International Journal of Technology 15(3) 561-570 (2024)
Received October 2021 / Revised August 2022 / Accepted January 2023

International Journal of Technology

http://ijtech.eng.ui.ac.id

Managing and Mitigation of Risk at Batik Laweyan During the COVID-19 Pandemic

Hafidh Munawir[1*], Makruf Kausar[1], Indah Pratiwi[1], Ahmad Kholid Alghofari[1]

[1]*Departement of Industrial Engineering, Faculty of Engineering, Universitas Muhammadiyah Surakarta, Pabelan, Surakarta, 57102, Indonesia*

Abstract. The COVID-19 pandemic has severely impacted Indonesia's business sector, especially business at Batik Laweyan. Business at Batik Laweyan cannot be separated from the risks that cause disruption of sales and income earned. This study aims to identify the risks faced by Batik Laweyan and to provide alternative risk mitigation strategies for Batik Laweyan during the COVID-19 pandemic. The method used in this research is Failure Mode Effect Analysis (FMEA) which identifies risks by weighting the Risk Priority Number and Analytical Hierarchy Process (AHP) as an alternative strategy to determine the risk mitigation of Batik Laweyan during the COVID-19 pandemic. The results of this study processing FMEA data obtained a total of 12 risks and priority risks from each factor, namely the risk of changes in consumer behavior, the risk of decreasing demand, the risk of changes in the budget, and the risk of implementing large-scale social restriction (known as PPKM). To mitigate risk, 14 alternative strategies were developed, and priority mitigation strategies were selected using AHP. The priority mitigation strategies selected through the AHP method for each risk factor are optimally utilizing technology while realizing the digitization of MSMEs, innovation, and product shifting, producing products that are trending in the community and capable of being produced by MSMEs, improvement and cost control in production and purchasing of raw materials more structured and utilize e-commerce as a digital sales market and utilize digital as product promotion (Digital Marketing).

Keywords: AHP; COVID-19; FMEA; Mitigation; Pandemic; Risk

1. Introduction

The current globalization has been growing rapidly. It affects the industrial world. The changes that are in line with the development of science and technology make competitiveness in the industrial world very tight (Muslimah *et al*., 2021). Each organization is always required to be able to develop by following the changing times (Kayı and Sakarya, 2020). Businesses that can survive and thrive generally have the right development and marketing strategies. The strategy of each business needs to be reviewed and developed continuously so that the strategies implemented can follow market changes that are always dynamic. The COVID-19 pandemic has had a broad impact not only on human health but also on almost all fabrics of human life (Candra *et al*., 2021; Al-Doori *et al*., 2021). On March 2, 2020, Indonesia reported two confirmed cases of COVID-19. As of March 25, 2020, Indonesia has confirmed reports of 790 COVID-19 cases from 24 provinces

*Corresponding author's email: hafidh.munawir@ums.ac.id, Tel.: +62271-717417; Fax: +62271-715448
doi: 10.14716/ijtech.v15i3.5276

in Indonesia (Alfrian and Pitaloka, 2020). The spread of COVID-19 can indeed be increasingly widespread and spread throughout the world until finally, COVID-19 has been declared a global pandemic (Cunningham *et al*., 2021). The paradigm is that the growth of COVID-19 can develop rapidly and widely because transmission quickly occurs through human contact who has been contaminated with the virus by a person (Akseer *et al*., 2020). So that the current acceleration of the spread of COVID-19, which was initially only in the territory of China, has now reached all regions in Indonesia.

The COVID-19 pandemic resulted in a huge loss due to the pandemic, which caused death. It brought social and economic instability to many regions (Berawi *et al*., 2020). Based on research from the Central Statistics Agency. There was a decline in income due to the COVID-19 pandemic, which had a very long impact and caused many businesses to suffer material and financial losses. Around 82.29% of UMB (Large Medium Enterprises) and 84.20% percent of MSEs (Small Medium Enterprises) experienced a decreased income due to the COVID-19 pandemic in 2020 (Hasibuan and Ashari, 2020). The COVID-19 outbreak has changed places and how people buy goods and services. Selling and accelerating structural changes in the industry that are felt by all people (Agus *et al*., 2021). Almost all groups of people are cautious in managing their financial expenditures because of uncertainty about when this pandemic will end (Pakpahan, 2020).

Solo is a Central Java city still bound by Javanese culture (Muslimah, 2020). Solo is determined to continue maintaining and preserving Javanese culture; for example, Solo batik is known throughout Indonesia and is a mainstay product for export (Setyanto, Samodra, and Pratama, 2015). The batik industry is one of the Small and Medium Enterprises located in the Laweyan sub-district, Surakarta City, which has been affected by the COVID-19 pandemic. Batik Laweyan during the COVID-19 pandemic cannot be separated from the risks that cause disruption of sales and income earned. Hazards include experiencing fluctuations in raw material prices, a decrease in demand from retailers, damage to tools in batik printing, batik production that has not optimal quality, such as batik cloth has defects, and so on. Risks that occur as follows can result in decreased sales revenue and production volume during the COVID-19 pandemic. The changes can cause losses, so it cannot meet demand needs.

This study wants to find out how companies deal with a pandemic. In responding to a pandemic, two questions are compiled, namely: what are the risks faced by companies during the pandemic? And how to handle and reduce these risks?

2. Methods

The research was conducted at the Batik Laweyan Center, located at Jl. Dr. Rajiman No. 521, Laweyan, Surakarta. The village of Laweyan is home to one of the oldest and most central traditional batik industries in Indonesia. This study uses a quantitative approach to obtain relevant data about the characteristics, behaviors, and variable relationships of existing group representations (Suci, 2017). Five stages of the research procedure were completed in this study.

The first stage is to identify the problem, problem formulation, and research objectives. The second stage is data collection. Primary data sources were obtained from observation, interview, and questionnaire techniques. The primary data needed is what risks have occurred and the potential risks that may occur. Questionnaires were conducted on batik entrepreneurs in Kampung Batik Laweyan. The selected respondents were 3 entrepreneurs with large enough capital, 2 entrepreneurs with medium capital, and 2 administrators at the Kampoeng Batik Laweyan Development Forum. To complement and support the

primary data, researchers need to conduct literature studies related to the research topics mentioned above, such as books, journals, electronic articles, and library research.

The third stage of data processing, identification, and risk assessment uses FMEA, which has a scale value of 1-10 in each aspect, namely Severity (S), Occurrence (O), and Detection (D). It then ranked and determined the risk level based on the Risk Priority Number for each aspect of the existing danger. The following is the determination of the risk level based on the RPN value can be seen in Table 1.

Table 1 Risk Level Based on RPN Value

Risk Level	RPN Value Scale
Very Low	$x < 20$
Low	$20 \leq x < 80$
Medium	$80 \leq x < 120$
High	$120 \leq x < 200$
Very High	$x > 200$

Through the RPN classification, it can be seen that the risk of a high RPN value is included in the very high category so that it can be used as a priority to determine prevention, mitigation, and strategies for the highest level of risk so that the company's business operations can continue to operate in the best way if problems or disasters occur.

The fourth stage is determining alternative risk mitigation strategies and processing questionnaire data from the AHP method. Risk mitigation is taking steps to reduce and overcome losses that can result from the impact of risk (Oktiarso and Nadira, 2019). In the AHP questionnaire, quoted (Ganguly and Kumar, 2019) specifying, the quantitative has a scale of 1-9 in the assessment of the comparison of the importance of an element to other elements. Then a hierarchical structure was made based on the calculation of the AHP method and design to mitigate the risks to Batik Laweyan during the pandemic, variables with priority risk, and alternative strategies with proposed strategies to mitigate the existing priority risks.

The fifth stage is to analyze the processing results and draw research conclusions. Based on the results and conclusions, the proposed alternative mitigation strategy for Batik Laweyan during the COVID-19 pandemic was determined.

3. Results and Discussion

3.1. General Description

This research was conducted at the Batik Laweyan Center, located at Jl. Dr. Rajiman No. 521, Laweyan, Kec. Laweyan, Surakarta City, Central Java. This study involved the administrators of the Batik Laweyan Development Forum. To determine alternative strategies, the researcher also consulted with several Batik owners in Laweyan, such as Batik Putra Laweyan, Batik Mahkota, Batik Lor'ing Market, Batik Ozz, and Batik Ekru.

3.2. Identification of Risks in Batik Laweyan

Risk identification is carried out through literature studies, observations, and interviews with respondents involving experts, namely the management of the Batik Laweyan Development Forum. In the process of collecting risk data, researchers use a business framework that makes several aspects, namely risks in raw materials (input), production processes (process), and finished goods (output) (Santoso *et al.*, 2018).

3.2.1 Risk Measurement - Risk in Batik Laweyan

The measurement of risk was carried out using the Failure Mode and Effect Analysis (FMEA) method to determine the rating of each risk (Sandito *et al.*, 2022). This step involved determining the severity (S), occurrence (O), and detection (D) levels of each risk

by distributing questionnaires to predetermined respondents (Sharma and Srivastava, 2018). Then the calculation is carried out to find the value of the Risk Priority Number (RPN) can be determined based on the following equation 1:

$$RPN = (S)\ x\ (O)\ x\ (D) \quad (1)$$

Where S is Severity, O is Occurrence, and D is Detection. Based on the assessment result, three risk indicators have the highest RPN and need to be managed and solved soon (Rahmatin *et al*., 2018).

3.2.2. Rating and Risk Determination on Batik Laweyan

The ranking or sorting of the risks that have been previously identified is given a rating based on the results of the calculation of the value of the Risk Priority Number from the highest value to the lowest value can be seen in Table 2 below which has several criteria with a certain rating.

Table 2 Batik Laweyan Risk Rating

No	Criteria	Risk Type	RPN	Rank	Category
1	Raw Material (Input)	Risk of accumulation of raw materials	180	5	High
2		The risk of changes in the budget	216	3	Very High
3		The risk of changes in the price of raw materials Volatile	63	10	Low
4		The risk of delays in the supply of raw materials	45	12	Low
5		The risk of labor shortages	45	11	Low
6	Process Production (Process)	Risk of decreased quality	80	8	Medium
7		Risk of equipment damage	175	7	High
8		Risk of experiencing SOP changes due to new Normal	180	6	High
9		The risk of workers experiencing health problems	60	9	Low
10	Finished Product (Output)	Risk of falling demand	252	2	Very High
11		The risk of government policies regarding the implementation of PPKM	210	4	Very High
12		Risk of changes in consumer behavior	294	1	Very High

According to (Sharma and Srivastava, 2018), they are Ranking the highest order based on the risk with the highest RPN value. Based on the calculation of Table 2, the RPN value is the highest order and classified as very high risk. Namely, the risk of changes in consumer behavior is 294, the risk of decreasing demand is 252, the risk of changes in the cost budget is 216, and the risk of implementing PPKM is 210. After obtaining the level of risk in Batik Laweyan, alternative proposals are given to overcome the risks.

3.3. Determination of Alternative Risk Mitigation Strategies in Batik Laweyan

Mitigation strategies are set to mitigate risks based on expert considerations in this field, namely the parties from Batik Laweyan, namely the administrators of the batik.

Laweyan Development Forum in the business fund industry, research, and development sector. They involve several Batik owners in Laweyan, such as Batik Putra Laweyan, Batik Mahkota, Batik Loring Pasar, Batik Ozz, and Batik Ekru, and literature study on risks. The purpose of determining and developing this strategy is to minimize the occurrence of risks by reducing the occurrence of risks or reducing the impact caused by threats to Batik Laweyan.

3.3.1. Risk of Changes in Consumer Behavior

The business at Batik Laweyan is one of the businesses that is experiencing the risk of changing consumer behavior due to the COVID-19 pandemic. (Prakoso, 2020) states that

Consumer behavior refers to the decision-making process that consumers go through when buying and consuming a product. At Batik Laweyan, businesses have noticed a change in consumer behavior, as more consumers are opting to shop online and are also placing greater emphasis on health and hygiene concerns. In addition, consumers also want the products they buy to be free from the risk of exposure to COVID-19. To mitigate risk, there are several alternative strategies, namely consumer research and adapting to take advantage of technology optimally while realizing the digitization of MSMEs; utilizing social media as an attraction to buyers; conducting advertising with an educational context to support sales; and improving quality and service.

3.3.2. Risk of Declining Demand

During the COVID-19 pandemic that hit Indonesia, demand at Batik Laweyan experienced a significant decline. According to (Amri, 2020), demand means the consumer's desire to buy an item at various price variants during a certain period. One of the causes of the decline in demand is caused by the tastes or habits of the people that can affect the demand for an item. If people's appetite for an object increases, the demand for that item will also increase. To mitigate risk, there are several alternative strategies, namely conducting customer reviews on customer service, innovation, and product shifting. Producing products that are trending in the community and capable of being produced by MSMEs; and providing promotions and discounts on certain products.

3.3.3. Risk of Budget Changes

The pandemic resulted in the risk of changing the budget for Batik Laweyan. According to (Amri, 2020), during a pandemic, every business or business globally experienced a setback, and every company was forced to be able to change its cost budget and start switching and adapting to the pandemic so that the company could ensure the continuity of the company could continue to survive. To mitigate risk, there are several alternative strategies, namely delaying expansion, cutting the workforce to make it more efficient, as well as improvement and improving cost control in the production and purchase of raw materials in a more structured manner.

3.3.4. Risks of Implementing PPKM

PPKM (Pemberlakuan Pembatasan Kegiatan Masyarakat) or Enforcement of Restrictions on Community Activities, hurts Batik Laweyan's business because Batik Laweyan's business is daily, which must rely on direct interaction with consumers. So that the implementation of PPKM makes the business at Batik Laweyan less than optimal in marketing its products, even consumer demand. To mitigate risks, there are several alternative strategies available. These include utilizing E-commerce as a digital sales market and digital marketing as a means of promoting products. Another strategy is to conduct virtual events to market products. Additionally, businesses could consider restructuring their systems and focusing on the local target market during PPKM.

3.4. Calculation *of Determination of Alternative Risk Mitigation Strategies*

The appropriate alternative strategy is then selected based on the predetermined risk mitigation strategy alternatives. After determining alternative strategies to overcome risks, AHP data processing is carried out to choose alternative methods (Djunaidi *et al*., 2019). Based on the calculations made from the results of the questionnaire assessment, the value of each criterion and an alternative strategy were obtained. The hierarchical structure and the results of calculating the weight of the requirements and alternative methods obtained can be seen in the hierarchical structure of risk minimization of Batik Laweyan during the COVID-19 Pandemic in Figure 1.

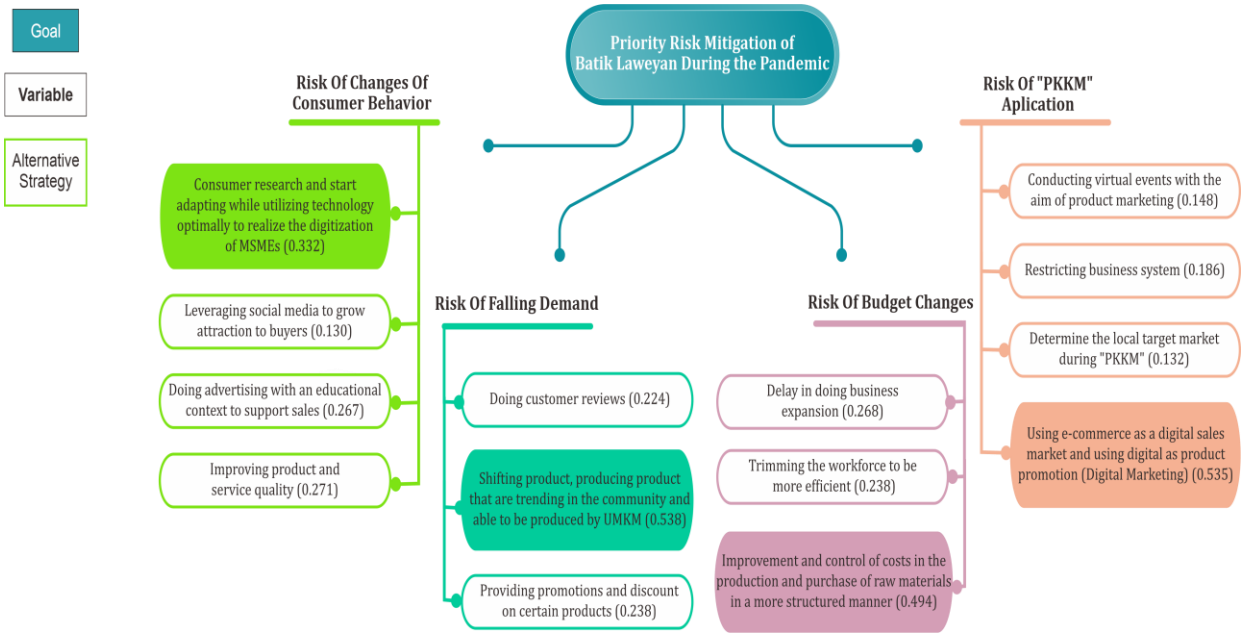

Figure 1 Hierarchical Structure in Batik Laweyan

The AHP method calculates that the consistency ratio (CR) value for the risk of changes in consumer behavior is 0.0123, the risk of decreasing demand is 0.0055, the risk of budget changes is 0.0011, and the implementation of PPKM is 0.0257. The CR value obtained in the calculation for each level is below or less than 0.1. According to (Muslim, Riansa, and Komarudin, 2017), these results show that the CR value is 0.1, which means the degree of consistency of the calculation is good and does not need to be recalculated.

Based on the AHP calculation, priority weights for risk mitigation can be determined, as shown in Figure 1. The following risk mitigation strategies have been identified as having high importance and should be immediately implemented by Batik Laweyan:

a. Innovation and product shifting, producing products that are trending in the communityand can be made by Micro, Small and Medium Enterprises (MSMEs), the weight value is 0.538. Innovation is significant in business competition (Rajapathirana and Hui, 2018). The invention aims to improve and increase the value of a product so that it is different from other products from the consumer's point of view (Kanagal, 2015). Innovation capabilities are needed to direct organizations to develop continuous innovation to respond to changing market environment (Slater, Hult, and Olson, 2010). The current pandemic conditions have changed customer behavior in buying goods (Agus *et al*., 2021). Product Shifting is done so that a business can earn income by producing products that are trending in society (Rosita, 2020). Batik Laweyan can take advantage of people working from home by issuing products that consumers often use while working from home comfortably and are guaranteed to be free from COVID-19.
b. Utilizing e-commerce as a digital sales market and digital as product promotion (Digital Marketing), the weight value is (0.535). Digital marketing is using digital media or the internet to carry out marketing activities or promote brands or products. Elements of digital marketing include online advertising, email marketing, social media, text messaging, affiliate marketing, search engine optimization (SEO), and pay-per-click (PPC) (Yasmin, Tasneem, and Fatema, 2015). The purpose of digital marketing is to quickly attract consumers and potential customers (Alfrian and Pitaloka, 2020). Many in Batik Laweyan are not used to using online marketing models (e-commerce). With the pandemic and the implementation of PPKM, Batik Laweyan must adapt because,

nowadays, the online system is one of the strengths of MSMEs, so their products are widely absorbed by the public and digitally. It is one of the most effective and readily accepted advertising media by consumers, and digital use is essential in promoting products that will be sold to consumers. An effective marketing strategy and precise use of technology enable companies to identify product trends, determine the right marketing strategies, and improve sales cycles (Desai, 2019)

c. Improvements and cost control in the production and purchase of raw materials are more structured, with a weighted value of 0.494. MSMEs need to adjust efficiency and use of costs in the cost of raw material supplies, production costs, and balance to product prices (Irawan, Santoso, Mustaniroh, 2017). The efficient use of natural materials can reduce production costs (Wellmer and Hagelüken, 2015). The cost of raw materials has been fluctuating due to uncertain market demand each month. One of the strategies adopted by Batik Laweyan to overcome this is to change their production system. The company has transitioned from a make-to-stock system to a make-to-order system. The characteristic of the make-to-order system is that production begins when the product has been ordered in advance and is adjusted at the customer's request (Saniuk and Waszkowski, 2016). Another strategy that can be applied is changing the pattern of the Batik Laweyan worker system by using a weekly work shift system, rotating workers each week to minimize costs in production and purchasing of raw materials while optimizing sales promotions that have taken place.

Consumer research and adaptation to take advantage of technology optimally while realizing the digitization of MSMEs, the weight value is 0.332. The pandemic has dramatically changed consumer behavior, and the MSME Batik Laweyan must also immediately conduct consumer research caused by the pandemic. According to Alfrian and Pitaloka (2020), consumer research is the process of identifying customer behavior, preferences, and motivations when purchasing products or services. Batik Laweyan needs to conduct consumer research to determine the community's needs, how services can be provided under pandemic conditions, and how to utilize technology to improve sales efficiency. Batik Laweyan needs to implement a Customer Relationship Management system, a business strategy that combines processes, people, and technology to attrac potential customers, turn them into customers, and retain existing customers. Technology can make a system in a business run effectively and efficiently without having to spend too much money to survive and develop while realizing the digitization of MSMEs (Marlina, 2020).

4. Conclusions

Based on the results of data processing, it can be concluded that from data processing using the FMEA method, 12 risks are obtained, which include several aspects, namely: aspects of raw materials, four risks, aspects of the production process, five risks and aspects of product risk three risks, with the priority risk of each factor being the risk of change. Consumer behavior is 294, the risk of decreasing demand is 252, the risk of budget changes is 216, and the risk of government policies related to PPKM is 210. Meanwhile, the calculation to mitigate the risk is developing 14 alternatives and choosing priority mitigation strategies with AHP. The alternative mitigation strategies chosen for each risk factor are the risk of changing consumer behavior, consumer research choice strategies, and starting to adapt to optimally utilize technology while realizing the digitization of MSMEs with a value of (0.332), the risk of decreasing demand for selected alternative innovations and product shifting, resulting in products that are trending in the community

and can be made by MSMEs with a value of (0.538), the risk of changes in the selected cost budget for alternative improvements and cost control in the production and purchase of more structured raw materials with a value of (0.494), and the risk of implementing the selected alternative strategy of PPKM using e-commerce as a digital sales market and utilizing digital as product promotion (Digital Marketing) with a value of (0.535). This study has provided ways to reduce risk. However, this study has not discussed the relationship between risk mitigation and more technical matters, such as whether to build e-commerce or use an existing platform, which platform is suitable for Batik Laweyan's conditions, and how to use e-commerce. Future studies could discuss the relationship between risk mitigation and the implementation of risk mitigation.

References

Agus, A.A., Yudoko, G., Mulyono, N., Imaniya, T., 2021. E-Commerce Performance, Digital Marketing Capability and Supply Chain Capability within E-Commerce Platform: Longitudinal Study Before and After COVID-19. *International Journal of Technology*, Volume 12(2), pp. 360–370

Akseer, N., Kandru, G., Keats, E.C., Bhutta, Z.A., 2020. COVID-19 Pandemic and Mitigation Strategies: Implications for Maternal and Child Health and Nutrition. *American Journal of Clinical Nutrition*. *American Journal of Clinical Nutrition*, Volume 112(2), pp. 251–256

Al-Doori, J.A., Khdour, N., Shaban, E.A., al Qaruty, T.M., 2021. How COVID-19 Influences the Food Supply Chain: An Empirical Investigation of Developing Countries. *International Journal of Technology*, Volume 12(2), pp. 371–377

Alfrian, G.R., Pitaloka, E., 2020. Strategies for Micro, Small and Medium Enterprises (MSMEs) to Survive the Covid 19 Pandemic Conditions in Indonesia. In *National Seminar on Applied Innovative Research (SENTRINOVE)*, Volume 6(2), pp. 139–146

Amri, A., 2020. The Impact of COVID-19 on MSMEs in Indonesia. *Brand Journal*, Volume 2(1), pp. 123–130

Berawi, M.A., Suwartha, N., Kusrini, E., Yuwono, A.H., Harwahyu, R., Setiawan, E.A., Yatmo, Y.A., Atmodiwirjo, P., Zagloel, Y.T., Suryanegara, M., Putra, N., Budiyanto, M.A., Whulanza, Y., 2020. Tackling the COVID-19 Pandemic: Managing the Cause, Spread, and Impact. *International Journal of Technology*, Volume 11(2), pp. 209–214

Candra, S., Ayudina, M., Arashi, M. A., 2021. The Impact of Online Food Applications during the COVID-19 Pandemic. *International Journal of Technology*, Volume 12(3), pp. 472–484

Cunningham, S., McCutcheon, M., Hearn, G., Ryan, M.D., 2021. 'Demand' for Culture and 'Allied' Industries: Policy Insights from Multi-Site Creative Economy Research. *International Journal of Cultural Policy*, Volume 27(6), pp. 768–781

Desai, D.M., 2019. Digital Marketing: A Review*. International Journal of Trend in Scientific Research and Developmen*t, Volume 5(5), pp. 196–200

Djunaidi, M., Kumaraningrum, V.S.D., Pratiwi, I., Munawir, H., 2019. Integration of 360-Degree Feedback Methods and AHP for Employee Performance Measurement. In: *Proceeding of The International Conference on Industrial Engineering and Operations Management,* Volume 2019, pp. 2616–2623

Ganguly, K.K., Kumar, G., 2019. Supply Chain Risk Assessment: A Fuzzy AHP Approach. *Operations and Supply Chain Management*, Volume 12(1), pp. 1–13

Hasibuan, R.P.P.M., Ashari, A., 2020. Optimization of the State's Role in Facing the 2019 Corona Virus Disease Pandemic in the Perspective of Emergency Constitutional Law. *SALAM: Social and Cultural Journal of Syar-I*, Volume 7(7), pp. 581–594

Irawan, J.P., Santoso, I., Mustaniroh, S.A., 2017. Model Analysis and Mitigation Strategy of Risk in Tempe Chips Production. *Industria*: *Journal of Agroindustrial Technology and Management*, Volume 6(2), pp. 88–96

Kanagal, N.B., 2015. Innovation and Product Innovation in Marketing Strategy. *Journal of Management and Marketing Research*, Volume 18, pp. 1–25

Kayı, İ., Sakarya, S., 2020. Policy Analysis of Suppression and Mitigation Strategies in the Management of an Outbreak Through the Example of COVID-19 Pandemic. *Infectious Diseases and Clinical Microbiology*, Volume 2(1), pp. 30–41

Marlina, L., 2020. MSME Opportunities and Challenges in Efforts to Strengthen the National Economy in 2020 Amid the Covid 19 Pandemic. *Economic Journal*, Volume 22, pp. 118–124.

Muslim, E., Riansa, I., Komarudin, 2017. Analytic Hierarchy Process (AHP) Pairwise Matrix with One Missing Value. *International Journal of Technology*, Volume 8(7), pp. 1356–1360

Muslimah, E., 2020. Waste Reduction in Green Productivity in Small and Medium-Sized Enterprises of Kampoeng Batik Laweyan. *International Journal of Emerging Trends in Engineering Research*, Volume 8(6), pp. 2360–2364

Muslimah, E., Wais, K., Rifai, M.A., Soeparman, S., Yanuwiyadi, B., 2021. How Green Ergonomic Meet Eco-Efficiency in The Batik Industry*. ARPN Journal of Engineering and Aplied Sciences*, Volume 16(9), pp. 979–986

Oktiarso, T., Nadira, A.H.K., 2019. Risk Mitigation for Agricultural Products Distribution in Agro-business Terminal Mantung, Kabupaten Malang. *IOP Conference Series: Materials Science and Engineering*, Volume 528(1), p. 012087

Pakpahan, A.K., 2020. COVID-19 and Implications for Micro, Small and Medium Enterprises. S*cientific journal of international relations*, Volume 20, pp. 1–6

Prakoso, F., 2020. Impact of Coronavirus Diseases (COVID-19) on the Food & Beverages Industry. *Journal of Business Management*, Volume 33, pp. 1–6

Rahmatin N., Santoso, I., Indriani, C., Rahayu, S., Widyaningtyas, S., 2018. Integration of The Fuzzy Failure Mode and Effect Analysis (Fuzzy FMEA) and The Analytical Network Process (ANP) in Marketing Risk Analysis and Mitigation. *International Journal of Technology*, Volume 4, pp. 809–818

Rajapathirana, R.P.J., Hui, Y., 2018. Relationship Between Innovation Capability, Innovation Type, and Firm Performance. *Journal of Innovation and Knowledge*, Volume 3(1), pp. 44–55

Rosita, R., 2020. The Effect of the COVID-19 Pandemic on MSMEs in Indonesia. *Jurnal Lentera Bisnis*, Volume 9(2), pp. 109–120

Sandito, A.R., Rahma, D.N., Tyastuti, N.U., Putri, A.S., 2022. Supply Chain Risk Management in Newspaper Printing Using FMEA and FTA Methods: A Case Study. In: *Proceedings of the International Conference on Industrial Engineering and Operations Management*, pp. 3003–3012

Saniuk, A., Waszkowski, R., 2016. Make-to-order Manufacturing - New Approach to Management of Manufacturing Processes. *IOP Conference Series: Materials Science and Engineering*, Volume 145(2), p. 022005

Santoso, I., Sa'adah, M., Sari, E.N., Prameswari, P.A.I., Agustina, C.R., 2018. The Integration of MAFMA and AHP Methods for Analysis and Risk Mitigation of Pasteurized Milk Production. *Journal of Engineering and Technological Sciences*, Volume 50(5), pp. 671–684

Setyanto, A.R., Samodra, B.R., Pratama, Y.P., 2015. Study of MSME Empowerment Strategies in Facing Free Trade in the ASEAN Region (Case Study of Kampung Batik Laweyan). *Etikonomi*, Volume 14(2), pp. 205–220

Sharma, K.D., Srivastava, S., 2018. Failure Mode and Effect Analysis (FMEA) Implementation: A Literature Review. *Copyright Journal of Advance Research in Aeronautics and Space Science*, Volume 5(2), pp. 2454–8669

Slater, S.F., Hult, G.T.M., Olson, E.M., 2010. Factors Influencing the Relative Importance of Marketing Strategy Creativity and Marketing Strategy Implementation Effectiveness. *Industrial Marketing Management*, Volume 39(4), pp. 551–559

Suci, Y.R., 2017. Development of MSME (Micro, Small and Medium Enterprises) in Indonesia. *Jurnal Ilmiah Cano Ekonomos,* Volume 6(1), pp. 51–58

Wellmer, F.W., Hagelüken, C., 2015. The Feedback Control Cycle of Mineral Supply, Increase of Raw Material Efficiency, and Sustainable Development. *Minerals*, Volume 5(4), pp. 815–836

Yasmin, A., Tasneem, S., Fatema, K., 2015. Effectiveness of Digital Marketing in the Challenging Age: An Empirical Study. *The International Journal of Management Science and Business Administration*, Volume 1(5), pp. 69–80