BUSINESS DEVELOPMENT STRATEGY FOR SMART WATERING PRODUCT OF PT. HIDROPONIK PADJADJARAN INDONESIA

Hasna Vidianti Rahmi[*)], Sophia Dwiratna Nur Perwitasari[**)1], Lukito Hasta Pratopo[**)]

[*)]Master of Agro-industrial Technology, Universitas Padjadjaran
Jl. Raya Bandung Sumedang KM.21 Jatinangor, Universitas Padjadjaran, West Java 45363, Indonesia
[*)]Department of Agricultural and Biosystems Engineering, Universitas Padjadjaran
Jl. Raya Bandung Sumedang KM.21 Jatinangor, Universitas Padjadjaran, West Java 45363, Indonesia

Article history:

Received
20 October 2023

Revised
30 October 2023

Accepted
12 November 2023

Available online
30 November 2023

Abstract: The urban hydroponic cultivation trend presents a promising opportunity for the advancement of hydroponic agro-industry within Indonesia. This phenomenon has been catalyzed by the innovation of the Smart Watering hydroponic kit introduced by PT. Hidroponik Padjadjaran Indonesia. The Smart Watering system, founded on the principles of self-watering irrigation and electricity-free operation, has unlocked new possibilities in hydroponic agriculture. This study aims to assess the formulation of strategic initiatives for the sustainable growth and continuity of Smart Watering business operations. Employing qualitative and quantitative research techniques, including IFE-EFE, BMC-SWOT, and AHP analyses, the investigation reveals that the IFE matrix scores 2.11, while the EFE matrix scores 2.70, positioning the company in quadrant V. Subsequently, a BMC-SWOT analysis identifies twelve potential strategies, which are further evaluated through AHP analysis to determine priority strategies. The findings underscore market penetration (0.689) as a key strategic criterion, with the top-priority strategy, W02 (0.156), emphasizing active engagement with local and regional hydroponic communities to foster network expansion and enhance human resource competencies. These findings provide a foundation for the implementation of growth and sustainability strategies in hydroponic agro-industry enterprises.

Keywords: Business Development Strategy, Hydroponic, IFE-EFE, BMC-SWOT, AHP

Abstrak: *Trend sistem budidaya hidroponik di perkotaan menjadi peluang dan potensi besar bagi para pelaku agroindustri hidroponik untuk mengembangkan penerapan sistem pertanian perkotaan sebagai salah satu alternatif pengembangan agroindustri yang dapat diandalkan di Indonesia. Potensi dan peluang pengembangan pertanian hidroponik dikembangkan oleh PT. Hidroponik Padjadjaran Indonesia dengan melahirkan inovasi kit hidroponik Smart Watering. Smart Watering merupakan inovasi produk hidroponik kit menggunakan prinsip self-watering system atau penyiraman otomatis dan mandiri serta zero electricity dalam proses produksinya. Tujuan penelitian ini adalah untuk melakukan analisis penyusunan strategi pengembangan usaha Smart Watering yang tepat agar usaha dapat terus bertahan dan berkembang. Metode penelitian yang digunakan berupa kualitatif dan kuantitatif dengan jenis penelitian deskriptif menggunakan metode pengolahan analisis IFE-EFE, BMC-SWOT dan AHP. Hasil matriks IFE memiliki total skor 2,11 sementara matriks EFE 2,70 sehingga perusahaan menempati sel V. Berdasarkan analisis BMC-SWOT, terdapat 12 alternatif strategi yang dapat kemudian dilanjutkan dengan analisis AHP untuk menentukan strategi prioritas dalam pengembangan usaha. Hasil analisis menunjukkan bahwa kriteria strategis dalam pengembangan usaha Smart Watering adalah penetrasi pasar (0,689) dengan prioritas strategi W02 (0,156) yaitu aktif terlibat dengan komunitas hidroponik lokal dan regional untuk memperluas jaringan dan meningkatkan kompetensi SDM. Temuan ini memberikan landasan penerapan strategi pertumbuhan/keberlanjutan usaha agroindustri hidroponik.*

Kata kunci: *Strategi Pengembangan Usaha, Hidroponik, IFE-EFE, BMC-SWOT, AHP*

[1] Corresponding author:
Email: sophia.dwiratna@unpad.ac.id

INTRODUCTION

Agro-industry development is one of the very strategic goals in national development efforts (Udayana, 2011) to utilize the agricultural sector in Indonesia as an economic activity which then contributes to improving the national economy (Fauzi et al. 2016). One of the agro-industrial development activities that have great potential can be directed at providing tools and systems that support agricultural activities as well as providing sustainable raw materials because this is closely related to the increase in the number of urban residents in Indonesia. Urban agriculture or urban farming can be a priority in efforts to overcome the issue of food security and sustainable agriculture in accordance with one of the global strategies regarding Sustainable Development Goals (SDGs) (Johnston, 2016) and Law Number 41 of 2009, article 1 concerning Agricultural Land Protection Sustainable Food.

Challenging urban conditions have given rise to agro-industrial innovation and also encourage agricultural business models that are different from conventional agriculture, one of which is the application of hydroponic system agricultural technology. This system can serve the community by providing healthier choices of food raw materials and supporting national production so that it is hoped that it can gradually reduce the level of imports (Taylor et al. 2012). The use of hydroponic techniques in agricultural cultivation has been recognized for its effectiveness in various countries for diversification (Taylor et al. 2012), however there are several limitations that hinder the process of adopting hydroponics on an industrial scale, including cost and level of experience. Designing low-cost hydroponic structures and lowering overall production costs is critical to increasing the commercialization of hydroponic farming (Kumar et al. 2021). The success of this design could increase the possibility of its future application involving interest in urban agriculture and sustainable food production (Caputo et al. 2020). So, with the evolution and innovation of the system through technological developments and the availability of input materials, such as water and nutrients, including the use of electricity, it is possible to implement a more cost-effective production system in urban areas (Nerantzis et al. 2018).

The potential and opportunities for developing hydroponic farming were developed by PT. Hydroponics Padjadjaran Indonesia by creating the Smart Watering hydroponic kit innovation. Smart Watering is an innovative hydroponic kit product using the principle self-watering system or automatic and independent watering, by utilizing gravity, the Archimedes principle and capillarity to flow and control the nutrient solution from the reservoir/tank to the plants, so that it is free from the use of electrical energy (zero electricity) and is environmentally friendly. The working mechanism of the Smart Watering hydroponic kit uses principles of self-watering system and zero electricity in the production process. It is an advantage that has high potential in the development of urban agro-industry because it can reduce production costs by not using electricity to run the system.

The potential and opportunities for developing hydroponic farming were developed by PT. Hydroponics Padjadjaran Indonesia by creating the Smart Watering hydroponic kit innovation. Smart Watering is an innovative hydroponic kit product using the principle self-watering system or automatic and independent watering, by utilizing gravity, the Archimedes principle and capillarity to flow and control the nutrient solution from the reservoir/tank to the plants, so that it is free from the use of electrical energy (zero electricity) and is environmentally friendly. The working mechanism of the Smart Watering hydroponic kit uses principles of self-watering system and zero electricity in the production process. It is an advantage that has high potential in the development of urban agro-industry because it can reduce production costs by not using electricity to run the system.

Smart Watering has been marketed since 2020, the same period as the outbreak of the Covid-19 pandemic. One factor in sales performance in 2020 was the involvement of the Covid-19 issue. This pandemic has triggered changes in people's lifestyles, with an increased focus on healthy lifestyles, a tendency to produce food independently, increased awareness of the need for food security, and the impact of work from home practices that encourage people to explore new activities. This is proven by research that compares the income generated by hydroponic entrepreneurs before and during the pandemic, showing an increase in demand for products and business income (Putri, 2023). Based on Smart Watering sales data in 2020–2022, illustrates an increase in sales year after year, but the level of sales per month is still experiencing significant fluctuations, this is related to uncertain demand. Business concept

online to offline which has been adopted by agro-industry including Hi-Up Indonesia in marketing Smart Watering, namely through E-Business, E-Marketing, and E-Commerce as well as B2B, B2C, B2G have not been able to maximize Smart Watering's sales volume. As a result, Hi-Up Indonesia's business development rate in promoting Smart Watering products has tended to increase a slow move. In contrast to the results of previous research which indicated that the O2O business model and E-Commerce is an effective approach for MSMEs (Wardhanie et al. 2018) because it can increase revenue (Rakanita, 2019) and the number of customers (Mastuti & DKW, 2020). Therefore, it is important to carry out an analysis of the preparation of appropriate Smart Watering business strategy planning to ensure the business can continue to survive and develop in the face of prevailing challenges, and in the end can make a significant contribution to business income, prosperity, and contribute to realizing food security.

Several studies regarding business development strategy analysis carried out identification Business Model Canvas (BMC) company to analyze the company's business model, define internal and external factors, and obtain an evaluation of the factors that become variables in exploiting strengths and overcoming weaknesses as well as taking advantage of opportunities and minimizing threats so that business goals are achieved. "The Nine Building Blocks" in BMC can be a factor in designing alternative business development strategies through the integration of the SWOT analysis method (Strengths, Weaknesses, Opportunities, Threats) (Wulandari et al. 2022; Maulina Cita, 2019). Some business development research uses SWOT analysis and is then integrated with the AHP method (Analytical Hierarchy Process) to group problems/information/assessments into a structured and systematic manner in selecting strategic alternatives so as to determine variables that have high priority. The use of the AHP method is carried out to minimize the element of subjectivity and inconsistency in making decisions because the SWOT analysis data is obtained from an expert in the business field (Paraduhita, 2017; Syaifullah, 2016; Febtyanisa, 2013).

Previous research relevant to this research was conducted by Febtyanisa (2013) regarding the analysis of strategies for developing organic vegetable businesses in farmer groups in Garut Regency. The aim of this research is to describe the organic vegetable production process and describe the Cibo Agro organic vegetable supply chain structure model, identify and examine internal and external factors related to the development of organic vegetables, and develop an appropriate and effective organic vegetable business development strategy for the Cibo Agro farmer group. The analytical tools used in this research are the IFE, EFE, IE matrices, SWOT analysis and AHP analysis. The results of the AHP analysis show that at the factor level, objective level, and synthesis results, priority strategies have been obtained sequentially to expand the market and maintain consumer confidence, as well as attract public interest in organic products, increase farmer income, and need to be continuously improved and promoted.

Evalia (2015) with research on palm sugar agro-industry development strategies using the IFE/EFE, SWOT and AHP analysis methods has the research objective of formulating a strategy for developing the palm ant sugar agro-industry in Lareh Sago Halaban District. The results of this research show the IFE (2.646) and EFE (2.298) values. The SWOT analysis in this research obtained alternative strategies in the form of SO, WO, ST and WT strategies with strategic priorities based on AHP analysis, namely providing assistance in the form of appropriate technology and packing technology for commercial scale (0.258).

This research aims to provide a useful contribution as a consideration instrument in selecting alternative strategies and appropriate strategic priorities for developing Smart Watering business. The study carried out took the form of the in depth interview, the research approach used is qualitative and quantitative with descriptive research using the IFE-EFE, BMC-SWOT, and AHP matrix analysis processing methods. This research integrates the results of IFE, EFE, IE, and BMC factors within the SWOT matrix so this approach enhances the comprehensiveness of the results by incorporating both internal and external viewpoints, while also ensuring alignment with the business model. SWOT Integration (Strengths, Weaknesses, Opportunities, Threats) and AHP (Analytical Hierarchy Process) are believed to be able to complement each other to determine the right strategy so that the subjectivity factor can be minimized. Aligned with its goals, the application of IFE/EFE/IE analysis, BMC-SWOT, and AHP is believed to offer resolutions to multi-criteria issues, thereby facilitating the formulation of a strategic business development plan for PT. Hydroponics Padjadjaran Indonesia.

METHODS

The research was carried out at a location determined deliberately (purposive method) namely PT. Indonesian Padjadjaran Hydroponics at the Greenhouse Hydroponic Learning Center (HLC) Universitas Padjadjaran, Jatinangor, Sumedang Regency. The type of data collected is primary data obtained directly through activities in depth interview and administering questionnaires to companies and experts. Sampling technique used purposive sampling which is based on consideration of the respondent's expertise and is deemed to understand and understand the conditions and problems of the hydroponic agro-industry, including 1) Director of Hi-UP Indonesia, 2) Operations Manager, 3) Marketing to obtain SWOT data and 1) Director of Hi-Up Indonesia, 2) Marketing Hi-Up Indonesia, 3) UNPAD Agricultural Industrial Technology Lecturer as academic expert, 4) Chair of PERHINDO, 5) Hydroponics Entrepreneur to obtain AHP data. Apart from that, secondary data was collected in the form of company data and a literature study to explore relevant information that could help in research analysis.

The research approach used was qualitative for interviews while quantitative methods were used for questionnaires. This research uses a type of descriptive research with a survey approach aimed at describing and describing the conditions of a phenomenon/ problem that occurs in a company and then describing the meaning of the data obtained in detail. Data and information collection methods are carried out through surveys, interviews, questionnaires and expert opinions. The data processing in this research is qualitative to formulate a strategy based on BMC elements as well as internal and external environmental factors using the IFE/EFE and SWOT matrix analysis methods (Strengths, Weaknesses, Opportunities, Threats) as well as quantitatively to determine strategic priorities using analytical methodsAnalytic Hierarchy Process (AHP). The framework of thought in formulating Smart Watering product development strategy can be seen in Figure 1.

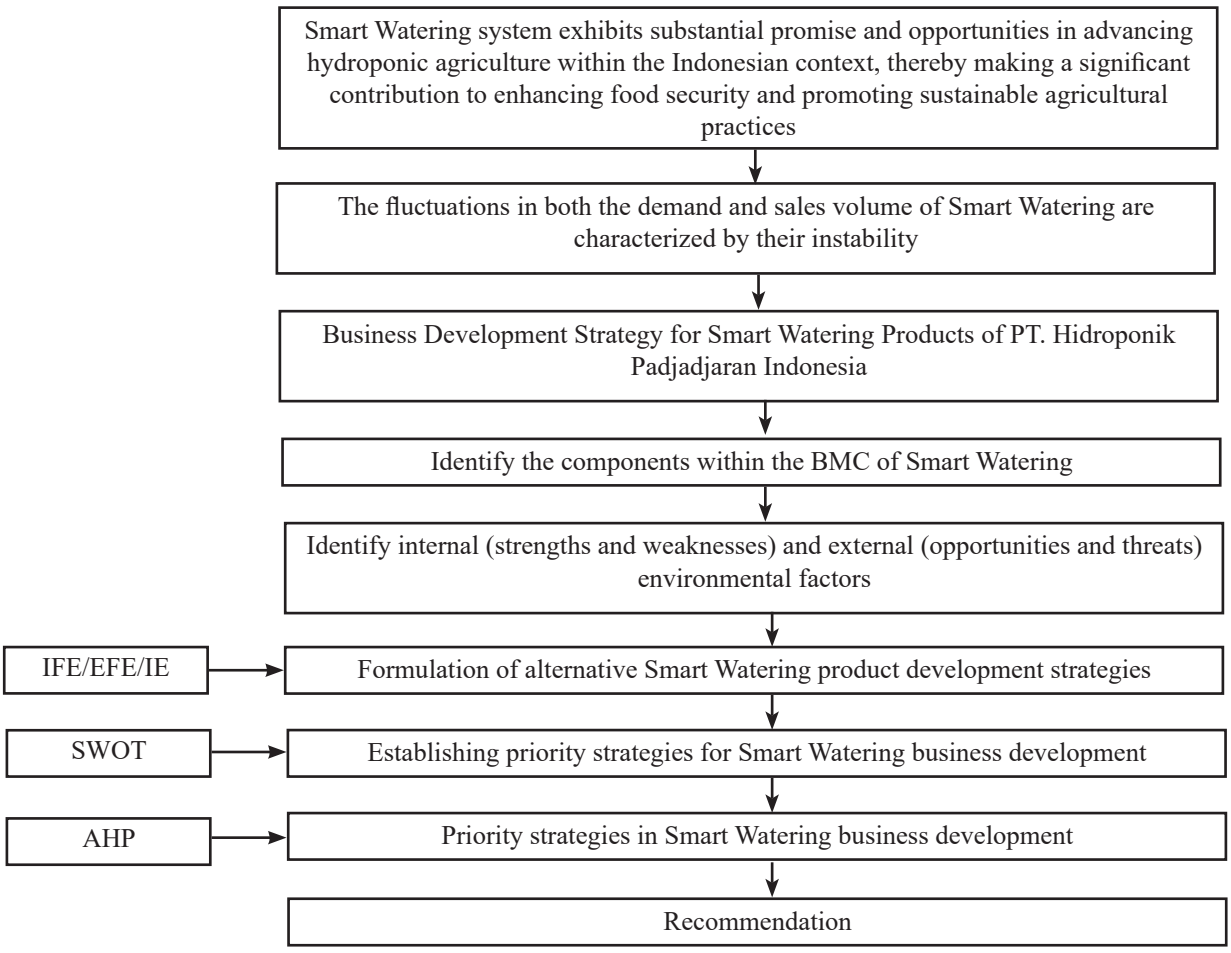

Figure 1. Framework of research

BMC analysis is a strategy formulation analysis whose results will become input data in the SWOT matrix. BMC identification was carried out by means of an FGD with the director of Hi-Up Indonesia to determine the strengths, weaknesses, opportunities and threats of each element in the Smart Watering business model.

Strategy formulation analysis in this research involves IFE, EFE, and IE analysis, the results of which will become input data in the SWOT matrix. Identification of IFE, EFE, and IE factors involves Hi-Up Indonesia directors, operational managers, and marketing. After conducting interviews to identify internal and external factors, the IFE and EFE analysis was carried out in 5 (five) stages (David, 2011), including: (1) Making a list of the main factors determining strengths and weaknesses (IFE) and the main factors determining opportunities and threats (EFE); (2) Determine the weight of each indicator in the pairwise comparison table using a scale of 1 (horizontal indicators are less important than vertical indicators), 2 (horizontal indicators are as important as vertical indicators), and 3 (horizontal indicators are more important than vertical indicators); (3) Giving ratings on a scale of 1, 2, 3, and 4; (4) Multiplying the weight of each factor obtained in stage (2) with the ranking determined in stage (3) to obtain the score for each indicator; (5) Add up the scores for each indicator to get a total value. After the IFE and EFE analysis, an IE analysis is carried out. IE matrix analysis, the IE matrix consists of the X axis, namely the total IFE matrix score and the Y axis, namely the total EFE matrix score**.**

SWOT analysis is carried out by matching the strengths (S), weaknesses (W), opportunities (O) and threats (T) factors with input data based on the BMC results and the IFE and EFE matrices. This matrix will produce 4 (four) possible alternative Smart Watering business development strategies, namely SO, WO, ST and WT strategies.

AHP analysis is carried out using the following steps: (1) Identifying problems and solutions in detail by formulating the goals to be achieved, determining criteria, and determining alternative strategies based on SWOT analysis; (2) Preparation of hierarchies and assessment of hierarchical levels; (3) Determining priorities by weighting criteria and alternatives in a pairwise comparison table; (4) Data processing using ExpertChoice software.

RESULTS

Strategy Formulation Analysis

Strategy formulation techniques can be integrated through 3 (three) stages, namely stage input consisting of the IFE/EFE/IE matrix, matching stage via SWOT, and strategic decision making stage. Analysis Input Strategy formulation is carried out by identifying the company's internal and external environmental factors that influence business development (David, 2011). Internal environmental identification is carried out to determine the internal strength and weakness variables of a company, while external environmental identification is carried out to determine opportunity and threat variables that are outside the company.

Internal Factor Analysis (IFE)

Identification carried out on internal factors can be studied through the parameters of the company's strengths and weaknesses regarding aspects of employee resources, management, production and operations, marketing and finance (Wheelen & Hunger, 2012). Identification of the internal factors of the Smart Watering business resulted in 4 (four) strength indicators and 7 (seven) weakness indicators which can be seen in Table 1. The results of the identification of strength and weakness factors are used as input which can be measured in formulating strategies by determining the weight and rating (rank) of each indicator (David, 2011) by expert respondents, namely the director (respondent 1), operational manager (respondent 2), and marketing (respondent 3) PT. Hidroponik Padjadjaran Indonesia. The results of the IFE analysis can be seen in Table 1.

Based on the score processing results shown in Table 1, the IFE matrix has a total score of 2.11 so that PT. Hidroponik Padjadjaran Indonesia is a company that has a weak condition internally because the total score is below the average of 2.5, but has a strength strategic factor value of 1.26 and a weakness strategy factor value of 0.85. This shows that the company has strategic internal strength factors that are greater than its internal weakness factors. The strength factor that has the most influence on the development of the Smart Watering business is adequate production technology and the product already has a trademark with a score of 0.32, while the strategic factor that is a weakness is the raw materials for making Smart Watering products which still depend on the online shop with a score of 0.21.

Table 1. IFE Matrix of Smart Watering Business

Internal Strategic Factors	Weight (a)	Rating (b)	Score (a × b)
Strength			
Specific market segmentation	0.085	3.7	0.31
Product value supports national issues	0.090	3.3	0.30
Production technology is adequate	0.107	3.0	0.32
Already have a brand	0.108	3.0	0.32
Weakness			
Management functions are not yet optimal	0.097	1.0	0.10
Raw materials depend on online stores	0.105	2.0	0.21
Limited marketing capital	0.082	1.0	0.08
Production volume is not yet stable	0.087	1.7	0.14
Limited development capital	0.076	1.3	0.10
Lack of promotional activities	0.079	1.3	0.11
Lack of brand awareness activities	0.082	1.3	0.11
Total	1		2.11

External Factor Analysis (EFE)

Identification carried out on external factors can be studied through the parameters of the company's opportunities and threats to macro environmental aspects such as economic factors, social factors, technological factors, government factors; and the micro environment which are external factors related to operational implementation such as the threat of new entrants, buyers, suppliers, and substitute products or services (Wheelen & Hunger, 2012). Identification of external factors for the Smart Watering business resulted in 5 (five) opportunity indicators and 4 (four) threat indicators which can be seen in Table 2. Determination of the weight and rating (rank) of each indicator was carried out by expert respondents, namely the director (respondent 1), operational manager (respondent 2), and marketing (respondent 3) PT. Hidroponik Padjadjaran Indonesia. The results of the IFE analysis can be seen in Table 2.

Based on the score processing results shown in Table 2, the EFE matrix has a total score of 2.70, this shows that PT. Hidroponik Padjadjaran Indonesia is a company that can respond and utilize opportunities and threats in the company's external environment very well because the company has a total EFE matrix score above the average of 2.5, with an opportunity strategic factor value of 2.01 and a threat strategic factor value of 0.69. The main opportunity factor that influences Smart Watering business is relevant institutional/government programs/ policies with the highest score of 0.48, while the strategic factor that is the main external threat to Smart Watering business is unstable raw material prices with a value of the highest weakness factor score was 0.27. Based on this, PT. Hidroponik Padjadjaran Indonesia can take advantage of institutional/government programs/policies that are relevant to Smart Watering business to support business development.

Internal-External (IE) Matrix Analysis

The IE matrix is a strategic analysis matrix that describes a combination of internal and external factors based on the IFE and EFE matrices. IE matrix analysis is carried out to determine or evaluate the company's position based on the identified aspects of the company's strengths, weaknesses, opportunities and threats, so that it can formulate an appropriate strategy based on the condition of the company's position. IE matrix mapping is carried out based on combining the total scores of the IFE matrix and the EFE matrix (Padil et al. 2015). The total combined IFE and EFE matrix scores will be mapped into 9 IE matrix cells, namely cell position I, II, or IV is the position growth and build (bloom and wake up); cell position III, V, or VII is the position hold and maintain (maintain and maintenance); and cell positions IV, VIII, or IX are positions harvest or divest (take the results or let go) (Maulina Cita, 2019) which can be implemented with 3 (three) main strategies, namely growth strategy (growth strategy),stability strategy (stability strategy), and retrenchment (savings) (Wheelen & Hunger, 2012). The total weighted score of the IFE matrix for the Smart Watering business is 2.11, while the total weighted score of the EFE matrix is 2.70 so that the

position of the Smart Watering business is in cell V. The mapping of the IE matrix can be seen in Figure 2. Figure 2 shows that the position of Smart Watering business is in good condition to hold and maintain. The V cell position (hold and maintain) Smart Watering products show that this business is moderate attractive industry so the strategy implemented is consolidation. The strategic approach is more defense-oriented with a focus on preventing declines in sales and profits. Companies in this position have the possibility to expand market share, production facilities and technology through internal growth or through external collaboration such as acquisitions or partnerships with other companies in the same industry (Rangkuti, 2014). The main strategies that can be chosen by companies can be grouped into various actions, stability growth strategies or intensive strategies such as market penetration, market development and product development (Syaifullah, 2016; David, 2011).

The market penetration strategy aims to increase the market share of Smart Watering products by carrying out intense marketing that emphasizes product superiority, besides this, it can include actions to increase advertising expenditure, carry out extensive sales promotions, or strengthen publicity efforts. The market development strategy is carried out to introduce products to new geographic areas so that the company can achieve a wider market share and increase sales. The product development strategy is carried out to increase sales by developing, improving and modifying Smart Watering products through new product innovation (creative and innovative) (Syaifullah, 2016).

Table 2. EFE Matrix of Smart Watering Business

External Strategic Factors	Weight (a)	Rating (b)	Score (a × b)
Opportunity			
Development of urban farming trends	0.104	3.7	0.38
Development of trends in people's healthy lifestyle patterns and lifestyles	0.102	4.0	0.41
Wide access to marketing/information technology	0.093	3.7	0.34
Relevant institutional/government programs/policies	0.130	3.7	0.48
The existence of a hydroponic community	0.121	3.3	0.40
Threat			
Products are easy to imitate	0.102	1.7	0.17
Raw material prices are unstable	0.137	2.0	0.27
Demand is unstable	0.102	1.0	0.10
The promotional power of similar businesses is better	0.109	1.3	0.15
Total	1		2.70

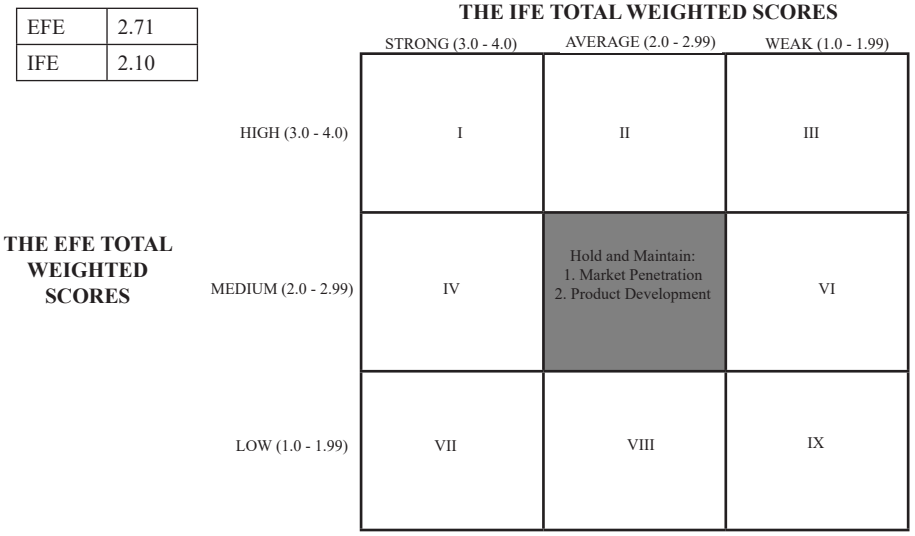

Figure 2. IE Matrix (Internal-External) of Smart Watering

SWOT Analysis

SWOT analysis involves identifying strengths (strength), weakness (weakness), chance (opportunities), and threats (threats) related to a company, product or project to find strategic steps based on evaluation of two sides, namely internal and external and determining strategies to exploit strengths and improve weaknesses, capture opportunities and overcome threats (Ma'ruf, 2022). The factors that became input in the SWOT analysis of the Smart Watering business, considering internal and external strategic factors in Table 1, Table 2, as well as product BMC analysis.

Strategy mapping on the SWOT matrix of the Smart Watering business was obtained by adjusting factors input so that this combination will produce 4 (four) types of alternative business development strategies, namely SO (strengths-opportunities), WO (weaknesses-opportunities), ST (strengths-threats), and WT (weaknesses-threats) strategies that can be implemented by the company. Results can be seen in Table 3.

Table 3 shows that 12 types of alternative strategies were obtained from matching the four groups of SWOT factors, so these alternative strategies can be utilized to maintain strengths and opportunities and minimize various weaknesses and threats of PT. Hidroponik Padjadjaran Indonesia towards the development of the Smart Watering business. These strategic alternatives include criteria for improving the company's management system and market penetration activities that can be carried out based on internal and external environmental factors.

Alternative strategy SO1, developing a marketing strategy that highlights hydroponic cultivation assistance and training programs for consumers can be one of the market penetration efforts. Training or education programs for consumers can increase understanding, interest and confidence in hydroponic cultivation. The training program can be integrated by including information about the Smart Watering hydroponic kit in the training materials and practice or trial of hydroponic cultivation using Smart Watering, so that consumers can find out how the Smart Watering hydroponic kit is used, benefit and the functions offered, as well as the benefits you can get if you do hydroponics using Smart Watering. Therefore, a market penetration strategy using mentoring and training program methods for hydroponic cultivation integrated with promotional activities for Smart Watering hydroponic kits can increase consumer awareness and interest in using Smart Watering products for hydroponic cultivation. This was proven in research conducted by Istiqomah et al. (2022) and Ruswaji & Chodariyanti (2020) that hydroponic training activities can increase understanding of hydroponic theory and practice, develop the ability to create hydroponic tools, and create enthusiasm for using hydroponic kits at home.

Table 3. The SWOT Matrix of Smart Watering Business

S-O STRATEGY	W-O STRATEGY
Develop a marketing strategy that highlights hydroponic cultivation assistance and training programs for consumers	Explore and establish collaboration by utilizing government/institution programs/policies that are relevant to product value
Improve online marketing strategies through social media and websites as well as offline by participating in relevant events	Actively engage with local and regional hydroponic communities to expand networks and increase human resource competency
Developing derivative products	Investing in product manufacturing/molding process development
S-T STRATEGY	**W-T STRATEGY**
Improve product quality and innovation	Look for alternative suppliers other than online stores that are more reliable and provide more stable prices
Develop promotional activities through digital marketing strategies by prioritizing local values and support for national issues aggressively and creatively to access international markets	Using collaboration with universities and government agencies to develop more sustainable partnerships
Optimize activities from upstream to downstream by controlling the supply chain	Establish partnerships with the molding industry

Alternative strategy SO2, strategy, improving online marketing strategies through social media and websites as well as offline by participating in relevant events is an effort to penetrate the market. Marketing strategies using digital marketing through social media and websites can help the interaction and transaction process which can be carried out instantly and globally. This is proven by research results which show that digital marketing on social media that suits the target audience has an influence on business development from the marketing, promotion and sales aspects (Raharja & Natasari, 2022). One way to improve digital marketing strategies is to optimize social media and websites by integrating the two platforms (Budi et al. 2023). By participating in relevant events, companies can achieve specific and precise segmentation, have the opportunity to increase brand awareness and education, and build relationships with audiences, thereby enabling long-term sales increases (Rabbani & Dharmawan, 2021).

Alternative strategy SO3, developing derivative products, is an effort to improve product management. By creating product variations that meet the needs or preferences of various consumers, companies can access wider market segments and attract customers who have already been determined or who have new preferences regarding products. This has the potential to increase sales by providing customers with a variety of choices. It has been proven in Ralahallo (2021) research that the development of derivative products has a significant positive impact on sales volume.

Alternative strategy WO1, exploring and establishing collaboration by utilizing government/institution programs/policies that are relevant to product value, is an effort to penetrate the market. This strategy can help achieve common goals and help companies achieve specific market segmentation and strengthen company brand awareness in specific markets. Like the collaboration in implementing the "Buruan SAE" program in increasing food security in Bandung (Putri et al. 2021), the program has objectives that are relevant to product value, namely focusing on the community to produce independent food which creates an opportunity for Smart Watering marketing.

Alternative strategy WO2, actively engaging with local and regional hydroponic communities to expand networks and increase human resource competency, can have an impact on improving company system management to minimize company weaknesses even though they do not directly affect it. Through the hydroponic community, companies can increase human resource competency by opening access to information regarding hydroponic conditions or trends that are currently needed by the market and developments in the agricultural sector, so that they can enrich the company's ability to manage existing systems or processes in the company by increasing product or service innovation. offered by the company, helps increase efficiency and productivity, as well as working together to create solutions to problems, weaknesses and threats that companies often face (Syaifullah, 2016).

Alternative strategy WO3, investing in developing product manufacturing/molding processes, is an effort to improve operations and production management. This investment can increase production efficiency such as reducing production costs, faster cycle times, increasing production capacity, and controlling production quality. In addition, developing product manufacturing/molding processes can produce higher product quality and produce technically superior products in line with consumer expectations. This indirectly impacts consumer confidence and companies can gain greater profits (Usman & Nanang, 2021)

Alternative strategy ST1, improving product quality and innovation is an effort to improve product management. Improving product quality and innovation can provide significant added value. In this case, achieving customer satisfaction is key, which contributes to the ability to build customer trust and loyalty (Lina, 2018). This strategy also has an indirect effect on increasing profit margins, because products that demonstrate superior quality and innovation tend to have the potential to be offered at higher prices. In addition, quality improvement and product innovation also have a positive impact on reducing risks associated with product quality. Previous research results show that innovation and product quality have a significant influence on achieving competitive advantage (Kurniasari & Utama, 2018).

Alternative strategy ST2, developing promotional activities through digital marketing strategies by prioritizing local values and support for national issues aggressively and creatively to access international markets is one of the market penetration efforts. Marketing carried out digitally can open up opportunities to reach international audiences (Raharja & Natasari, 2022). Being active in digital marketing by

highlighting local values in support of national issues can become a unique product identity that is different from competitors' products. Creative content that highlights local values to national issues can create a positive image for the product, thereby increasing the national audience's trust in the product and attracting international audiences. Digital marketing plays a significant role in brand awareness (Yacub & Mustajab, 2020; Oktaviani & Rustandi, 2018). By promoting product values based on local values and support for national issues, it is hoped that a connection can be created with the audience's values.

Alternative strategy ST3 optimizes activities from upstream to downstream by controlling the supply chain; WT1 is looking for alternative suppliers other than online stores that are more reliable and provide more stable prices; and WT3 establishing partnerships with the molding industry is an effort to improve supply chain management. This alternative strategy aims to overcome threats felt by the company, such as quite large operational costs due to difficulties in obtaining human resources and unstable raw material prices. Supply chain management is a strategic approach to planning, implementing and controlling the flow of goods, services, information and funds from suppliers to end consumers with a focus on collaboration to increase efficiency, effectiveness, manage risks and optimize profits (Chatra et al. 2023). Research also shows that the partnership model provides financial benefits to companies and produces competitive advantages through efficient cost control (Sutarmin, 2014). However, it should be noted that supply chain management is a very complex activity, requiring the ability to identify and resolve problems throughout the business process. Therefore, performance, added value and risk analysis is needed to achieve the level of effectiveness and efficiency of supply chain management (Putri et al. 2020).

Alternative strategy WT2, collaborating with universities and government institutions to foster more sustainable partnerships is one strategic step towards increasing market penetration. Mutually beneficial collaboration to achieve common goals provides access to resources such as facilities, development of research and product innovation, development of hydroponic cultivation technology, to involvement in relevant activities such as developing hydroponic training programs, food security and sustainable agriculture programs, and participating in programs that support target markets. This alternative strategic approach has the potential to reach market segmentation that was previously difficult to reach. A research concludes that collaboration between universities, government and industry provides benefits for all parties in finding solutions to the challenges faced so that it has a positive impact on national economic growth (Diana & Hakim, 2021).

These strategic alternatives present a strategic overview for PT. Hidroponik Padjadjaran Indonesia, leads to concrete steps to increase the success and sustainability of the Smart Watering business. Alternative strategies SO1, SO2, SO3, WO1, WO2, and WO3 include marketing approaches and management systems to focus on strengthening the company's position. Meanwhile, ST1, ST2, ST3, WT1, WT2, and WT3 aim to maintain competitive advantage. Overall, these alternative strategies form a comprehensive framework for optimizing Smart Watering business development.

AHP Analysis

Alternative strategies are becoming input in the AHP analysis, the results obtained are based on SWOT analysis, so that there are 12 types of alternative strategies that will be analyzed to determine the priority strategies that will be implemented for the development of Smart Watering business. The alternative strategies will be ranked in priority value from highest to lowest. AHP data processing uses software Expert Choice 11. Based on the results of the FGD, the hierarchy for Smart Watering product business development was formulated into 3 hierarchical levels, 2 types of strategic criteria, and 12 alternative strategies which can be seen in Figure 3.

Based on synthesis results expert assessment (5 experts), the consistency of the global ratio of the questionnaire has a value (consistency ratio) of 0.03. This shows that if the CR value is <0.1, the results of the hierarchical analysis are consistent and valid (Ma'ruf, 2022). Figure 3 shows that based on its importance to the goal of determining the priority of Unpad's Smart Watering business development strategy, the main strategic criteria that most influence business development are market penetration (0.622) and having a priority WO2 strategy (0.132), namely actively engaging with local and regional hydroponic communities to expand networking and increasing HR competency.

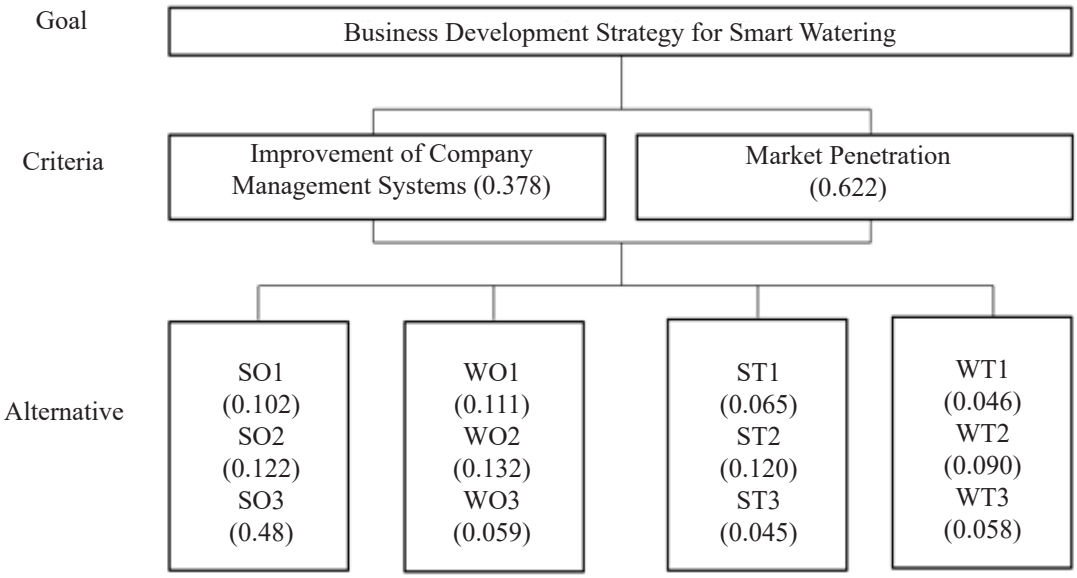

Figure 3. Hierarchical AHP Processing Results

Priority strategic alternatives are selected based on expert assessments to develop Smart Watering business by actively engaging with local and regional hydroponic communities to expand networks and increase human resources competency (WO2) can help companies minimize business weaknesses by taking advantage of existing opportunities, so that the hydroponic community can become a valuable resource for the company.

Smart Watering's business position based on the IE matrix is in position hold and maintain. So one of the recommended strategies is an intensive strategy such as market penetration. This is in line with alternative strategy priorities (WO2) because utilizing local and regional hydroponic communities not only has an impact on improving the company's system management but can be one of the company's marketing strategies that can be implemented to expand the marketing network and reach by creating brand awareness as well as introducing or promoting Smart Watering products to specific and appropriate market segments, expanding business opportunities, or even creating profitable partnerships. This is proven in research on marketing strategies for online-based merchant communities which shows that marketing through online merchant communities simultaneously influences marketing performance (Kuspriyono, 2020). One of the community marketing-based strategies can be carried out in hydroponic virtual communities. Research shows that virtual communities have an impact on increasing purchasing intentions (Ayuni, 2020).

Managerial Implications

Based on the overall assessment of the alternative strategies that have been formulated, it can be concluded that each alternative strategy has the potential to achieve the company's goals in developing Unpad's Smart Watering business. The strategy implementation process will be influenced by considerations related to resource capabilities, resource limitations and the company's time so that strategy implementation must be based on predetermined strategic priorities but still taking into account the company's internal conditions. Therefore, stakeholders in the Smart Watering business development are expected to be able to estimate the resources available to carry out the strategy, so that the company's goals in developing Smart Watering products can be achieved effectively and efficiently (Darmawan et al. 2017). This research can be used as a scientific reference for the hydroponic agroindustry, offering insights into internal and external factors that can be developed and utilized as business development strategies. The findings provide a foundation for implementing and refining strategies to develop business growth within the hydroponic industry. Consequently, the formulated strategies can be used as consideration for the hydroponic industry as they seek to advance and expand their operations.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The position of Smart Watering business is in cell V (hold and maintain). Based on AHP analysis, the business development strategy that the company can implement to achieve the goal of developing Smart Watering products is to emphasize market penetration as the main focus with the WO2 strategy priority, namely actively engaging with local and regional hydroponic communities to expand networks and increase human resources competency.

Through a synthesis of expert assessments, it was concluded that the best approach in developing a Smart Watering business is through collaboration with the community, aimed at increasing market penetration and improving the company's management system. This strategy is different from other product development options that may involve O2O or e-commerce concepts. In summary, the application of IFE/EFE/IE, BMC-SWOT, and AHP analysis has demonstrated its capability to offer resolutions for multi-criteria issues in alignment with the intended objectives.

Recommendations

The development of hydroponic equipment businesses such as Smart Watering can have an important role in supporting food security and sustainable agriculture programs. This is due to the ability of the hydroponic kit/equipment business to indirectly contribute to increasing agricultural productivity and increasing the carrying capacity of agricultural land. To maximize the potential for developing agribusiness such as hydroponic equipment, strong support from the government and related parties is very important in efforts to encourage existing policies and programs. This aims to increase access to information, education and training regarding the benefits and importance of implementing hydroponic system agricultural technology. In this way, public awareness of the potential to produce independent food can be built. To find out the right strategy for developing a hydroponic kit product business, it is necessary to carry out further research regarding the optimization of priority strategies implemented by the company.

FUNDING STATEMENT: This research was funded by the Ministry of Education and Culture of the Republic of Indonesia through the Master's Thesis Research Grant Program with contract number 148/E5/PG.02.00.PL/2023.

CONFLICTS OF INTEREST: The author declares that the published data has no conflicts of interest with any party.

REFEENCES

Ayuni RF. 2020. Bringing virtual communities into a marketing strategy to create purchase intentions in the social media era. *Journal of Indonesian Economy and Business* 35(2):112–128. https://doi.org/10.22146/jieb.53261

Budi H et al. 2023. Strategi social media marketing melalui dukungan teknologi informasi dalam kajian kualitatif pada UMKM Kota Bandung. Komversal: *Jurnal Komunikasi Universal* 5(2):244–261. https://doi.org/10.38204/komversal.v5i2.1499

Caputo S, Rumble H, Schaefer M. 2020. "I like to get my hands stuck in the soil": A pilot study in the acceptance of soil-less methods of cultivation in community gardens. *Journal of Cleaner Production* 258:120585. https://doi.org/10.1016/j.jclepro.2020.120585

Chatra A et al. 2023. *Solusi Manajemen Rantai Pasok (Issue June)*. Jambi: Sonpedia.

Darmawan H, Daryanto A, Sukardi S. 2017. Strategi pengembangan pt xyz dalam agribisnis teh hijau. *Jurnal Manajemen* 19(1):85-100. https://doi.org/10.24912/jm.v19i1.107

David FR. 2011. *Manajemen Strategis Konsep. Ed ke-12*. D.Sunardi, penerjemah. Jakarta: Salemba Empat.

Diana D, Hakim L. 2021. Strategi Kolaborasi Antara Perguruan Tinggi, Industri dan Pemerintah: Tinjauan Konseptual dalam Upaya Meningkatkan Inovasi Pendidikan dan Kreatifitas Pembelajaran di Perguruan Tinggi. Prosiding Konferensi Nasional Ekonomi Manajemen dan Akuntansi (KNEMA); Jakarta 10-11 Des 2020. Jakarta: Universitas Muhammadiyah Jakarta. hlm 1–14.

Evalia NA. 2015. Strategi pengembangan agroindustri gula semut aren. *Jurnal Manajemen dan Agribisnis* 12(1):57–67. https://doi.org/10.17358/JMA.12.1.57

Fauzi AR, Ichniarsyah AN, Agustin H. 2016. Peranan, peluang, dan kendala pengembangan agroindustri di Indonesia. *Jurnal Agroteknnologi* 10(01):49-62.

Febtyanisa M. 2013. Analisis strategi pengembangan usaha sayuran organik pada kelompok tani cibolerang agro Kecamatan Selaawi- Kabupaten Garut [tesis]. Bogor: Sekolah Program Pascasarjana, Institut Pertanian Bogor.

Istiqomah et al. 2022. Pemberdayaan masyarakat melalui pelatihan budidaya hidroponik sayuran sebagai upaya pembentukan agropreneur muda. *Jurnal Pengabdian Kepada Masyarakat* 6(2):145–153.

Johnston RB. 2016. Arsenic and the 2030 Agenda for Sustainable Development. Arsenic Research and Global Sustainability Proceedings of the 6th International Congress on Arsenic in the Environment; AS 2016. AS: United Nations. hlm 12–14.

Kumar S et al. 2021. Opportunities and constraints in hydroponic crop production systems: A review. *Environment Conservation Journal* 22(3):401–408. https://doi.org/10.36953/ECJ.2021.22346

Kurniasari RD, Utama A. 2018. Pengaruh inovasi produk, kreativitas produk, dan kualitas produk terhadap keunggulan bersaing (studi kasus pada kerajinan enceng gondok "akar"). *Jurnal Manajemen Dan Bisnis Indonesia* 3:467–477.

Kuspriyono T. 2020. Strategi pemasaran komunitas pedagang berbasis online dan personalisasi pemasaran terhadap kinerja pemasaran. *Widya Cipta: Jurnal Sekretari Dan Manajemen* 4(2):99–106. https://doi.org/10.31294/widyacipta.v4i2.8420

Lina R. 2018. Meningkatkan kualitas produk sebagai strategi fundamental dalam bersaing. *Scientific Journal of Reflection: Economic, Accounting, Management and Business* 1(1):91–100.

Ma'ruf A. 2022. *Analisis Strategi.* Yogyakarta: Andi.

Mastuti DN, Trisnawati DKW Y. 2020. Strategi pemasaran dengan optimalisasi promosi, kelas sosial, dan citra merek untuk pengambilan keputusan konsumen untuk berbelanja online (studi kasus di mataharimall.com). *Excellent: Jurnal Manajemen, Bisnis, Dan Pendidikan* 7(1):105–114. https://doi.org/10.36587/exc.v7i1.662

Maulina CD. 2019. Strategi pengembangan bisnis minuman ringan jamu dengan metode business model canvas dan integrasi swot - anp (studi kasus UKM Jamu Oetie di Malang) [skripsi]. Malang: Teknologi Pertanian, Universitas Brawijaya.

Nerantzis ET, Koliopoulos TK, Sharma SK. 2018. Urban vertical hydroponics. *Emerging Environmental Technologies and Health Protection* 1:13–18.

Oktaviani F, Rustandi D. 2018. Implementasi digital marketing dalam membangun brand awareness. *PRofesi Humas* 3(1):1–20. https://doi.org/10.24198/prh.v3i1.15878

Padil AY, Rukmi S, Kurniawan D. 2015. Usulan strategi perusahaan cv kurnia jaya menggunakan matriks perumusan strategi. *Jurnal Reka Integra* 3(2):115–126.

Paraduhita LM. 2017. Strategi pengembangan susu kambing di Bogor [tesis]. Bogor: Sekolah Program Pascasarjana, Institut Pertanian Bogor.

Putri FP, Marimin, Yuliasih I. 2020. Peningkatan efektivitas dan efisiensi manajemen rantai pasok agroindustri buah: tinjauan literatur dan riset selanjutnya. *Jurnal Teknologi Industri Pertanian* 30(3):338–354. https://doi.org/10.24961/j.tek.ind.pert.2020.30.3.338

Putri NR. 2023. Analisis pendapatan sebelum dan masa pandemi pada usaha tani selada hidroponik (studi kasus: Queen Farm di Kota Pontianak). *Fruitset Sains: Jurnal Pertanian Agroteknologi* 11(4):311–319.

Putri SDR, Yuningsih NY, Darmawan I. 2021. Implementasi program buruan SAE (Sehat, Alami, Ekonomis) dalam meningkatkan ketahanan pangan di Kota Bandung pada tahun 2020-2021 (studi pada Dinas Kesehatan Pangan dan Pertanian Kota Bandung). *Jurnal Administrasi Pemerintahan (JANITRA)* 3(1):14–26.

Rabbani A, Dharmawan A. 2021. Event sebagai komunikasi pemasaran untuk mempromosikan merek lokal (studi kasus pada Basha Market). *Commercium* 4(2):183–193.

Raharja SJ, Natasari SU. 2022. Pengembangan usaha umkm di masa pandemi melalui optimalisasi penggunaan dan pengelolaan media digital. *Kamawula: Jurnal Pengabdian Kepada Masyarakat* 2(1):108–123. https://doi.org/10.24198/kumawula.v4i1.32361

Rakanita AM. 2019. Pemanfaatan e-commerce dalam meningkatkan daya saing UMKM di Desa Karangsari Kecamatan Karangtengah Kabupaten Demak. *Jurnal EKBIS* 20(2):1280–1289. https://doi.org/10.30736/ekbis.v20i2.237

Ralahallo BAB. 2021. Pengaruh strategi pengembangan produk terhadap peningkatan volume penjualan plywood pada PT. Waenibe Wood Industri. *Hipotesa* 15(2):72-83

Rangkuti F. 2014. *Teknik Membedah Kasus Bisnis Analisis SWOT.* Jakarta: PT. Gramedia Pustaka Utama.

Ruswaji R, Chodariyanti L. 2020. Pemberdayaan masyarakat desa kepada kelompok ibu-ibu pkk dan karang taruna melalui program pelatihan "hidroponik". *Jurnal Abdimas Berdaya: Jurnal Pembelajaran, Pemberdayaan Dan Pengabdian Masyarakat* 2(1):1-9. https://doi.org/10.30736/jab.v2i01.32

Sutarmin. 2014. Model kemitraan dalam manajemen rantai pasok untuk meningkatkan keunggulan bersaing perusahaan. *Jurnal Bisnis dan Manajemen (JBIMA)* 2(2):166–181.

Syaifullah H. 2016. Identifikasi Perumusan Strategi Pada Pengembangan Usaha Budidaya Sayur Hidroponik [tesis]. Surabaya: Program Magister, Institut Teknologi Sepuluh Nopember.

Taylor RW et al. 2012. Making global cities sustainable: urban rooftop hydroponics for diversified agriculture in emerging economies. *OIDA International Journal of Sustainable Development* 5(07):11–28.

Udayana IGB. 2011. Peran agroindustri dalam pembangunan pertanian. *Jurnal Teknologi Industri Pertanian* 44(1):3–8.

Usman R, Nanang N. 2021. Kualitas produksi plastic moulding decorative printing metode six sigma failure mode effect analysis (fmea) kemasan cat plastik. *Jurnal Teknologi* 13(1):25–32.

Wardhanie AP, Kartikasari P, Wulandari SHE. 2018. Pertumbuhan bisnis melalui metode o2o pada usaha mikro, kecil dan menengah (UMKM) di Indonesia. *Jurnal Ilmiah Bisnis dan Ekonomi Asia* 12(2):76–83. https://doi.org/10.32812/jibeka.v12i2.10

Wheelen TL, Hunger JD. 2012. *Strategic Management and Business Policy*. Ed. ke-14. London: Pearson.

Wulandari NA et al. 2022. Strategi pengembangan usaha cv vanana jaya sinergi menggunakan metode business model canvas (bmc), ssot dan quantitative strategic planning matrix (qspm). *Jurnal Agroindustri Berkelanjutan* 1(2):271–282.

Yacub R, Mustajab W. 2020. Analisis pengaruh pemasaran digital (digital marketing) terhadap brand awareness pada e-commerce. *Jurnal Manajerial* 19(2): 198–209. https://doi.org/10.17509/manajerial.v19i2.24275