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# Keys Success Factor in Innovation Development for Fish Product Export Oriented in Fishery Industry Central Java Province

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**Abstract.** The innovation of fish product development will increase the added value of the product so that the product will have a competitive advantage and become a market leader. Innovation will bring an impression as a new product so that consumers will look for it. The strategy to increase exports of fish products through product development innovations is expected to maintain the existing market and continue to increase its coverage. The aim of the study was to conduct an innovation analysis of the development of e-export oriented fish products with assessment variables including: innovation, inhibiting factors and supporters using the 4P approach (Product, Place, Price, Promotion), FCP (Five Competitive Forces) and VRIO (Value, Rareness, Imitational, Organizational). The analytical method was used the Composite Performance Index (CPI), which is the merging of the weight values then ranking. Analysis the decision-making system is based on an assessment by experts in this case the stakeholders of export of fish products. Decision-making systems based on innovation parameters (weighting criteria 0.4), supporting factors (weighting criteria 0.3) and inhibitors (weighting criteria 0.3). The highest score that becomes the first level that determines the success of export-oriented fish products exports on the elements specified in the study are elements of 4P, FC F and VRIO, each of which is 'promotion' (score 131.5), 'customer control' (score 116.8) and 'value' (score 113.8).

**Keywords:** Innovation, fish products, Composite Performance Index

## 1. Introduction

Fishery product processing industry in Central Java Province (CJP) in the last five year continues to show improvement. Fish processed products from CJP are able to penetrate the world market including Europe, America, Australia and Asia. The existing fishery autonomy in CJP, both capture fisheries, fresh water cultivation, and brackish water cultivation is directed at processing export-oriented products. The American and European markets are an important market for Indonesian fishery products. So far, the American and European Union markets have become barometers of world markets [1, 2]. They apply strict requirements for a variety of products that enter in this service area. This means that fish products from Central Java Province which entering Europe have fulfilled the quality and food safety requirements. Fishery commodities from CJP were to penetrate export markets processed by the Fish Processing Unit (UPI) modern.

Based on data [3], the export value of Central Java Province in August 2017 reached US \$ 562.99 million or an increase of 12.77 percent compared to exports in July 2017 (US \$ 499.23 million). Likewise, when compared to August 2016 (year on year) Central Java exports rose by US \$



113.81 million (25.34 percent). Cumulative exports from January to August 2017 reached US \$ 3,918.84 million, up 10.96 percent from cumulative exports from January to August 2016 (US \$ 3,531.77 million). The number of human resources involved in the fishery processing business reached 12,145 people spread over 381 UPI. The average production volume of fishery processing products in Central Java Province during 2013-2016 increased by 11.20 %. Centre fisheries products in Central Java are spread in Pati, Rembang, Jepara, Kudus, Pekalongan, Pemalang, Tegal, Brebes and Semarang Regencies.

The fishing industry in CJP is consisting of several scales, namely small-medium micro enterprises with local market segments, and modern industries that have export market segments. In addition the processing also varies, from, fumigation, presto, and crackers. The superior products were produced include filet tilapia, frozen fish, sardines, crab meat, and shrimp crackers. The development of the fisheries industry is measured through the level of the technological development [3, 4]. The abundance of these resources indicates that the CJP has considerable potential to be developed into a modern processing industry center in Indonesia. Some of the problems include processing equipment at unit fish processors in small is still inadequate (wall of bamboo, the floor was still soil), water supplies less (relying on the supply of water from the river) and the availability of raw materials is still not stable.



**Figure 1.** Map of Central Java [5]

In terms of its location, Central Java Province is a strategic area in the economic field and has the potential of natural resources and human resources that can be developed. The marine and fisheries sector in CJP have an important and strategic role in regional and national economic development, especially in increasing the expansion of employment opportunities, income distribution, and improving the standard of living of fishermen in the fisheries business sector. In order to improve the development of innovation in export-oriented fishery products, it requires a key success factor that can provide insight to all policyholders and stakeholders.

By innovating, the fishing industry in Central Java expected to create a different product and have a new breakthrough. By making product innovations are to be accepted by the new market [6, 7]. Innovation development which is successful in fishery products, which based on the results of research on the key to success, it will be the right strategy to win the competition in the international market. Product development innovations should be designed together with marketing mix orientation [8]. The environment will influencing element the company's success in facing the pressure and ability of an industry's competitiveness as the Five Competitive Forces (FCF) Framework theory and the changes caused by changes in external factors of the company. Innovation performance is key success factor in building industry competitiveness [8, 9, 10, 11, 12, 13].

### *Research Problem*

By the background above the problem in this study is how to determine and analyze factors most influential in development of innovation and competitiveness in the fisheries industry in Central Java Province.

### *Research purposes*

1. Determine the most influential factors in deciding the innovation of fishery products.
2. Analyze the most influential factors in each of the 4Ps, VRIO, FCB theory concepts that can be used as decision making in determining long-term development strategies.

## **2. Literature Review**

### *The VRIO Framework [14]*

Internal conditions of the company are often used as a basis in determining the strengths and weaknesses of the company. Further analysis of this condition will provide how much resources the company which can provide a sustained advantage, which is temporary and which is the disadvantage

The analytical tool for knowing these conditions is VRIO (Valuable, Rare, Imitate to Cost and Organized). [14, 15] stated that VRIO can be used to see a comparative study of strengths and weaknesses in the company's internal conditions. VRIO framework analysis evaluates aspects: Valuable, Rare, Imitate Costing & Organizing exploit resources. VRIO testing and evaluation based on questions for each condition, namely:

1. Valuable; do these conditions encourage companies to use external opportunities and neutralize external threats?
2. Rare; are these conditions only controlled by a small number of companies or rarely owned by other companies?
3. Imitate to Cost, are these conditions difficult for other companies to replicate or replicate?
4. Organized; are these conditions supported and managed by the company appropriately?

### *The 4P Framework [16]*

Marketing mix is a combination and four variables that are the core of the company's marketing system and can be controlled by the company as effectively as possible [13,16]. To win the competition, every company needs a good strategy. Especially in the field of marketing is something that is very important in a company.

The marketing mix must always be dynamic, always able to adjust to the external and internal environment. External factors are factors beyond the reach of the company which includes competitors, technology, government regulations, economic conditions, and socio-cultural environment. Internal factors are the variables including; the marketing mix, namely: Product, Price, Place, and Promotion.

These variables can be grouped into four main groups known as 4 p's, namely:

1. Product (Product)
2. Price (price)
3. Promotion (Promotion)
4. Place

### *The FCB Framework [8]*

The competitive environment is always regarded as a driving factor as well as a barrier to industrial growth rates. Therefore, how the industry determines its attitude and responds to it. The response to the competitive environment can encourage creativity because it requires knowledge of how the competitive environment conditions and the latest innovation needs. All the factors that support the opportunity to innovate and weaknesses can be an obstacle to be reckoned. Innovation is an interactive process by looking at the network of FCB relationships including changes in resources.

**Table 1.** Assessment system of FCF strength [17]

FCF	Factors
Supply control	1. Product uniqueness 2. Raw material access 3. Market network 4. Infrastructure assets
Rivalry control	1. Competitive strategy 2. Competition advantage 3. Value chain evaluation 4. Adaption to regulations
Customer control	1. Customer basis 2. Customer control 3. Access to markets 4. Distribution control
Entry protection	1. Brand protection 2. Adaption market trends 3. Advantage against new entrants 4. Sufficient capital to grow
Substitute protection	1. Market segmentation 2. Innovation protection 3. competitive prices 4. Product protection

The point is actually Porter considers that the company does not only compete with companies in the industry today. The analysis commonly used by a company which the company's direct competitor and finally they are trapped in a "competitor-oriented," so they do not have a clear market vision. In the five forces model, it is described that we also compete with our potential competitors, namely those who will enter, suppliers or suppliers, buyers or consumers, and producers of substitute products. Thus, we must know that five forces determine the characteristics of industry, namely:

1. Intensity of competition between existing players,
2. Threat of entering newcomers,
3. Bargaining power of suppliers,
4. The bargaining power of the buyer
5. Threat of substitute products.

### 3. Research Framework

Decision-making system is the development of management information systems in decision making, by simplifying or drawing conclusions from multiple criteria that are used as parameters in supporting decisions. Alternative decisions as the main parameters must be determined in order to produce the right decision and then a multiple criteria analysis is carried out. Method composite performance index (CPI) is a method based decision performance using heterogeneous criteria [18].

CPI Is a composite index (Composite Index) that can be used to determine an assessment or ranking of various alternatives (i) based on several criteria (j). The formula used in the CPI technique :

$$\begin{aligned}
 A_{ij} &= X_{ij} (\min) \times 100 / X_{ij} (\min) \\
 A_{(i+1,j)} &= (X_{(i+1,j)}) / X_{ij} (\min) \times 100 \\
 I_{ij} &= A_{ij} \times P_j \\
 I_i &= \sum_{j=1}^n (I_{ij})
 \end{aligned}$$

Information:

- $A_{ij}$  = the alternative value of the i in the j criteria  
 $X_{ij} (\min)$  = the alternative value of the i to the minimum initial criteria for j  
 $A_{(i+1,j)}$  = the alternative value of i + 1 on the j criteria  
 $X_{(i+1,j)}$  = alternative value to i + 1 in the initial criteria - j

- $P_j$  = the importance of the  $j$  criteria  
 $I_{ij}$  = alternative index  $i$   
 $I_i$  = index of combined criteria for the alternative to the third  
 $I$  = 1, 2, 3, ...,  $n$   
 $j$  = 1, 2, 3, ...,  $m$

#### 4. Research Method

This research was conducted to find out the key success factors needed in fisheries export to become one of the modern fishing industry countries. The research was carried out by field survey methods, direct interviews with business actors, related agencies and literature studies. Respondents were chosen proportionally to represent the type of processor, namely the group or individual to obtain comprehensive data. The results of observations in the field and interviews were compared with secondary data.

Data collected in the export-oriented fish product development research innovation is primary data through interviews using structured questionnaires with expert respondents (stakeholders) in processed fish exports in Central Java, consisting of managers in the fishing industry, fisheries exporters/entrepreneurs, fisheries service offices and certification bodies.

CPI assessment procedures are carried out with several provisions. First, identify the criteria for positive trends (the higher the value, the better) and the negative trend (the lower the value the better). In the positive trend criteria, the minimum value for each criterion is transformed into one hundred, while the other values are transformed proportionally higher. Whereas for the negative trend criteria, the minimum value for each criterion is transformed into one hundred, while the other values are transformed proportionally lower. The results of the transformation of the value are then multiplied by the value of the criteria weight and the results of the assessment of all criteria are added. Decision making is based on the ranking of values.

In this study, there were 12 variables as primary data which were further analyzed. Primary data is obtained directly from the distribution of questionnaires to the target respondents in the City and District around Central Java Province. Innovation assessment for export-oriented product development based on 4P, FCF and VRIO criteria are determined based on the innovation rating score of 1-10 with a weight of 0.4, supporting factors of export score 1-10 with a weight of 0.3, and export inhibiting factors score 1-10 with weights 0.3. The elements of innovation and supporting factors are positive trend criteria, while the inhibiting factors are negative trend criteria.

#### 5. Results And Discussion

##### 5.1 The 4P s

**Table 2.** The initial matrix for evaluating the development of export-oriented fish products based on 4P criteria

4P element	Innovation	Supporter	Inhibitor
Product quality	8	8	7.8
Place in Market	7.2	7	7.2
Price Offered	6.6	6.8	6.6
Promotion effort	8.2	8	7.6
C value theory	0.4	0.3	0.3

**Table 3.** Transformation matrix through a 4P performance index comparison technique

4P element	Innovation	Supporter	Inhibitor	Total Value	Rating
Product quality	121.2	117.6	84.6	129.4	2
Place in Market	109.1	102.9	91.7	121.5	3
Price Offered	100.0	100.0	100.0	120.0	4
Promotion effort	124.2	117.6	86.8	131.5	1
Criteria Value	0.4	0.3	0.3		

The initial assessment results are then proportionally transformed based on positive and negative trends and summed the total of all measurement parameters. Low ranking alternative Table 3 presents the assessment of the performance index for the 4P element obtained first in the promotion effort (total score 131.5), followed by product quality (score 129.4), market place (score 121.5) and the price offered (score 120.0).

### 5.2 Five competitive force (FCF)

**Table 4.** The initial matrix for evaluating the innovation of export-oriented fish product development based on FCF

FCF element	Innovation	Supporter	Inhibitor
Supply Control	8	7.6	8.2
Customer Control	8	7.8	7.8
Entry Protection	5.8	7.2	7
Substitute Protection	6.2	7	6.2
Rivalry Control	6.8	6.2	6.4
Criteria Value	0.4	0.3	0.3

**Table 5.** Transformed matrix through a comparison technique of the FCP performance index

FCF element	Innovation	Supporter	Inhibitor	Total Value	Rating
Supply Control	137.9	122.6	75.6	114.6	2
Customer Control	137.9	125.8	79.5	116.8	1
Entry Protection	100.0	116.1	88.6	101.4	5
Substitute Protection	106.9	112.9	100.0	106.6	3
Rivalry Control	117.2	100.0	96.9	106.0	4
C riteria Value	0.4	0.3	0.3		

As shown in Table 5, the CPI ranking is based on the total score. The first rank is the element 'customer control' with a total value of 116.8. The second rank 'supply control' with a value of 114.6. The third substitute protection with a value of 106.6. The fourth 'rivalry control' with a value of 106.0. Finally, an 'entry protection' with a value of 101.4.

### 5.3 VRIO

**Table 6.** The initial matrix of innovation assessment for the development of export-oriented products based on VRIO

VRIO element	Innovation	Supporter	Inhibitor
Valuable	8.2	8.2	8.2
Awareness	6.2	6.4	5.8
Imitational	6.4	6.6	6
Organizational	6.4	6.2	7
Criteria Value	0.4	0.3	0.3

**Table 7.** Transformation matrix through VRIO performance index comparison technique

VRIO element	Innovation	Supporter	Inhibitor	Total value	Rating
Valuable	132.3	132.3	70.7	113.8	1
Rareness	100.0	103.2	100.0	101.0	3
Imitational	103.2	106.5	96.7	102.2	2
Organizational	103.2	100.0	82.9	96.1	4
Criteria Value	0.4	0.3	0.3		

The results of the measurement transformation VRIO performance index CPI analysis is presented in Table 7. The element of 'value' occupies the first score with a total value of 113.8, then the element 'Imitational' on the second rank with a total value 102.2, followed by the element 'rareness' with a total score of 101.0, and the last element of 'organizational' with a total value of 96.1.

#### *5.4 Key success factor in innovation and product development*

Innovation orientation is seen as an instrument of strategy, policy market-oriented product development. This factor can be the basis for decisions used for competition management. The higher the development needs of the competitive industry, the more oriented the product innovation will be. Research findings obtained in this research shows that variable which is considered important in making decisions for the development of innovation is a Valuable factor with a score of 132.3.

Innovation was a company mechanism to adapt to market demand. In a dynamic environment and competition, companies are required to be able to create new thoughts, new ideas and offer innovative products and increase excellence that is more satisfying to customers. Innovation Development is a way to continue to build and develop an industry R & D organization and team. In all the factors that need to be developed, it is necessary to go through a process of adopting new technology, new applications in the form of products and services, developing new markets and introducing new markets.

Product innovation can increase the profits achieved by the company. From product innovation gives a positive influence on the company because it can increase competitive advantage. Based on Table 2, Table 4 and Table 6 above can be seen that the CPI factor of each dimension meets the criteria as the main factor to be considered.

From this research, it can be seen that factors related to product orientation, promotion orientation, and customer orientation are the key factors considered in the development of product innovation. In this study, it revealed that product development innovation is a way used by the industry to adapt, both in the capabilities and resources owned and the process of understanding the development of international markets that can encourage companies to create more innovative products [19].

The influence of VRIO on decisions in developing innovation from research results can be seen that; the more an industry tends to realize the importance of having competitiveness, the more it wants to develop innovation. Valuable factor (V) products are a priority in decisions for the development of innovation. Although other factors such as rareness, imitational and organizational (RIO), the role cannot be ignored.

The FCF factor is closely related to the performance of innovation development in the fishing industry because FCF factors influence how a competitive force interacts with the external environmental conditions of the industry. Research shows that the factor "customer control" means that market needs are the most considered factor in making innovative decisions. The market needs greatly influence the respondents who make decisions and the fishing industry. The success of an enterprise depends on how the industry responds and relationships to its business environment [20]. The competitive environment influences how the industry will behave.

Marketing mix (the 4Ps) is a factor that is considered essential and complex as supporting the implementation of the innovation program. From observation shows that the obstacles caused by the lack of proper planning of the 4Ps influence the performance of innovation in the industry and ultimately can weaken its competitiveness. The Product Factor (P1) is the most important factor that is prioritized, from other factors considered. Specifically, the product factor (P1), influencing the decision to initiate innovation activities, it requires product knowledge and current trends to deal with the problem of implementing innovations that must be done. Pressure from the market can be a driver in accelerating the behavior and response of product innovation in a fast time.

## **6. Conclusion**

The CPI method can be used to analyze multiple criteria in making innovation decisions for export-oriented fish product development. The decision-making system is based on the parameters of innovation, supporting and inhibiting factors are applied to determine the factors that determine and



can be used as a basis for determining the next policy. The priority of decision making on the 4P element from the highest factor towards the lowest is; (1) promotional efforts, (2) product quality, (3) market place, and (3) prices offered. The highest FCF variable in fish product innovation is the element 'customer control' followed by 'supply control', 'substitute protection', 'rivalry control', and the lowest 'entry protection'. The highest ranking of VRIO elements is 'value' followed by 'imitational', 'awareness' and 'organizational' elements. It can be taken an overview that all variables have an effect, but the factors that have the highest rating need to get more attention because they give a greater impact on an effort in long-term development.

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