



Local Product Innovation and Development in the Province of Pangasinan, Philippines

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Abstract. This study empirically ascertained the innovation and development of local food products in Pangasinan, Philippines. Challenges in the production, such as lack of qualified employees and specialist able to create innovations, were studied. This study adopted data triangulation using mixed methods: the sequential explanatory-concurrent triangulation with the aid of descriptive survey and interview guide distributed to the twenty (21) DTI-registered Food Producers in Pangasinan, Philippines. Findings showed that the most observed innovation and development practices implemented in terms of local food production in Pangasinan, Philippines are the observance of product design and quality and product marketing support. The identified success factors include becoming trendsetters and penetration of the market in line with local food products and the limiting factors include lack of qualified employees and specialist able to create innovations on local food products. Local food producers in Pangasinan, Philippines cooperate more internally with establishments within their enterprise, their customers and suppliers. Cooperation of local food producers in Pangasinan, Philippines on innovation activities with academe is limited. Financial constraints are the most important barrier to innovation, so respondents may consider having linkages to private business organizations and even academe to seek for their support and assistance in utilizing the internet and improving packaging of the products. They may also consider familiarization of the continuum innovation to improve innovation and development practices.

Keywords: *local food products, product innovation, product development, success factors, limiting factors.*





INTRODUCTION

Businesses today are at the emergence of a new industrial revolution, practicing and adopting rapid innovation, development of products and even merging technologies, processes, and materials that show apparent divisions between physical, digital, and biological domains (Schwab, 2017). It notes that the dynamics of most markets seem to explain why it is almost impossible to find an industry that is not about innovation (Hurley and Hult, 2018).

Innovation has been recognized as a key driver of economic growth through the creation, diffusion and modification of processes that are being adopted by most companies worldwide (Guiné, Ramalhosa, & Cruz-Lopes, 2016). It is a significant, energetic development process, the result of which is a positive change towards improving the transformation process in companies and better satisfying customer needs (Andriopoulos & Dawson, 2010). Likewise, innovation nowadays has become a crucial tool for the modern companies to maintain their competitive advantage in today's highly competitive, volatile and globalized markets (Sajid et al., 2015) and the implementation of creative ideas with different approaches within an organization (Brink & Madsen, 2016). Innovation that matters to business is currently being introduced into national innovation systems as part of innovation and advanced technology development (Yokakul & Zawdie, 2011).

With the rapid development of technology, innovation and technological development are also watched very closely, and as far as the food industry is concerned, it is done to face competition and meet consumer demand. The food industry is constantly developing innovative products to face competition and meet consumer demands (Food and Agriculture Organization, 2017). Like any other industry, food production and process development are considered an integral part (Cooper & Kleinschmidt, 2016), even the lifeblood of a smart business strategy. There are several systems for classifying foods according to their novelty, such as product improvements and cost reductions (Rae, 2013). Trends in the food industry are challenging food product manufacturers and retailers, processors and food manufacturers, and other stakeholders to improve the efficiency of their operations and become more responsive to consumer demands, customer expectations, and regulatory frameworks (Pandey, 2018).

Innovation is also essential for the rapid development of most businesses, including the small and medium-sized enterprise (SMEs) sectors, in any economy. Most often in developing countries, this sector plays a crucial role in terms of employment, income generation and regional development.





Embracing change through innovation is undoubtedly the best solution to the fastest growing trends in the food industry particularly those who are into producing traditional food products worldwide while narrow margins and competition focus on the big growth themes. Driving innovation through integration into the food industry is important for value creation and product differentiation. Failure to develop new and improved products forces firms to compete solely on price, giving actors access to the most cost-effective inputs (De Brentani & Kleinschmidt, 2014).

On a global scale, SMEs in the food industry are changing very rapidly and have been recognized as entities and engines for equitable economic growth and development. Food SMEs are one of the main drivers of the European economy in terms of economic output and employment, most of these food SMEs in Europe focus on incremental innovation (Farraley & Mitchell, 2017). In India, 17 percent of food SMEs have introduced innovations that are new to the industry, new to India and new to the world (Pachava, 2018). In Thailand, their food SMEs contribute up to 5.3 percent to economic growth (Ueasangkomsate, 2016).

More than a quarter (27.3%) of all companies reported organizational innovations in the period 2012-2014. The second most common type of innovation was product innovation, which took place in 23.9% of all companies, followed by marketing innovation (22.8%) and process innovation (21.6%). It is important to note that individual companies may have introduced more than one of these types of innovations. Based on its analysis, it reflects to some extent the distribution of the overall population of businesses, as the vast majority are SMEs; in fact, there was almost no difference in the proportion of innovative businesses among the SME population compared to the general population. An extremely important barrier to competitiveness in the food SME sector is the lack of knowledge, skills and resources conducive to fostering innovation (OECD, 2017).

Beck and Demirguc-Kurt (2016) found that the growth of food SMEs is influenced by changes in the business environment such as joining trade fairs. However, successful innovative companies do not only rely on internal competences when it comes to innovation. Chesbrough (2013) pointed out that extending the innovation process and extending the company's boundaries outwards to increase the innovation potential increases the SME's research and development skills and absorbs knowledge from outside the company.

One Town, One Product (OTOP) originated from Japan in 1979 as One Village, One Product Movement (OVOP) where young people immigrated to big cities looking for better employment and opportunities. Local residents initiated community revitalization activities to review local resources and add new values and differentiation





to products to promote and sell. (Anh, 2013). This concept was adopted by several countries including the Philippines. Food SMEs in the Philippines benefit from attending trade fairs, which involve selling, promoting, networking and gathering information. Success stories of local food manufacturers have been achieved through the DTI's Kapatid Mentor Micro-Entrepreneurs (KMME) program and One Town, One Product (OTOP). Through these programs, local food manufacturers have been empowered with business knowledge, information and wisdom, built a good business network and learned a range of marketing strategies (DTI, 2024).

On the other hand, there are also factors that lead to the failure of innovations and limiting aspects. Among the major obstacles and major limiting factors to innovation for most SMEs are fear of innovation consequences, insufficient resources, entrepreneurial and employee conformism and the lack of a formal innovation strategy, which do not differ significantly from those in larger companies (Burgelman, 2012). Abdel et al. (2010) found that lack of managerial competence is the main reason for the failure of most SMEs. Dalberg (2011) found that food SMEs are still vulnerable by their lack of adaptation and implementation of innovation, despite major strides in innovation being made around the world. Quickie (2019) stressed that there seems to be a gap between awareness of the need to invest in innovation and the number of SMEs that actually do so because they lack the financial capacity, are unable Deploying technology and lacking resources to sustain it Innovation.

The Philippine economy and industry are struggling to cultivate innovation due to scarce resources, competing public policy goals, and institutional problems. In 2015, two fifths (42.9%) of companies in the state were active in innovation, while three in ten (30.7%) were product innovators and one in ten (9.2%) had projects to develop product or process innovations abandoned (Philippine Institute of Development Studies, 2017). The barriers to innovation in SMEs include the high cost of equipment and technology and the lack of technical human resources or engineers. Micro, small and medium-sized enterprises (MSMEs) should be particularly daring to innovate to be more productive and competitive, but they often do not do so due to the lack of financial capital required (Llanto, 2010).

Most industries in the Philippines are facing the challenges of a rapidly changing global environment especially caused by technological developments as well as advances in research and data science that have brought forth new products and services. These forces have changed the way Filipino companies do business. Now more than ever, the innovation agenda is taking root as there is a growing recognition that innovation is a game changer that companies that practice innovative behavior are more



productive and that the country and its people can remain competitive when more companies participate in an innovation ecosystem (Llanto & del Prado, 2015).

On the other hand, the ongoing diversification of consumer expectations in relation to food, implied both by globalization and by the desire to preserve one's cultural values and national identity, is fueling interest in the innovation of domestic traditional food products (Wyness et al., 2012). In an increasingly global marketplace, the traditional food industry must innovate to compete with increasingly tastier, healthier, safer, more convenient, more sustainable, cheaper, and more diverse food products (Jordana, 2015).

Local food is an important element of Pangasinan's culture and identity, thus contributing to the socio-economic sustainability of rural areas in Pangasinan, Philippines and increasing the variety of food choice for consumers is one of the areas of business innovation-focused by the government under DTI and DOST. Most food SMEs in Pangasinan practice innovation, festivals of every city and municipality influence businessmen in adapting innovation. Innovation is one of the key-driven components to success of SMEs; one of their notable innovation-related success undertaking is the introduction of boneless and bottled bangus, varieties of rice cake products (*puto* products) with different color variation and flavor; process and dried root crops in Calasiao, Urdaneta and Manaoag, Pangasinan; vacuumed fish products in Dagupan City and Binmaley, Pangasinan, Philippines - almost all of them are supported by the government in terms of product improvement and equipment support by the DOST (Philippine Information Agency, 2017).

With the challenging role of the governing bodies in helping SMEs' innovation practices, the government adopted the One Town One Product (OTOP), it is a priority program of government to promote entrepreneurship and create jobs. OTOP Philippines supports micro, small and medium enterprises (MSMEs) to manufacture, offer and market distinctive products or services. With the challenging opportunity the product innovation offers to SMEs, to see how innovation improve traditional food products, inbred skills and talents are harnessed to come up with distinctive products worthy of both domestic and foreign markets there could become.

Nevertheless, to increase their market share, local food products need to be improved by introducing innovations in line with the consumers' demand from different perspectives, including health, safety, taste and convenience characteristics. Therefore, the acceptance of an innovation depends on the innovation itself as well as on the carrier product to which it is applied, especially in the food domain. The researcher as a member of the academe who teaches marketing management in the tertiary level finds it a very motivating and productive endeavor to develop innovation





and development model to improve the food product innovation practices in Pangasinan, Philippines, thus this study.

METHODOLOGY

This study adopted data triangulation using mixed-methods: sequential explanatory and concurrent triangulation with the aid of a descriptive survey and interview guide. The locale of the study is in selected cities and municipalities of Pangasinan, Philippines more specifically Municipalities of Balungao, Binalonan, Binmaley, Calasiao, Lingayen, Manaoag, Mapandan, Mangaldan, Mangatarem, Sta. Barbara, and Umingan, Pangasinan, Philippines and Cities of Alaminos, Dagupan, San Carlos and Urdaneta. The respondents of the study are the twenty-one (21) DTI-registered Food Producers in Pangasinan, Philippines who are currently manufacturing/operating local food products and had submitted documents for DTI registration, all from Pangasinan, Philippines using a purposive sampling technique. The criteria in choosing the respondents are that they are of legal age, of any gender, married or single, manufacturers, wholesalers, with at least a minimum of Php15,000 start-up capital, 5 years and up in the said business at the time of the survey and are willing and voluntary submit themselves for a survey and interview phase for the benefit of the research. The main instrument used was a survey questionnaire and interview guide.

The researcher adopted the questionnaire from the study of Ing. Jana et al., (2011) from the University of West Bohemia Map of the Company Innovation Potential, and the DOST Manual and with the guidance of Mr. Cyrill John A. Domingo, DOST Food Innovation Research Specialist under the supervision of Dr. Roy C. Ferrer, Officer in Charge to the Office of the President, PSU Bayambang, Pangasinan, Philippines. The latter provided the researcher with a manual for food innovation that was used for the formulation of the questionnaire. On the other hand, the interview was also one of the instruments used in the study. The test and retest reliability has been proven to be strong, and the validity estimates for the dimensions are typically around .80. The Innovation Potential questionnaire by Ing. Jana et al (2011) consists of 80 items distributed into four sub-scales: product design and quality (20 items), production processes/product assembly (20 items), maintenance practices (20 items), and marketing practices (20 items). The tool was modified and aligned to product innovation and practices. The study utilized the average weighted mean for the qualitative part and company visits and face-to-face interviews with the business owners and staff will be utilized for the qualitative part.





RESULTS

The results presented in the following sections are based on survey data collected from twenty-one (21) local food producers in Pangasinan, Philippines duly registered at the DTI Pangasinan. The quantitative results are presented first, followed by the qualitative results. The quantitative and qualitative results are iteratively discussed with mixed methods data analysis. The section on the succeeding pages reports the results answering the three (3) research sub-questions.

Innovation and Development Practices Observed and Implemented in Local Food Production in Pangasinan, Philippines

Table 1.
Innovation & Development Practices in the following Dimension

Innovation and Development Criteria	Weighted Mean	Descriptive Rating
Product Design and Quality	3.62	H
Production Process Innovation	2.97	M
Maintenance & Support	3.08	M
Product Marketing Support	3.38	H
Overall Mean	3.26	H

Table 1 presents the summary of the extent of practice observed by local food producers in Pangasinan on innovation and development with an overall mean rating of 3.26. Of the four variables, marketing support ($X=3.38$) and product design and quality ($X=3.62$) are highly practice and observed by the local food product producers in Pangasinan, Philippines.

Implementation of Innovation and Development of Local Food Products in Pangasinan, Philippines

Product Design and Quality. During interviews with local food product producers in Pangasinan, Philippines, it was found that many of them focused on implementing innovation to improve their product design and quality. A common approach taken by these producers was to research new and trendy packaging ideas online that would suit their new products. One local food product producer from Calasiao sought assistance from the DOST to conceptualize a fresh look for their packaging. The motivation behind this was the observation of foreign clients and delegates at trade fairs, whose products had appealing and attractive packaging. This inspired the





producer to offer their product in a new and fashionable packaging. The local food producers in Pangasinan, Philippines recognize the importance of packaging in attracting customers and adding value to their products. However, they are aware that new packaging can incur additional costs and may take time to develop, potentially slowing down overall production. There is also a risk of unintentionally offending certain locals or groups if offensive symbols or designs are used. In terms of product quality, most local food products in Pangasinan, Philippines strive to offer a variety of high-quality options by avoiding the use of preservatives. Sopresa Products, for example, continuously innovates by researching different root crops to incorporate as new ingredients and flavors in their products. They have chosen beetroots due to their health benefits such as being low in calories and aiding in lowering blood pressure and improving athletic performance. Carrots are also considered for their health benefits, such as being low in cholesterol and weight-loss friendly. Overall, the local food producers in Pangasinan, Philippines implement innovation in product design and quality through the continuous search for new raw materials, developing new product tastes, creating appealing aesthetics, using well-designed product labels, utilizing attractive containers, and preserving the original taste and authenticity of the product by avoiding preservatives.

Production Process. The majority of local food product producers in Pangasinan, Philippines prioritize innovation in their production processes through linkages and collaborations with government agencies like the DTI and the DOST. They value the knowledge, technology, and support provided by these agencies. Some producers also allow researchers from various organizations to analyze their production processes and make improvements, such as developing new machinery or enhancing efficiency. However, some producers maintain traditional cooking methods and focus on quality rather than quantity. Nonetheless, production process innovations can lead to better product quality, increased efficiency, reduced costs, and ultimately, higher profitability for the businesses. It is important for companies to continually come up with fresh ideas and stay ahead of the competition to remain successful.

Maintenance & Support. The local food product producers in Pangasinan, Philippines demonstrate their commitment to innovation by allocating budgets for new projects and packaging, involving and training their manpower, hiring competent employees, and providing recognition and rewards. They value the suggestions and concerns of their employees, as they believe that their input is essential for maintaining their success in the market. These producers understand that product release is just the beginning, and continuous innovation is crucial. They actively seek feedback from customers through surveys, social media platforms like Facebook, and other marketing strategies. They hire marketing assistants to handle customer queries, update social media pages, and promote their products online. They also utilize



brochures and receive support from the DTI. The producers recognize the importance of incorporating customer feedback into future versions of their products to enhance usability, user-friendliness, features, and overall value. They view product development as an ongoing process that requires constant improvement based on customer input. Overall, the local food product producers in Pangasinan, Philippines prioritize continuous innovation and actively engage with their customers to ensure the long-term success of their businesses.

Marketing Support. The local food producers in Pangasinan, Philippines actively engage in various marketing strategies to promote their products. They allow resellers to sell their products, and offer discounts and reseller prices to support others' livelihoods. They distribute brochures and make them available in the action and training center of the DTI. The producers participate in festivals, and trade fairs, and display their products in OTOP centers. They value customer feedback, suggestions, and personalized orders, as they see them as potential sources for new product designs. It is important to note that sustaining innovation, which involves continuous improvements and breakthrough products, is a common practice among these producers. However, established competitors often have the advantage in sustaining technology battles due to their resources and profit motivations. Nonetheless, innovation has a significant impact on economies, business models, and the quality of life for people, transforming the way they live, work, and conduct business.

Success and Limiting Factors Identified with the Innovation and Development of Local Products in Pangasinan, Philippines

Table 2.

Success Factors Identified with the Innovation and Development in Local Products in Pangasinan, Philippines

Success Factors	f	%	Rank
Enhancing product design and quality allow the business to become trendsetter and penetrate the market in line with local food products	21	100%	1
improved brand recognition and value leads to earning support from the government agencies	20	95.24%	2
Reduce waste and cost and improve productivity	19	90.47%	3
Gained recognition in the local and international market	18	85.71%	4





The local food product producers in Pangasinan, Philippines have identified several success factors related to innovation and development. These factors include becoming trendsetters in the market, improving brand recognition, reducing waste and costs, and gaining recognition in the local and international markets. They take pride in their innovative products and recognize the importance of innovation in achieving sustainable growth and addressing competitive challenges. The participants emphasize the need for supportive mechanisms and technology adoption to enhance efficiency and reduce overhead costs. Overall, innovation plays a crucial role in driving competitiveness, profitability, and productivity in the local food industry.

Limiting Factors. Table 3 presents the identified limiting factors observed in implementing innovation and development in local products in Pangasinan, Philippines.

Table 3.

Limiting Factors Identified with the Innovation and Development of Local Products in Pangasinan, Philippines

Limiting Factors	f	%	Rank
Failure on product experiments	21	100%	1
Lack of qualified employees and specialist able to create innovations on local food products while preserving cultural and local ways in manufacturing the product	20	95.24%	2
Lack of government support in the process of innovation and development stage	19	90.47%	3

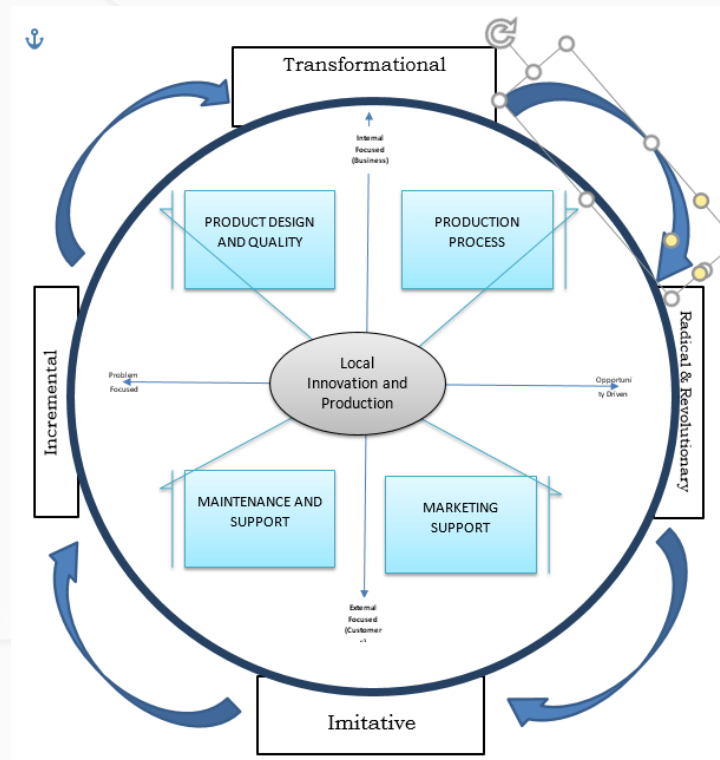
Table 3 reveals the limiting factors identified by local food product producers in Pangasinan regarding innovation and development. These factors include the failure of product experiments, the lack of qualified employees and specialists capable of creating innovative products while preserving local manufacturing methods, and the absence of government support during the innovation process. Participants expressed challenges in materializing ideas, preserving tradition while meeting evolving preferences, and the limited assistance available unless a product is successful. These limitations hinder the full embrace of innovation and highlight the need for supportive strategies and legislation for SMEs. Addressing these factors is crucial for fostering a more supportive environment for innovation in the local food industry.



Proposed Innovation and Development Model to Improve the Local Food Product Innovation Practices in Pangasinan

Traditional local food products possess unique values derived from the combination of specific raw materials, processing methods, and their place of origin. However, in today's global marketplace, the industry of native traditional foods needs to innovate to compete with more enticing and diverse food products. Innovation in traditional foods has occurred due to preservation and safety needs, as well as the industrialization of production processes. This study aims to enhance understanding of emerging developments in innovation among small and medium enterprises, particularly those in the local food manufacturing sector. The initial stages of entrepreneurship involve defining business boundaries and determining product offerings, which can be challenging, especially when adopting new technologies that require significant investments and have a limited lifespan to avoid product obsolescence. The proposed business development model aims to assist local food product producers in Pangasinan by providing informed decision-making support, thereby increasing their chances of success. This model addresses the specific challenges faced by these producers in relation to innovation and development, aligning their needs with the benefits of a flexible and well-designed business development approach. The secret to innovation is uncovering an unmet consumer need and filling it innovatively and creatively. The innovation continuum describes the spectrum from incremental to truly transformative innovations. At one end is incremental improvement, small innovations that simply take an existing process, product, or service and increase its effectiveness, quality, or value. Incremental improvement occurs when you take something that you are already doing and do it a little better. At the other end of the continuum is total transformation- a radical, overarching change that impacts the whole system. The two ends of the innovation continuum are very different; it is important to understand the unique properties of each. This continuum of innovation describes the spectrum from incremental to truly transformative innovations. At one end is incremental improvement small innovations that simply take an existing process, product, or service and increase its effectiveness, quality, or value. The process will be as follows:





Propose Four Quadrants of Innovation Development Model

The researcher developed the Tabadero-Rosales Four Quadrants of Innovation Development Model, which categorizes innovation into four quadrants: product design and quality, production process, maintenance practices, and marketing practices. The model emphasizes the need for coordination between these areas to effectively implement innovation.

In the product design and quality quadrant, the focus is on optimizing and improving business operations. This may involve streamlining processes and improving value creation. Deep process expertise and experienced facilitators are required to optimize existing processes and create value for innovative products.

The process innovation quadrant is closely related to product quality design. In this quadrant, the business owner reinvents products or processes using new technology or inventive approaches. It requires thinking outside the box and investing in training or finance programs to foster innovation. However, it is important to consider these investments as experiments with no immediate return on investment.

The bottom-left quadrant involves providing a great customer experience and improving existing products through continuum innovation. The goal is to uncover



unmet consumer needs and address them in innovative ways. Customer interviews and qualitative data analysis help measure the success of these improvements and prevent customers from switching to competitors' products.

The fourth quadrant focuses on marketing practices and promoting innovative products for future revenue generation. It requires individuals with unique mindsets and skill sets who can imagine and create new business opportunities. While many future product ideas may not succeed, hiring the right people can lead to successful innovations without wasting resources on unsuccessful ventures.

The model emphasizes the importance of avoiding the trap of trying to do everything for everyone and constantly shifting focus. Following the quadrants helps prevent a lack of focus and guides the implementation of new product ideas for sustainable business growth.

The text also discusses the concepts of incremental improvement and total transformation. Incremental improvement refers to small, gradual changes that can be implemented easily and involve a few individuals. On the other hand, total transformation involves radical and revolutionary changes that significantly impact the entire business. Expertise and significant effort are required for successful transformative innovation, and it is challenging to measure the outcomes and establish new baselines. Overall, the Tabadero-Rosales Four Quadrants of Innovation Development Model provides a framework for implementing and applying new product ideas to drive business growth, with a focus on coordination, customer experience, and innovation in various aspects of the business.

Discussion

Observing local food producers in Pangasinan reveals a moderate to high level of commitment to innovation and development in various aspects. They excel in areas such as seeking linkages with government agencies, supporting marketing through trade fairs and festivals, and understanding customer needs. However, they could improve in areas like involving manpower in suggesting improvements, adopting process innovation, and utilizing social media for advertising. Commitment to innovation is essential for the competitiveness and sustainability of local food producers. It enables them to stay updated with market trends, enhance product quality and design, and improve marketing strategies. Challenges like high costs, limited technology access, and a lack of knowledge hinder the full implementation of innovation initiatives. To further drive innovation, local food producers should collaborate with government agencies, trade associations, and academic institutions. These partnerships can provide valuable resources, knowledge, and networking





opportunities. Additionally, efforts should focus on enhancing training programs, exploring alternative materials and production processes, and leveraging social media for marketing. Overall, sustaining and maintaining innovation should be an ongoing journey for local food producers in Pangasinan. By continuously improving practices, embracing new technologies, and adapting to changing customer needs, they can strengthen their market position and ensure long-term success.

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