Risk Mitigation Analysis And Strategy Of Product Development Processes In The Textile Industry (Case Study: Hijab Trader At Balikpapan Center)

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Abstract. Quality control is a system and activities to ensure quality standards in accordance with planned specifications. Quality control is also one of the important things that can affect the company's image for consumers. Balikpapan center is one of the biggest shopping centers in Balikpapan, East Kalimantan, at present there are 37 hijab traders on the same floor, resulting in trade competition. A good strategy is needed to be able to sell comfortably, where this strategy will minimize the risks that can arise. One method used is failure modes and effects analysis (FMEA). The use of FMEA can be used to identify risks and risk factors and obtain the value of potential failure, so that the greatest failure risk experienced by traders can be identified. The purpose of this research is to analyze the failure factors in the hijab industry, use the FMEA method, determine the risk of failure value in the risk priority number (RPN), and provide improvement plans for traders. The results showed that there were 3 risk classifications, 12 risk factors, and 15 risk mitigation strategies.

Keywords: Risk, strategy, FMEA, RPN

1. Introduction
The textile industry is one of the industries that has always been a national priority and has high prospects for growth [4]. Evidently, the textile and textile product (TPT) industry had a growth of 7.5% in 2011 and was able to absorb a workforce of 3.8 million in 2012 [2]. The challenge of this industry is the novelty of creating products that follow the era and improving the quality of its products. This was also agreed with the abolition of the Multy Fiber Agreement (MFA; textile quota regulation) policy in 2005. In Indonesia, the TPT market potential is still very large, with per capita consumption levels reaching 4.5 kg in 2010, which means that it is equivalent to the need for national clothing which reaches 1.13 million tons of clothing (Indonesian Textile Association,
2012). And based on data from the Indonesian Ministry of Trade in 2008, the consumption of the textile subsector to the gross domestic product (GDP) of the creative industry in Indonesia, which was the largest came from the fashion sector by 44%, followed by handicrafts 23% and finally in the performing arts 0.15%.

The fashion industry is one of the largest creative industries in mapping the creative economy in Indonesia, where at this time fashion in Indonesia is not only seen as a dress necessity but also as a cultural identity and self-character. This is very relevant to government programs that want to develop industries and experience economic improvement. Fashion cycles change from time to time, this rapid change results in fluctuating market demands, short life cycles, and uncertain market needs. To overcome this, a fashion industry must have characteristics that can be applied in various models and have a new product development process as a basis for failure analysis in the market.

In the fashion industry it is very important to implement risk management, where this system will be able to improve prices, production scheduling, and which can affect the success of new product development. Based on the urgency above, researchers feel the need for research on risk analysis at all stages of business process in the fashion industry. Based on this background the researcher wants to examine the risk analysis that arises in the hijab trade business at the Balikpapan Center, so that the hijab traders can minimize the risks that might arise, and have a good strategy in developing their business. In minimizing risk, proper quality control is needed in order to obtain products that meet consumer desires. One method to help control quality is Failure Modes and Effects Analysis (FMEA), a method commonly used to evaluate failures that occur in production, design, process, or service systems. To identify potential failures we must provide a score for each failure mode based on its incidence rate (occurrence), severity (severity), and detection rate (detection) [3].

Balikpapan center is the biggest shopping center in this city. There are 3 floors that sell various kinds of clothing, and there is one floor that specializes in selling hijab. There are approximately 37 hijab traders with almost the same product variations and prices. Such conditions create fierce competition in terms of marketing their products, resulting in the emergence of risk. From the survey results, 3 risk classifications were found, and 12 risk factors are described in Table 1. Based on the risk factors found, it is necessary to determine the highest risk factor in order to be minimized. Based on these problems, it is necessary to identify the cause of failure that has a significant impact, using Failure Mode and Effects Analysis (FMEA).

Table 1. Risk Classification and Risk Factors in Balikpapan Center

| Risk Classification | Risk Factors               |
|---------------------|---------------------------|
| Financial           | Financial Risk            |
| Management          | Communication risk        |
|                     | Requirement               |
|                     | Workforce                 |
|                     | Management Risk           |
| Marketing           | Demand                    |
|                     | Sales                     |
|                     | Competitor risk           |
|                     | Customer                  |
|                     | Market risk               |
|                     | Product cost              |
|                     | Advertising               |
2. Methodology

This research begins with the risk identification and risk evaluation stages. Risk management framework process is adopted from [1], which will be processed using FMEA. The risk identification stage is determined by identifying all risk factors (risk factors), risk events (risk events), causes of risk (risk agents), impact (severity) and opportunities (probability) based on business processes that consist of 3 categories: financial, management and marketing categories. All data is validated by company experts (owner). In the process of risk analysis and evaluation, an RPN (Risk Priority Number) calculation is performed using FMEA which functions to determine the priority causes of risk in all business processes. NRP obtained from severity, occurrence, and detection multiplication will be used as the basis for forming a new strategy for hijab traders in Balikpapan Center.

2.1 Severity

Severity is an assessment of the seriousness of the effect that appears. Every failure that arises will be assessed on how serious it is. So that the greater the effect that appears, the greater the severity.

2.2 Occurrence

Occurrence is the possibility that such causes will occur and result in a form of failure during the life of the product. Occurrence is a rating value that is adjusted to the estimated frequency and or cumulative number of failures that can occur.

2.3 Detection

The detection value is associated with the current control. Detection is a measurement of the ability to control / control failures that can occur.

3. Risk Priority Number (RPN)

RPN is the product of the multiplication of severity, occurrence, and detection levels. The RPN value is used to rank potential process failures. The RPN value is indicated by the following equation:

\[ RPN = \text{severity} \times \text{occurrence} \times \text{detection} \]

(1)

4. Research Finding

The observation of existing conditions in medium-sized businesses shows that they have never applied risk management to their business. Thus impacting on the difficulty of business owners to develop their business processes. From the results of interviews and observations, we found the potential failure in Table 2, and the RPN results in Table 3.

| Table 2. Potential Failure in The Hijab Business at Balikpapan Center |
|---------------------------------------------------------------|
| Risk Classification | Risk Factors          | Potential failure modes                        |
| Financial          | Financial risk        | Product costs over budget                      |
|                    |                      | Revenue is not on target                      |
| Management         | Communication risk    | Communication with other tenants               |
|                    | Requirement           | Communication with customers                   |
|                    | Workforce             | Changes in shopping center management          |
|                    |                      | Product similarity between tenants             |
|                    |                      | A team that is not competent in their field    |
|                    |                      | Low employee commitment                       |
Management risk

- Management is not going well
- New products that are released late

Demand
- Demand is higher than production capacity
- Demand variant is uncertain

Sales
- Target not reached
- The sales force is not able to run marketing

Competitor risk
- Failure to anticipate competitors
- Price war between competitors

Customer risk
- Customer needs change very quickly
- Existing products do not meet the needs and desires of customers
- Choose a store that is easily visible
- Choose a big shop

Market risk
- Unsold product
- Changes in consumer tastes in a short time
- Incomplete price and spec information

Product cost
- Selling price is not competitive

Advertising
- Unsold products for a long time
- Advertising failure
- Expensive advertising costs

| Potential failure modes                        | RPN Score | Proposed Improvement                                                                 |
|------------------------------------------------|-----------|--------------------------------------------------------------------------------------|
| Choose a store that is easily visible          | 360       | Re-layout of sales locations in shopping centers                                     |
| Choose a big shop                              | 256       | Evaluate the effectiveness of sales promotions                                        |
| Changes in shopping center management          | 180       | Improved communication through the project                                             |
| Existing products do not meet the needs and desires of customers | 168 | Build effective communication with customers to get feedback |
| Unsold product                                | 168       | Analyze external factors (competitors, customers) and understand customer feedback     |
| Customer needs change very quickly            | 135       | Market research aims to increase product value from a customer perspective             |
| Changes in consumer tastes in a short time     | 98        | Market research aims to increase product value from a customer perspective             |
| Product similarity between tenants             | 96        | Good arrangement of marketing channels                                               |
| The sales force is not able to run marketing  | 84        | Increased employee motivation through bonus rewards for outstanding employees and regular training of sales staff |
| Selling price is not competitive | 84 | Evaluate pricing strategies compared to competitive products and prices |
|-------------------------------|----|--------------------------------------------------------------------------|
| Demand is higher than production capacity | 72 | Market research aims to increase product value from a customer perspective |
| Demand variant is uncertain | 50 | Market research aims to increase product value from a customer perspective |
| Low employee commitment | 40 | Increased employee motivation through bonuses for money or holidays, staff training, career advancement, rewards for employees who excel |
| New products that are released late | 32 | Improve marketing capabilities and utilize social media to sell products |
| Failure to anticipate competitors | 32 | Able to read market desires, and create trends |

After getting a ranking from the RPN inside the FMEA process that is giving proposed improvements to the failure mode that has been ranked in order priority. It aims to improve quality control at the moment in the company. Proposed improvements are not only given to the value at above 100, but all modes of failure are already identified as being proposed to be fixed as material for consideration for the company. In Table 2 already known priority order so it is necessary proposed further improvement. Proposal improvements are made based on the order priorities can be seen in Table 3.

Based on Table 3 above it can be seen that found a critical risk agent in the management category related to management of a third party, namely the manager of the shopping center. This risk agent occurs if suddenly there are regulations that change, usually related to operating hours and changes in rental prices. The mitigation pattern is in the form of increased communication through the project, so that if there is a change in policy, it will not harm all parties because of the discussion beforehand.

In the marketing category found a critical agent with the highest RPN value is the selection of stores that are easily visible. The mitigation pattern is to re-layout the selling position, so that all stores can be seen by customers. This mitigation is quite difficult to implement because it costs a lot, so it is still difficult to be approved by the shopping center management. According to Hermawan Kertajaya, the application of a good risk mitigation strategy is if it still refers to the marketing mix, namely:

- **Products**: Hijab traders in Balikpapan Center already have specific products, with a clear target market. Distribution of products that are almost the same in every store, is actually an added value, because it gives the impression that to get the desire customers do not need to look far away from where they are now
- **Place**: Provide a convenient place to shop that reaches all walks of life
- **Price**: Hijab prices offered at this shopping center are affordable and in accordance with the quality of the product
- **Promotion**: Merchants are advised to create an association to do promotions regularly through social media. Service / hijab class, veil demo, reseller discount, and product arrangement to be more easily seen by customers.
Summary
Product quality control is an important process in business continuity. Quality control and risk management cannot be separated, because to improve a quality, then a company must disappear the risks that might arise. However, small and medium-sized industries, including the hijab industry, focus more on the large number of products sold. They are still considered not implementing risk management due to limited knowledge. This research found that 3 risk classifications, 12 risk factors, and 15 risk mitigation strategies. The biggest risk agent is about management, where the thing to note is the layout between tenants. The current layout is implemented, the less comfortable, especially the more products that are sold. For future research, this research can be developed to the analysis stage of a mitigation strategy that includes all risk agents occurring at each stage. In addition, for further research it is necessary to add case studies on research subjects involving shopping center management.

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