Sinhunhi.com)

Product	Wholsale Market Price(a)	Platform Price(b)	b/a
Radish	447	200	45%
Sweet Potato	2,000	1,200	60%
Apple	2,700	2,000	74%
Garlic	7,800	5,500	71%
Lettuce	1,700	1,000	59%
Onion	380	230	61%

Source: https://sinsunhi.com/service_landing

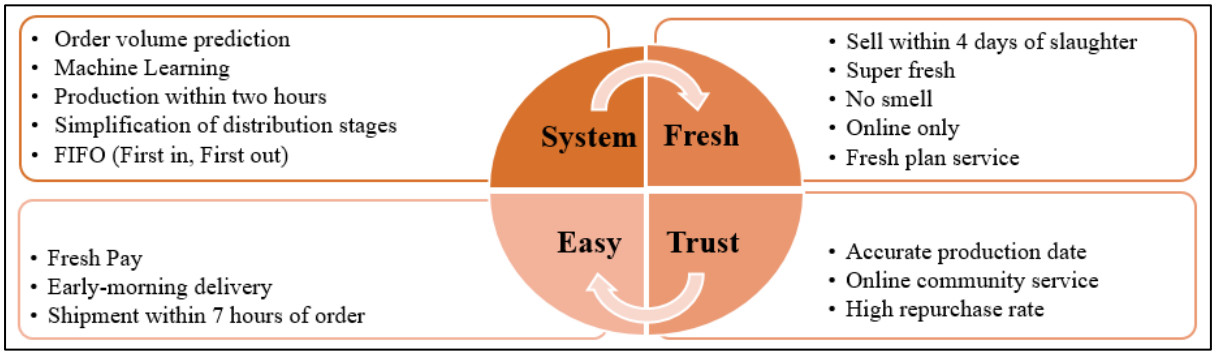
3. Livestock Product Distribution Innovation of ‘JeongYookGak’

JeongYookGak is an online platform specialized in the distribution of livestock products in Korea that launched in 2016 and achieved 16.2 billion won in sales in 2020. The core competency of this business is ‘Super Fresh’. JeongYookGak selects all farms on its own after careful examination and evaluation so that it could build the best livestock farmhouse vendor chain. Furthermore, all meat is sold within four days after slaughter, so all products of the JeongYookGak have the keyword ‘Super Fresh’ attached in front of its name. To make thus

possible, various IT solutions regarding production and distribution management such as order volume prediction system, machine learning, and first-in-first-out management system were developed.

The business model of JeongYookGak can be summarized as below from its four core values of 'System', 'Fresh', 'Easy', and 'Trust' (Figure 9).

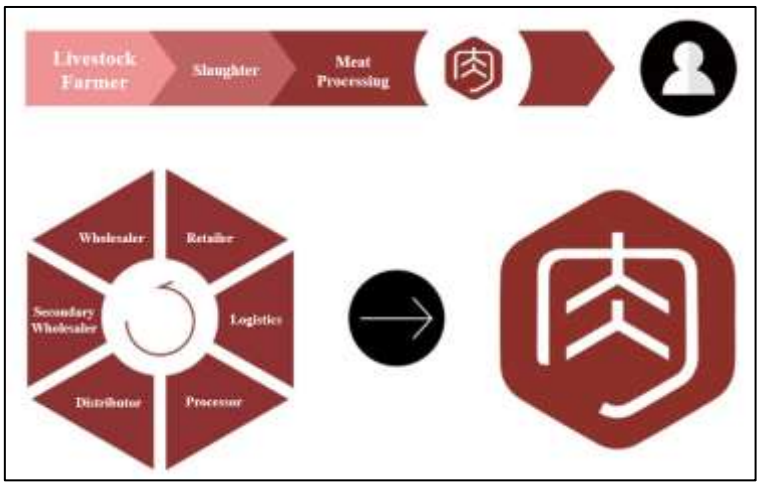
Figure 9. Four Major Value Proposition Solutions of JeongYook Gak



Source: Produced by Kim Tae-hoon (the author) by referring JeongYookGak brand report, 2020

And through all of the factors above, overall livestock distribution innovation could be achieved as shown in Figure 10. Various distribution stages such as Wholesaler, Secondary Wholesaler, Retailer, Logistics, Meat Processor and Distributor were integrated on the platform. And as a result, these distribution innovations made it possible to distribute fresh meat to consumers at reasonable prices, resulting in increased consumer satisfaction.

Figure 10. Distribution Innovation Concept of Jeong Yook Gak



Source: How did Jeong Yook Gak succeed?, Park Yo-Chul, 2020

Furthurmore, JeongYookGak also focused all systems and services on the customer satisfaction, and even small parts such as product packaging uses a technique that minimizes oxygen contact. It costs more than former packaging, however, 'eating more deliciously' is more important for JeongYookGak than 'just looking good'. Besides, various efforts are being made to increase product freshness, such as the self-development of cooling packs. Recently, in recognition of its value, JeongYookGak attracted 10billion won investment from Naver, the largest IT company in Korea, in 2021. And in 2022, it decided to acquire 'Green Village', Korea's top organic agricultural distributor, for 90 billion won, further striving to expand its business scope from existing livestock products to agricultural products.

4. Comparative Summary and Suggestion

To summarize, three business models above can be compared and organized as below (Table 7).

Table 7. Comparative Summary of 'Alibaba', 'FarmMorning' and 'JeongYookGak'

	Alibaba	FarmMorning	JeongYookGak
Main Item	Industrial products	Agricultural products	Livestock products
Starting year	1999	2017	2016
Business Type	Online Distribution Platform		
Business Models	· B2B Open market · B2C Open market · Logistics · Fintech(Payment) · Insurance · Big Data	· Data solution · Smart farm · B2B Open platform · Distribution	· B2C Open platform · Distribution · SCM (Supply Chain Management)
Core Competency	Open Platform (from Factory to Retailer)	Distribution Chain (from Farmer to Retailer)	Super Fresh (from Farmer to Customer)

Source: Produced by Kim Tae-hoon (the author)

Through all the cases above, it is necessary to explore what can be applied to this business model and what can be improved with new ideas. First of all, Alibaba is very meaningful in that it is almost the first online platform to replace the wholesale market. In addition, another biggest strength of Alibaba is that it has created huge distribution synergy by expanding its business to Logistics, Fintech, and Insurance, etc. On one hand, there is a possibility that such aggressive business expansion could pose a risk that could drive the business into a big crisis.

However, the ability to build an overall distribution ecosystem through integration in various fields is consistent with the direction that the business model should pursue in the long run.

In the case of Farm Morning, there are lots of strong points to learn because it deals with agricultural products same as the business model of this proposal. First, it was a very brilliant choice to attract hundreds of thousands of farmer members in advance to the launching its distribution platform. This is because farmer members are the key factor of agricultural product distribution. Online retailers are relatively easy to recruit, but it is very difficult to recruit farmers who are not familiar with online. Therefore, by successfully completing these steps, Falm Morning has been able to achieve greater business expansion. And it is also necessary to apply this succesful procedure to this proposal.

However, on the other hand, it is questionable whether Farm Morning is currently building an ecosystem that utilizes IT and Big Data with smart farm. When observing the recent promotion and business direction of Falm Morning, it seems to be focusing more on generating profits through distribution platforms rather than building an IT and big data ecosystem. Therefore, after the agricultural product distribution platform is successfully established, it is desirable to build an overall ecosystem by combining various consumer demand data generated from retailer's sales activities and the prduction data of smart farms that Falm Morning has previously distributed to farmers.

Finally, in the case of Jeong Yook Gak, it has a specificity in that the platform has all control over distribution and sales as a form of B2C. In this way, the biggest advantage is 'Margin Maximizing'. This method is also recently adopted by a few large retail platforms such as Coupang. Instead of connecting suppliers and demanders, the platform plays a role as a main control tower to sell their own product directly to consumers and maximize its margin. This method is far from this proposal's concept, but it is worth considering in the long run.

The key point to Jeong Yook Gak is whether the system can handle the exponential growth in retail demand and customer service burden as the platform grows in size. In according to manage this growth, it requires a very delicate distribution system. In a general brokerage transaction platform, it only needs to connect the players. However, when the platform starts to engage in retail activities, many more variables will occur incidentally. Therefore, if Jeong Yook Gak has a solid supply chain and distribution system, engaging a second player who can specialize in marketing and selling its products can also be a good choice for its long-term business growth.

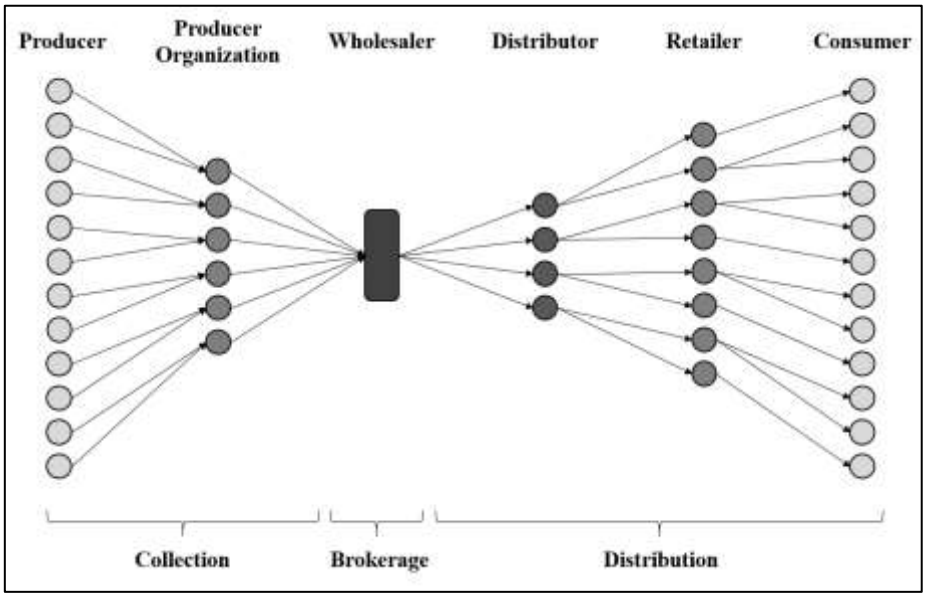
IV. Business Proposal

1. Proposal of New Business Model

In order to solve the fundamental problem of the distribution structure of agricultural products, it is essential to facilitate the distribution stage. As above, there have been many attempts to reduce the distribution stage of agricultural products through the introduction of Direct Transaction and Online Auction System so far, and the government has sought to streamline the distribution structure through various policies. However, it has not been easy to remove or replace the 'wholesale market', which is a key factor of the rise in agricultural distribution costs because it is of key essence in the distribution process. However, in the current situation where online distribution is becoming more prevalent, the possibility of removing wholesale market is gradually emerging. Therefore, this proposal will present a new business model based on such perspective.

A brief summary of the distribution structure of agricultural products so far is as follows (Figure 11). First of all, agricultural products are collected from various distributed production sites through producer organizations in each region. In addition, products nationwide are amassed in the wholesale market, are distributed again to intermediate wholesalers and retailers through the auction system or the contract between each company. Subsequently, these products are finally sold to consumers. In other words, the wholesale market plays a central role for collecting agricultural products produced in large quantities in each region in one place and subdividing and dispersing them as required.

Figure 11. Current Structure of Agricultural Products Distribution



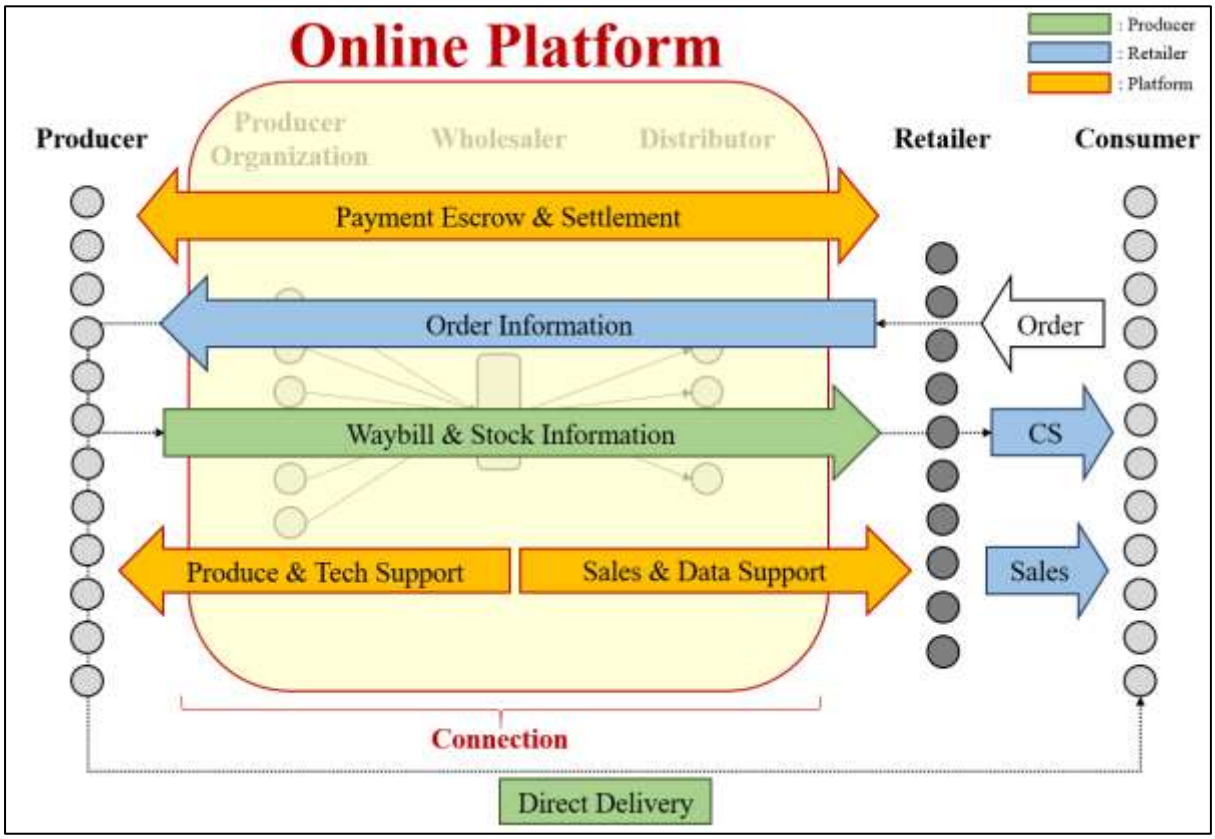
Source**:** *We Tae-seok,* Efficient distribution of agricultural products and problems in stages, 2013 (Reorganized by Kim Tae-hoon)

As the wholesale market plays a key role in the distribution structure of agricultural products, several stages of distribution process inevitably occur around it and it is simultaneously the main reason for rising agricultural prices. Therefore, only when the distribution stage is facilitated, can this price increase problem be fundamentally solved. In addition, in order to reduce unnecessary distribution costs, innovation in the "wholesale market," which is the central axis of this structure, is needed. From this point of view, removing the functionality of offline wholesale markets and replacing them online is the core idea of this proposal.

The representative way to reduce the function of the wholesale market is to directly trade agricultural products. The direct transaction method has the advantage of being flexible and minimizing distribution costs because there is no intermediate distribution process between producers and consumers. However, there are several defects in the direct transaction. First of all, the biggest obstacle is the producer's lack of sales capabilities. In the direct trading market, producers must promote their products and even sell to the customers themselves. Some producers with branding capabilities have achieved great success through direct transactions, but for most farmers, direct transactions are a sales method with a low probability of success. The second problem is that direct transactions are usually made in small quantities of B2C sales, so it is difficult to digest the supply of agricultural products produced in large quantities in each season. Due to this supply characteristic of agricultural products, it is much easier for producers to sell them in large quantities to local cooperative organizations or wholesale markets at low prices than to sell them directly to consumers on a small scale.

In other words, if the two problems above, ‘Lack of sales capability’ and ‘Small sales scale focused on B2C’, which are disadvantages of direct transaction methods, can be solved, new value can be created. As shown in the figure 12 below, the existing offline "Collection" and "Distribution" functions disappear in the new business model, and the producers are connected directly to the retailers who are specialized in online sales. And the online platform plays the role of intermediary which is connecting those two players. In other words, the distribution structure is simplified from the existing 'Collection-Brokerage-Distribution' structure to 'Connection' only.

Figure 12. Concept of New Agricultural Product Distribution Model



***Source*:** Produced by Kim Tae-hoon (the author), 2022

Previously, in order to sell agricultural products, offline shopping boards or spaces were needed to display products. However, with the growth of online distribution, the domestic delivery logistics system also grew rapidly thereby making one-day delivery possible on a nationwide scale. Moreover, a market environment was gradually created where products can be delivered to consumers without any offline store. Therefore, farmers can no longer ship grown products directly to customers without selling them to wholesale markets. However, the main obstacle is that they are not professional in online sales. This is why professional online retailers are required to sell agricultural products online, and the platform plays a role in connecting retailers and producers efficiently. If these distribution system function efficiently, it is possible to sell high quality agricultural products to end customers as much as possible at a cheap price merely by connecting sellers and producers online.

For example, Table 8 below compares the margin in current offline distribution structure with the margin of online distribution through platform of tomato. There are two assumptions in this comparison. First is that online price is 10% more expensive than offline because of several transaction fee. Second is that the average price increases by 24% in each stage according to current price in Table 3. As a result, the price of tomatoes, which was 1,918 KRW, rose to 4,525 KRW through the five offline distribution stages, while the price rose only

to 3,244 KRW with the application of the online platform. This is because when using the online system, two distribution stages are eliminated compared to offline.

Table 8. Selling Price Simulation of Tomato 1kg

Stage(Offline)	Price(Offline)	Price(Online)	Stage(Online)
Producer	1,918	2,110	Producer
Regional Organization	2,469	2,616	Platform
Wholesaler	3,020		
Distributor	3,773		
Retailer	4,525	3,244	Retailer
Consumer			Consumer

***Source*:** Produced by Kim Tae-hoon (the author), 2022

2. Development Plan and Estimated Cost

In order to establish a platform with the above concept, various resources should be reviewed and combined well, and cooperation with various partner companies is required. It is expected to take approximately a year to develop from the initial design to the final launch. Therefore, it is necessary to first review what steps are required to proceed with the entire project, what action plans are required, how much time is needed as well as the budget it will take for each step.

The platform development will consist of a total of eight stages: attracting investment, selecting partners, database development, system module design, web page function design, web page development, final test and launch. First of all, it is necessary to plan a business model, explain its expected value to investors, and persuade them to attract investment. If the investment is successfully implemented, it is necessary to select development partners who can cooperate within the budget of the investment and start full-scale development. It is expected to take about three months to prepare this stage.

When all contracts are made with selected partnerships, development begins. Development will consist of four stages. First of all, the most fundamental part of the system, the database, must be formulated. This is because all systems are run based on its database. Therefore, it is necessary to study what functions are needed and what data to select. Defining the relationship between each data should be done as well. And based on this, Relational

Database (RDBMS) will be built and an Extract-Transform-Load (ETL) logic and DB scheduling between each table will be devised. All of these database development processes are not one-time events. It should be carried out in parallel with the entire project development period and continuous updates must be made accordingly whenever the system details change. Therefore, the total development period of Database is estimated as 8 months, which takes the longest time among all projects.

System Module Designing will begin at the same time as database development. All systems will be designed based on Customer Requirements and will take into account the detailed module and functional concept as well as the linkage between each module and how these functions should be reflected on the web should be somewhat designed. When the design of the system module is completed, the development of the web page will begin. Detailed web pages will be conceived, and site maps and storyboards of web pages will also be created. Information Architecture and User Interface (UI) of the web page must also be designed. When all processes are completed, the final development proposal presentation will be held. This system module and web page designing processes are at a 'planning' stage, so it will take about two months each.

After all the planning and designing stages are completed, the menu and each web module will be developed, followed by publishing and detailed code programming. Moreover, a web management system will also be developed to maintain and manage the web after the development. Subsequently the final web page will be formed through Image Application and DB Integration. Finally, an operation test and error fix will take place for about a month, and the development will be finally completed by connecting domain to the web page and registering it with search engine like Google or Naver. This process will take about four months to develop and one month to test and launch.

Considering all these processes and the man-day period required for each stage, it is expected that a total development cost of about $109,110 will be incurred, and the specific details and action plans of each stage are summarized in the following table (Table 9).

Table 9. Action Plan Cascade and Estimated Cost for Platform Development[3]

Project	Duration	Action (Tasks)	1	2	3	4	5	6	7	8	9	10	11	12	M/D	Cost(USD)
Attracting Investment	1-2M	Conceive Business Model													40	1,200
		Business Plan Preparation													46	1,380
		Prospective Investor Contact													48	1,440
		Business Plan Presentation													38	1,140
		Final Investment Decision													46	1,380
Select Partners	1M	Development Scope Confirmation													44	1,320
		Partner Candidate Configuration													38	1,140
		Partner Selection Presentation													46	1,380
		Partners Comparision													44	1,320
		Final Partnership Agreement													42	1,260
Database Development	8M	Core Function Requirement Study													42	1,260
		Data Selection, Relation Configuration													186	5,580
		Relational-based Database Design													214	6,420
		ETL Logic and DB Scheduling Design													218	6,540
		Update Database (New Features)													321	9,630
System Module Design	2M	Customer Requirement Review													66	1,980
		Concrete Module&Function Design													126	3,780
		Intermodular Linkage Setting													72	2,160
		Detailed Function Design													135	4,050
		Webpage Implementation Design													69	2,070
Webpage Design	2M	Webpage Detailing													100	3,000
		SiteMap Configuration													95	2,850
		Web-Design Storyboard Production													115	3,450
		Information Architecture Configuration													115	3,450
		User Interface (UI) Design													100	3,000
		Final Web Development Presentation													105	3,150
Webpage Development	4M	Proposal Review, Layout Composition													115	3,450
		Menu Design													95	2,850
		Web Module Design													110	3,300
		Web Publishing													110	3,300
		Web Programming													200	6,000
		Management System Development													110	3,300
		Image Application													95	2,850
		DB Integration and Final Testing													100	3,000
Final Test & Launching	1M	Temporary Operation Test													46	1,380
		Error Check and Fix													100	3,000
		Domain Connection													22	660
		Search Engine Registration													23	690
Total															**3,637**	**109,110**

***Source*:** Produced by Kim Tae-hoon (the author), 2022

[3] M/D: Man Day

3. Business Entry Strategy

When the platform development is completed, the business entry stage begins. First of all, through the analysis of 3C, SWOT, and 5Forces model, market environmental factors will be examined to see if it is currently appropriate to enter the business. Afterwards, strategies will be established to enter the market initially and to find what points to focus on to promote the platform.

(1) 3C Analysis

First, 3C analysis was conducted to consider if the business is suitable to enter the market (Table 10).

From the Customer's point of view, the size of the domestic online food market is 2.42 trillion won as of August 2021, which augmented approximately 30.8% compared to August 2020 (National Statistical Office, 2021). Therefore, the market maturity can be judged as "Growth Stage" because the domestic online food distribution market is rapidly growing and expanding.

From the point of view of the Competitor, it can be said that the current competition strength is low. This is because "Farm Morning" is the only company currently trying to create an agricultural distribution platform in the domestic online distribution market. Similar to this business proposal, Farm Morning also started out as a 'smart farm' startup and is just expanding its distribution part. Therefore, Farm Morning is perceived as the only competitor in this kind of business. In addition, entry barriers are high because building and designing a platform system requires well-trained expertise, and furthermore, attracting farmers who are not familiar with online requires long time investment and effort. However, even if the barriers to entry are high, if this business model is known to be lucrative, large retailers such as SSG, Coupang, Naver, Lotte could jump into competition by launching similar platforms based on their huge capital power, and that could be considered as a threat to potential competitors.

Lastly, from the Company's perspective, this business model has high conformity with the online distribution company’s vision, and when the agricultural distribution platform is successfully established, the synergy with other businesses will be also high, just like the livestock distribution platform ‘JeongYookGak’ took over the agricultural distribution platform ‘Green Village’. However, the basic initial platform construction cost is expected to be about 109 thousand won, and greater capital is required for future promotion and business expansion. It means that the resources are relatively insufficient, so attracting investment is an important factor.

Table 10. 3C Analysis of the Business Model

3C	Analysis
Customers	● Market Size : 2.42 trillion won (per month) ● Market Growth : 30.8% ● Market Maturity : 'Growth' stage
Competitors	● Competition Intensity : Low ● Existing Competitors : Farm Morning ● Potential Competitors : Major Distiributors(SSG, Coupang, Naver, Lotte) ● Entry Barrier : High
Company	● Vision Conformity : High ● Company Resource : Low (needs investment) ● Synergy with other businesses : High

***Source*:** Produced by Kim Tae-hoon (the author), 2022

(2) SWOT Analysis

Following the 3C Analysis, the strengths and weaknesses of this business, opportunities, and threatening factors was analyzed through SWOT analysis. (Table 11)

First of all, from the point of an internal aspect, this business model possesses a strong strength in terms of 'newness' that it is a business that did not exist before. Rather than competing in a fierce red ocean, it has a great advantage to enter the market by presenting a new business model and pioneer a blue ocean that has not existed before. In addition, due to the nature of the startup business, a company culture that allows flexible communication, recruitment can enable bold implementation of innovative strategies, acting as a strength.

On the contrary, from an external perspective, the great opportunity for this business is that it can apply the First Mover Advantage. Since few companies are yet to launch such a business model in the market, it can have such a ripple effect as a first mover. Furthermore, online sales in the food sector are showing rapid growth and consumers' surging demand for fresh agricultural products is also a positive factor. And ultimately, the fact that overall quality of agricultural product distribution can be improved through this business model is another element of opportunity.

However, there are also somewhat negative aspects to consider too. First of all, the lack of capital power due to the nature of the startup company is the weakness of this business and must be overcome. In addition, the lack of human resource pools and low recognition of customer in the market compared to existing companies will also be a weakness.

This online business also possesses several environmental vulnerabilities. First, the IT business environment can be a big threat because it changes more rapidly than other fields. In addition, in the case of online distribution, the economy of scale is applied, so if existing retail giants that have not yet entered the business launch of similar platforms in the market, they may be pushed by the power of capital and interfere with the small companies. To add, the fact that existing customers can easily leave when similar platforms arise is a potential threat.

Table 11. SWOT Analysis of the Business Model

	(Positive)	(Negative)
(Internal)	**Strength**	**Weakness**
	● Unprecedented Business Model ● Innovative Culture ● Flexibility of Early Start-up	● Lack of Capital ● Lack of Human Resources ● Low Market Share
(External)	**Opportunity**	**Threat**
	● First Mover Advantage ● Emerging Market ● Increasing Customer Needs ● Few Competitors (so far) ● Distribution Quality Improvement	● Fast-Changing IT Environment ● Potential Entrants ● Government Regulation & Law Change ● Easily Leaving Customers

***Source*:** Produced by Kim Tae-hoon (the author), 2022

(3) Entry Strategies

The final Market Entry strategy will be conceived by combining each factor of SWOT analysis above into a 2x2 matrix and dividing it into four categories: Strength + Opportunity, Strength + Threat, Weakness + Opportunity, and Defense Strategy.

First, is an 'active offensive' strategy that combines Opportunity and Strength. While online market for food products, including agricultural products, is growing, aggressive strategies are needed in order to maximize the First Mover Advantage. Therefore, the largest priority is to attract customers by actively using initial investment for publicity. From a platform standpoint, customers can be divided into two categories: 'Producer' and 'Retailer'. Out of those two, it is relatively easy to attract the Retailer because they are always hungry for qualified products and will actively join the platform if those products are available for sale. In contrast, attracting the producer is completely different. Farmers are not familiar with online distribution system, so the platform should first promote and approach to them by itself. And in turn, this process, 'Smart Farm' technology, can play a decisive role.

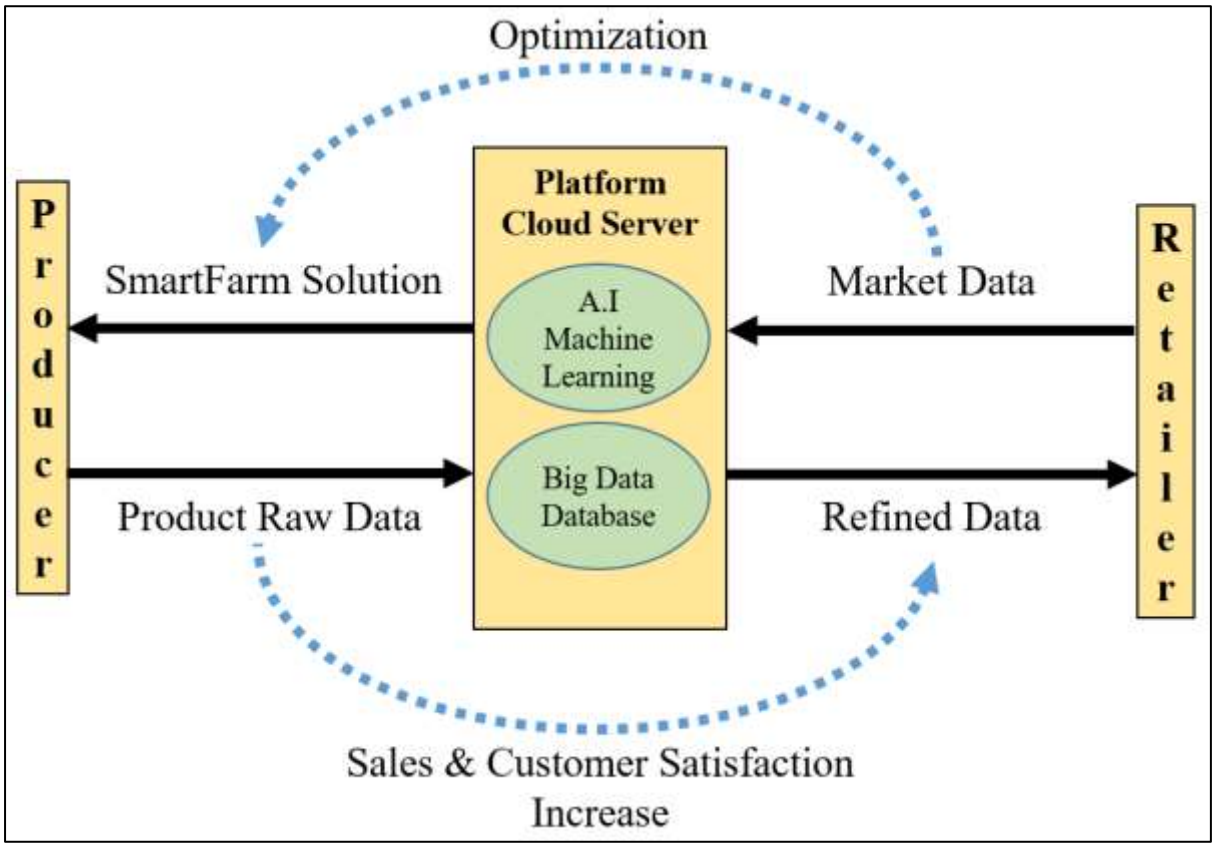
The term "Smart Farm" is widely used, from specific facilities where fully autonomous control is carried out through information processing technology to general facilities that can be remotely controlled (Yoo Do-il and five others, 2021). However, the biggest reason why smart farms have not become common thus far is that farmers who adopt smart farm generally use devices or facilities that need to utilize ICT technology and require a relatively high level of introduction cost (Kim Yeon-joong and two others, 2016).

However, according to various studies, smart farms have contributed to improving production quality, adjusting harvest times, and increasing production volume. In specific cases, there is a study that the income rate of domestic paprika farmers who introduced smart farm in 2018 increased by 12.8% compared to 2016 when it was not introduced (Lee Seung-hyun and four others, 2018).

Even with all of above, the biggest reason why the smart farm is a proper strategy in this business proposal is that all participants can have a considerable synergy effect when smart farms and retailers' sales activities combine with the platform’s big data, cloud, and artificial intelligence system.

For example, the virtuous cycle, as follows, can be considered (Figure 13). Producers, who produce strawberries, start cultivation with planting seedlings by using smart farm solutions. Smart farm can check the status of strawberries every hour and automatically match the optimal cultivation environment. In addition, the development status and growth data of strawberries collected through smart farms are stored in the cloud server and provided to retailers selling the products in real time. In this way, strawberries grown in an optimal state can be provided to consumers at a reasonable price through various online promotions and sales activities. As a result, producers can get more positive responses from the customers than strawberries that are sold expensive in the offline market as a traditional way. Furthermore, it is possible to steadily improve the smart farm setting value for the optimal strawberry cultivation environment by storing big data. Data generated from the producer side is stored in a cloud server and the optimal environment point can be derived by machine learning and analysis. And as this ecosystem circulation repeats, smart farm farmers are increasingly able to produce agricultural products of good quality, and consumer satisfaction can be improved as well.

Figure 13. Virtuous Cycle Ecosystem of Combining Smart Farm and Online Platform



***Source*:** Produced by Kim Tae-hoon (the author), 2022

The second strategy is 'Differentiation' that combines Strength and Threat of SWOT analysis. From the standpoint of early start-ups, in order to survive in the rapidly changing online distribution industry, it is necessary to focus on niche markets where retail giants cannot easily enter. To move smartly and rapidly, it is necessary to select few crops that can be efficiently applied to smart farms. In other word, it is more efficient to select and concentrate on a small number of crops rather than selecting various crops. As a practical example, among the major crops that have attempted to introduce smart farms in 2019, "Cucumber," "Potato," and "Oriental melon" producers were especially satisfied more than other crop producers (Table 12).

Table 12. Satisfaction with Smart Farm by Agricultural Product

Product	Very dissatisfied	Dissatisfied	Normla	Satisfied	Very satisfied	Average(Out of 5)
Tomato	0	4.4	29.4	54.4	11.8	**3.7**
Strawberry	4.9	4.6	14.8	68.6	7.1	**3.7**
Paprika	0	4.5	16	66.1	13.4	**3.9**
Cucumber	0	6.5	0	83.9	9.6	**4**
Potato	0	5.7	0	94.3	0	**3.9**
Oriental Melon	0	0	7.1	78.6	14.3	**4.1**

***Source*:** Korea Agricultural Research Institute, 2019

In addition, it is necessary to consider the 'required investment amount' too. This is because of the "burden of initial investment" that accounts for a large part of the factors that make farmers reluctant to introduce smart farms. When looking at Table 13, strawberries, paprika, and tomato farms requires from 30 to 60 million won. But it is possible to introduce a smart farm with a relatively small amount of capital. For example, potato farms only require 3.11 million won and oriental melon farms need 12.25 million won. Therefore, farmers who produce crops with low smart farm entry barriers such as oriental melon and potato can be set as a first customer target of the business.

Table 13. Required Investment Amount of Introducing Smart Farm by Product (Unit: 10,000KRW)

Product	Total Investment amount	Producer's Investment Amount
Tomato	5,906	3,660
Strawberry	6,017	3,122
Paprika	9,140	5,866
Cucumber	4,622	2,296
Potato	623	311
Oriental Melon	2,257	1,225

***Source*:** Korea Agricultural Research Institute, 2019

The third strategy is ‘Strengthening Weakness’ which is a combination of Weakness and Opportunity in SWOT. Due to the nature of early startups, various resources are scarce. Therefore, it is necessary to actively appeal to investors based on clear missions and visions to attract initial investment. In order to receive good investment, company must first consider what it should focus on to persuade investors. This is because when

investing in a company, each investor considers various factors such as professionalism, ownership, competitors, etc. There is a study on what factors the U.S. and Korean venture capital prioritize when investing in startups (Zacharakis and two others, 2002). As Table 14 below corroborates, the most important factors are Start-up's expertise, Leadership, and Experience. These factors are occupying higher scores than the market or other product factors.

Table 14. Priority of Considerations When Attracting Start-up Investment

Category	Variable	Investment Decision Making Priority	
		U.S.A	Korea
Start-up	Professionalism	5	6
	Leadership	7	4
	Experience	8	8
Product	Ownership	6	2
Market	Market Size	4	7
	Market Growth	3	5
	Number of Competitors	1	3
	Competition Intensity	2	1

***Source*:** Zacharakis and 2 others, 2002

Therefore, it is important to establish a mission and vision as the fundamental spirit of the company in order to formulate a clear leadership. First of all, the mission should be an answer to the question, “What is the reason and ultimate purpose of the company's existence?” The value that can be ultimately pursued through this business proposal can be "Distributing high-quality agricultural products to the market at reasonable prices through innovation in the distribution structure." Therefore, this can be determined as mission of the company. Second, in the case of vision, it should be the answer to “What is the desirable future image pursued by a company?” According to the mission set above, the future image that this platform can pursue is a “A virtuous cycle distribution ecosystem where all distribution participants can win-win with continuous development.” Based on these clear mission and vision, it will be able to sincerely persuade investors. (Table 15)

Table 15. Mission and Vision of the Business Proposal Start-up

Mission	Distributing high-quality agricultural products to the market at reasonable prices through innovation in the distribution structure
Vision	A virtuous cycle distribution ecosystem where all distribution participants can win-win with continuous development

***Source*:** Produced by Kim Tae-hoon (the author), 2022

The last one is a 'Defense Strategy' that combines Weakness and Threat of SWOT. The core of the platform's success is the number of customers. In order to attract customers and keep them on the platform amid the lack of resources and the threat of large capital distributors, ‘free promotion first and paid services next’ can be a proper strategy. Kakao Talk’s initial expansion is a good example of this. In the early days, Kakao Talk boldly increased its users by expanding servers and continuously providing high-quality services for free, in spite of a large deficit. Since then, after the whole nation started to use Kakao Talk, it has gradually introduced paid services such as launching emoticons or Kakao game items. This is an epitome of a successful platform business. Therefore, the agricultural product distribution platform concerned should also use this customer attraction strategy and strive to continuously bind customers within the platform. Initially, it is desirable to boldly attract customers by offering benefits such as "free of commission," "free of introduction of smart farms," and "free of live commerce," before gradually introducing paid services.

All strategies so far can be summarized as follows (Table 16).

Table 16. Final Summary of Business Entry Strategies

External / Internal	Opportunity	Threat
Strenth	**[Aggressive Offense]** Applying smart farm technology	**[Differenciation]** Selection and concentration of target agricultural products
Weakness	**[Strengthening Weakness]** Reinforcing leadership through establishing clear mission and vision	**[Defense]** Attracting customers with free services and holding customers with incremental introduction of paid services

***Source*:** Produced by Kim Tae-hoon (the author), 2022

3. Business Expansion Strategy

Based on the basic entry strategies above, following strategies to grow and expand the business will be devised in detail. First of all, customer segmentation and accurate targeting, determining the direction and position of the business will be implemented through STP analysis. Then, the step-by-step expansion strategies will be discussed based on this.

(1) STP Analysis

Target segments of platform business can be classified according to various criteria. First of all, it can be divided into B2B (Business to Business), B2G (Business to Government), and B2C (Business to Customer) according to the supply and demand characteristics of agricultural products. In addition, it can be classified into 'In-facility' and 'Field' depending on whether facilities are used to produce agricultural products or whether they are just developed on an open field. Moreover, it is possible to classify various crops according to each cultivation method. There are products grown through In-facility method including tomato, strawberry, paprika, cucumber, potato, and oriental melon, while the others are grown on the field including cabbage, chili, onion, and other tree-type fruits. In addition, it can be divided into 'Urban' and 'Rural' depending on the cultivation area.

Of all the segments above, the final target segments can be considered and be selected as follows. First, from the platform's point of view, the supplier is the 'Farmer' and demander is the 'Retailer'. Since both subjects have the characteristics of business operators, they can be regarded as 'B2B'. It will also be more suitable for In-facility agricultural products than Field products because the business uses 'Smart Farm' technology. In addition, in order to effectively recruit farmers in the early stages, potato or oriental melon, which is especially inexpensive to introduce smart farms, can be a more effective target. And lastly, urban area where many consumers are located would be more appropriate than the rural area for fast delivery.

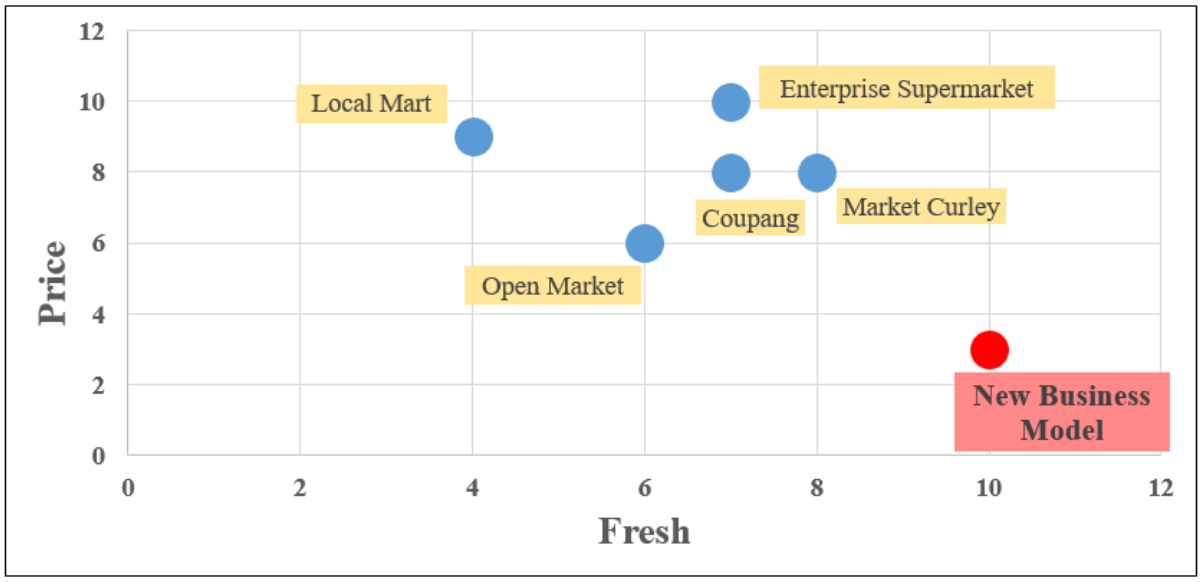
Finally, the position that this business model can show its strengths can be considered in a matrix of two quadrants as follows (Figure 14). The X-axis is a "Freshness" indicator of how fresh the agricultural product is, and the Y-axis is a "Price" indicator of how cheap the agricultural product. First of all, looking at the offline market, there are "Local Marts," which is more expensive than online but sells at a relatively reasonable price, and there are also "Enterprise Supermarkets" such as Lotte Mart and E-Mart, which distribute products by themselves and sell directly based on their capital power. Since enterprise supermarkets often supply agricultural products directly from the production area without going through the wholesale market, it is possible to sell products with higher freshness and higher price than Local Marts.

Moreover, there exists various other online distribution channels. There are channels such as Coupang and Market Curley that have "fast logistics" and "high-speed delivery" system based on large distribution centers, while there are general online distribution channels such as Naver, Gmarket, Interpark and Timon, etc. In the case

of high-speed delivery platforms, freshness is higher. But since a lot of input is required to maintain freshness, this is reflected in the fee and the price is also relatively higher. On the other hand, in the case of general open markets, the delivery speed is slower than high-speed delivery platforms, so the freshness can be lower. And the price is also relatively lower because most of the agricultural products are being sold in the form of 'direct delivery' from the farms without using warehouses.

To sum up, the position that this business model aims for is to provide consumers the "freshest product" at the "lowest price." It is possible to drastically lower prices by removing intermediate distribution processes such as local farmers' associations, wholesale markets, and intermediate retailers. And it is also possible to supply consumers with fresher products than Coupang or Market Curley, combined with fast customer service from professional online retailers and direct delivery from local farmers. In other words, 'Super Fresh' and 'Cheapest Price' can be the core positioning strategy of this business model.

Figure 14. Positioning Matrix Concept of the Business Model



***Source*:** Produced by Kim Tae-hoon (the author), 2022

The STP strategy so far can be summarized as follows (Table 17).

Table 17. STP Analysis of the Business Model

Segmentation	■ **Distribution Type :** B2B, B2G, B2C ■ **Cultivation Method :** In-Facility, Field(Crops) ■ **Product Type :** In-Facility (Tomato, Strawberry, Paprika, Cucumber, Potato, Oriental Melon, etc..), Field(Cabbage, Chili, Onion, Fruits, etc..) ■ **Cultivation Area Type :** Urban, Rural
Targeting	■ B2B + In-Facility + Potato/Oriental Melon + Urban
Positioning	■ Super Fresh ■ Cheapest Price

***Source*:** Produced by Kim Tae-hoon (the author), 2022

(2) Business Expansion Strategy

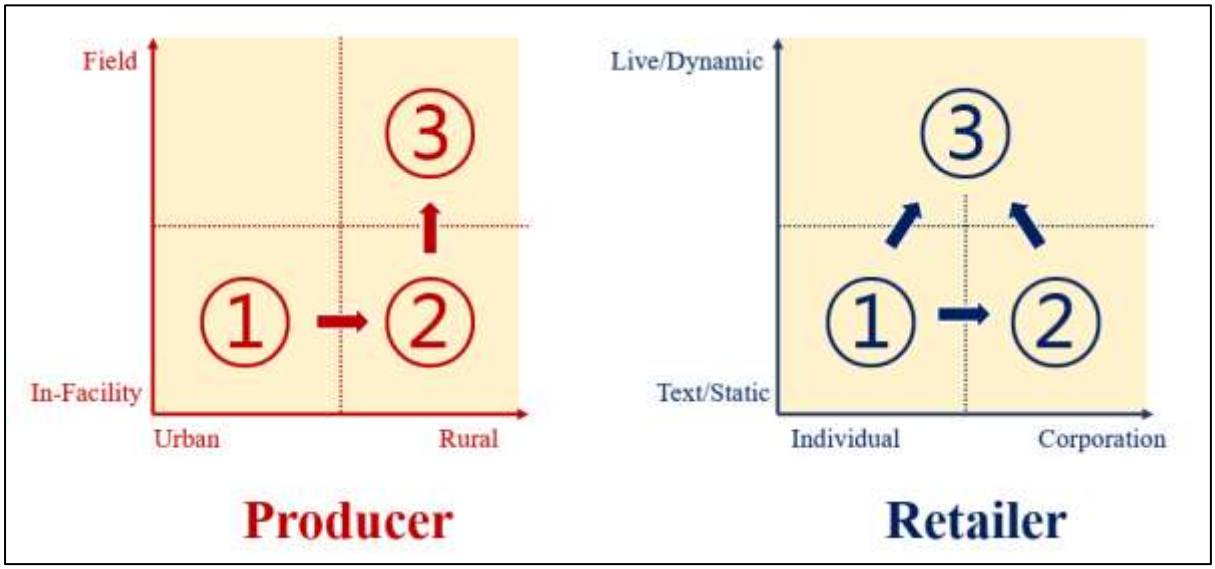
When the business becomes stable, it is necessary to devise an expansion strategy. As this business has entered the "gap market" targeting limited agricultural products, it should gradually expand its business area to develop its profitability.

The expansion strategy can be largely divided into two categories and eight subdivided dimensions. (Figure 15) The two main participants in the platform are Producer and Retailer. Producer can be classified into four dimensions depending on whether the production area is close or far from the city center, and if the cultivation method is In-facility or a field type. In the entry strategy part above, Urban & In-Facility was the primary target. And according to this, the most reasonable next step can be In-facility & Rural combination. This is because the virtuous cycle of smart farms that began from the primary targets can be applied and expanded to the rural as well. In fact, the difference between urban and rural is not much different except for the difference in 'delivery speed'. If in this way, in-facility farmers across the country are successfully attracted as customers, they will be able to target even farmers who grow fields in the Rural area.

In the case of the retailer, it can be subdivided into four different dimensions depending on whether it is an individual or a corporate business, and whether its selling method is a traditional HTML text or a dynamic method using live commerce and influencer marketing. The first target is an individual business operator that is engaged in online sales. This is because they will actively and voluntarily join the platform if they can receive quality guaranteed products. However, there are not only individual businesses online. Among them, there are also corporate business operators specialized in online distribution based on their professional system and capital power. Unlike individuals, they have already established supply chains, and prefer more verified and reliable

platforms to enter as their new distribution channels. Therefore, after successfully attracting individual business operators first, corporations should also be invited with offering VIP membership as a secondary target. And finally, it is necessary to support various dynamic tools such as live commerce or influencer marketing at the platform level so that retailers can move away from the traditional text-type sales method and promote and sell the products more easily.

Figure 15. Expansion Strategy of the Business



***Source*:** Produced by Kim Tae-hoon (the author), 2022

To add, in order to have comprehensive business capabilities and synergy in the long run, the business can be expanded into areas of Payment, Logistics, Insurance, and Loans such as Alibaba has implemented in the past. However, until reaching that level, the platform itself must achieve its own success and there are also many inner problems to be solved. Therefore, this proposal only focused on the platform's own strategy.

V. Conclusion

1. Discussion and Implications

The core idea of this business is 'innovation in the distribution structure of agricultural products through the introduction of online platforms'. The main users of the platform are the producers, who produce agricultural products, and the retailers, who sell them online. Producers provide product information to the retailers and retailers sell entrusted products online before delivering order information to the producer through the platform. Producers check the order information received from the retailers, and deliver the product directly to the customers. In addition, the platform acts as an intermediary connecting those two players in the middle, and the main source of revenue is the brokerage fee generated by bilateral transactions.

In order for the platform to be successfully launched, 'Smart Farm' technology can be used. The reason why smart farm is needed is that the farmers who are not familiar with online distribution can easily grow and maintain optimal productivity. Furthermore, as various distribution data occurs from production to final sales, it is stored in cloud server of the platform and analyzed with AI and machine learning. As a result, a huge ‘big data virtuous cycle distribution ecosystem’ can be established. In addition, it is better to start from a few crops such as potato and oriental melon that can apply smart farm quickly with low initial investment. And lastly, establishing a clear vision and mission to attract investment and securing loyal users through ‘free first, payment next’ strategy should be following.

If the business is successfully launched, it is necessary to apply its strategies to proper target segment and differentiate its positioning of ‘Super Fresh’ and ‘Cheapest Price’. In the case of retailer, the target should be expanded from In-facility farms in the urban areas to field farms in the rural areas. And in the perspective of the producer, it is befitting to attract individual business operators first and corporations should also be actively invited next through an attractive promotion such as live commerce or marketing support.

Since this business is an early start-up model, it would not be easy to implement and meet the market participant’s needs because of several limitations. However, if each participant finds the best efficiency in each specialized field by using this platform, it will be able to gradually replace the offline wholesale distribution structure by overcoming the limitations of the existing ‘direct transaction’ method. Finally, it will provide positive added value to all distribution participants, including customers in the future.

2. Research Limitations and Future Research

This business proposal has a few obvious constraints and it is necessary to recognize these limitations and consider how to overcome for achieving a successful business.

The first limitation of this business is whether the online platform can fully replace the offline wholesale-oriented distribution structure. So far, many attempts to reform this structure have failed. This is because the expiration date of agricultural products is very short and price fluctuates severely, in turn meaning there was no choice. Yet the wholesale market played an important role to quickly distribute large-volume of agricultural products nationwide in every season. Therefore, if this new platform business replaces the wholesale market with connecting producer and retailer through online, large-scale field products seem to be difficult to cover. In this model, only a few items produced on a small scale through in-facility cultivation can be handled first. In other words, this platform cannot entirely replace the existing offline agricultural distribution system, and must start in a niche market and gradually expand. Thus, the issue of how to distribute large-scale products through the platform will be a core task that this business should consider and solve in the long run.

The second limitation is that 'limited supply can lead to bleeding competition among retailers.' As this platform intrinsically serves as a bridge for retailer to receive products from producer to sell online, producer is relatively limited, while large number of retailers exist. In this case, if several sellers sell the same product, there is a very high possibility of bleeding competition and consumer prices will fall drastically. When consumer prices fall below the proper level, consumers may have the advantage of buying products cheaply. However, from an overall perspective, it will have a negative impact on the distribution ecosystem in the long run as distribution margins collapse. Therefore, it is also necessary to overcome this limitation to prevent price bleeding competition by regulating the ratio of producers and retailers in the platform at an appropriate level.

Furthermore, a substantial limitation is that even if the platform successfully settles, large retailers with various know-how and large capital power would also begin to implement this business, and there is ample possibility that platform users will leave rapidly to those new platforms. Therefore, it is necessary to try endless innovations on how to maintain the core of the business, ‘Super Fresh’ and ‘Cheapest Price’, and to persistently provide added value to participants.

Therefore, future research regarding this business model should be conducted based on these limitations. In order to replace whole offline wholesale market, strategy such as the introduction of an AI distribution center can be studied. In addition, for managing total distribution quality, research on verification and optimization strategy of retailers and suppliers can be followed. Subsequently, strategy to defend the business from the entrance of large distributors will also be a worthwhile subject. When these various studies are supported and applied to the platform business, the existing agricultural product distribution structure can be gradually and efficiently improved.

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