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Enhancement Strategy and Performance Evaluation of Organic Vegetable Supplier at Agribusiness Development Station (ADS) IPB

Aditya Anwar Himawan

Student, Management Study Program, Bogor Agricultural University Graduate School, Bogor, Indonesia

Eko Ruddy Cahyadi

Lecturer, Department of Management, Bogor Agricultural University, Bogor, Indonesia

Muhammad Syamsun

Lecturer, Department of Management, Bogor Agricultural University, Bogor, Indonesia

Abstract:

The market demand for organic vegetables products from ADS IPB is very high but the average fulfillment of market demand can not be fulfilled, only a few products that can not be fulfilled by the Agricultural Development Station (ADS) IPB. The purpose of this research 1) Determining the strategy of increasing supply organic vegetables of Agribusiness Development Station IPB 2) Analyzing and determining the performance evaluation indicator of organic vegetable supplier corresponding to the needs of Agribusiness Development Station IPB, 2) Analyzing the best organic vegetable supplier with the highest priority. The phase of processing and analyzing the data in this research are using SWOT analysis method, ABC analysis, and the Analytic Hierarchy Process (AHP). Based on the results, the factors of supplier appraisal as follows, the quality factor (0.403) has two subfactors that have same importance value, the suitability between product supply with the standard set of quality (0.202) and the ability to supply product with consistent quality (0.202). On delivery factor (0.292), the highest subfactor is the accuracy of the delivery number corresponding to the agreement with value (0.140). On responsiveness factor (0.305), the highest subfactor is obtained, that is the ability to provide clear information with value (0.131). Based on the appraisal of the organic vegetable supplier in Agribusiness Development Station IPB (ADS IPB), supplier ranking is obtained with the highest value according to AHP model, that are Fauzi (0.249), Endang (0.217), Ujang (0.214), Lw Liang Group (0.197), Seno (0.123).

Keywords: AHP, evaluation of suppliers, supply chain

1. Introduction

Healthy lifestyle has become a new trend leaving the lifestyle that use non-natural chemicals, such as fertilizers, synthetic chemical pesticide (Syukur dan Melati 2016). Most people choose organic products in its food component with various reasons. The principal consumer motivation choosing organic products is the impact on health (Huber et al. 2011).

According to (Muljaningsih 2011) that among organic products, vegetable is one of the most preferred organic product after rice, it means vegetable is considered as one of the primary need as foodstuffs. Consumer also has choice of organic products as a lifestyle because the price of organic products is relatively more expensive than non-organic products.

Beside that organic vegetables have the production complexity process as compared to non-organic vegetables, the following points must be considered in organic vegetables production based on ISO 6729: 2013 (Permentan No 64 / Permentan / OT.140 / 5/2013), namely terms of conversion and contamination, seed and nursery, water resource, soil fertility management, HPT control, and post-harvest handling.

(Syukur and Melati 2016) argued that there are some micro obstacles encountered at the farm level, especially small farmer. Those micro obstacles are ; (1) few farmers have an interest to organic farming because of lack understanding about organic farming systems, (2) high cost of organic product certificatio, (3) organization at the farm level has not formed properly. Agribusiness organic products at the level of small farmers will be difficult to be realized without the support of farmer organization, and (4) The partnership of farmer and entrepreneur.

(Damardjati 2005) said that the demand of organic food is increasing in whole world and if Indonesia can meet this need then can increase the export of organic product, it will improve the competitiveness of agricultural enterprises (agribusiness) in Indonesia and can increase foreign exchange earnings and income of farmer household.

Agribusiness Development Station (ADS) IPB has an important role to meet the need of organic vegetable consumption in Indonesia. As a producer and distributor of horticultural commodity to the modern market and several hotels and restaurants. The vegetables were channeled produced from their own gardens and partnerships with suppliers that assisted farmers.

Market demand for organic vegetable product from ADS IPB is very high but the average fulfillment of market demand can not be met, only a few products that could almost be fulfilled by ADS IPB. Organic vegetable is distributed and produced from their own farm and suppliers those are assisted farmers, horticulture produced by ADS only 30% and the remaining of 70% met from production suppliers as partner ADS IPB.

With partnership that is done then ADS IPB should have a good supplier. Successful implementation of supply chain management is determined first by the decision-supplier strategic (Hou and Huang 2002). Therefore, it needs a study about performance evaluation of suppliers which has an important role in determining the managerial decisions and can determine decision of supply chain management strategy. Beside the effect of increasing competition in the business to make the company increasingly aware that business success is not only determined by the internal aspect, but also the external aspect of company, one of them is the supplier (Muslim and Iriani 2010). In addition, the demand aspect of quality, delivery time and cost in an increasingly globalized market competition today adds complexity supplier selection decisions (Ting and Cho 2008). According to that explanation, the purposes of this study are:

1. Determine the strategy of increasing the supply of organic vegetable in ADS IPB.
2. Analyze and determine the performance evaluation indicator of organic vegetable supplier in accordance with the need of ADS IPB.
3. Analyze the best suppliers with the highest priority.

2. Research Method

2.1. Research Location and Period

This research was conducted in Agribusiness Development Station (ADS) IPB. Cikarawang RT 03 / RW 07 Dramaga, Bogor, West Java, Indonesia. The research was carried during three months from August to October 2016

2.2. Data Type and Source

The method used in this research is qualitative descriptive. Data used include primary data and secondary data. The primary data obtained through interviews and questionnaires. Interviews and questionnaires conducted with management Agribusiness Development Station (ADS) IPB. The selection of respondents is based on:

1. Employee of Agribusiness Development Station (ADS) IPB who already has experience.
2. Related to procurement of raw materials.
3. Related to working relationships with suppliers Agribusiness Development Station (ADS) IPB.

No	Position	Division
1	Manager	Production
2	Manager	Program dan Accompaniment
4	Head of Division	Farmer accompaniment

Table 1: List of Respondents

2.3. Data Analysis Procedure

Data analysis procedure using methods that are relevant to the problem. The following are the stages of processing and data analysis in this research: using SWOT analysis method, ABC analysis, and the Analytic Hierarchy Process (AHP).

3. Findings

3.1. The Matrix Analysis of Internal Factor Evaluation

No	Faktor Internal	Bobot (A)	Rating (B)	Skor (A x B)
Strength				
1	Having good product quality	0,305	3,6	1,098
2	Having SOP for cultivation process in production terrain at ADS IPB and partnership farmer referred to Good Agricultural Practice (GAP) and Good Handling Practice (GHP)	0,278	3,3	0,917
3	Having facility which support production process containing nursery area, vegetable and fruit production terrain, packing house and landscape	0,250	3	0,750
Weaknesses				
5	The result of production has not met totally demand	0,084	1	0,084
6	Has not had information system integrated to supplier	0,083	1	0,083
Total		1	11,9	2,932

Table 2: The result of IFE matrix

Based on the Internal Factor Evaluation (IFE) matrix calculations, it can be seen that the power factor that is ranked first with weighted value 0.305 has good quality products. This factor becomes very important one of the strengths of the company. By having a good quality product that can be company value-added to make loyal customers.

The weakness of factors, namely the production does not meet the overall demand has the highest weighted value of 0.084. It makes the company does not use its power optimally.

3.2. The Matrix Analysis of External Factor Evaluation

No	Faktor Eksternal	Bobot (A)	Rating (B)	Skor (A x B)
Opportunity				
1	Support from specialist HR in holticulture field from IPB	0,444	4	1,776
2	Increasing of society trend consumption through vegetable	0,333	3	1,999
Threat				
3	Competitor has better supplier performance	0,111	1	0,111
4	Competitor does not give the product supply appropriate to the number of settled contract	0,112	1	0,112
Total		1	10,2	2,998

Table 3: The result of EFE matrix analysis

Based on the results of EFE matrix calculations in Table 3 shows that the chance factor is ranked first with a weighted value of 0.444 is human resources support experts in the field of horticulture from the Bogor Agriculture University. This factor becomes one very important opportunity in the current era of competition, where the need for skilled human resources in the development of the quality of horticultural products.

On the threat factors, suppliers do not provide the appropriate amount of product supply contract stipulated received the highest weighted value of 0.112 and a major threat to ADS, therefore the company should be able to anticipate these threats by taking advantage of all the opportunities that exist to strengthen the company.

3.3. The Internal and External Matrix

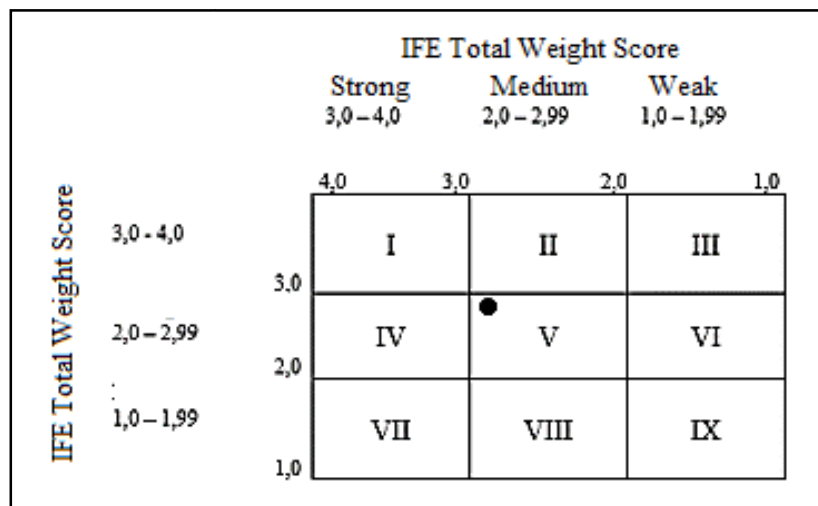


Figure 1: The result of IE matrix

Based on the first image on the matrix known the total value of IFE matrix is 2.932 and total value of EFE matrix is 2.998. The matrices shows that IE matrix of ADS IPB is in quadrant V position, illustrating that is in a position *Hold and Maintain*. The suggested strategy is new product development strategy / product optimization, and improving access to a wider market by forming partnerships with external parties / stakeholders (David 2009).

3.4. The SWOT Matrix Analysis

From the analysis of IFE and EFE matrix, the next stage is the stage of integration / analysis (matching stage) between the strengths, weaknesses, opportunities and threats using SWOT matrix. The results formulation grouped into four (4) group of the formulation of a strategy consisting of a strategy Strength-Opportunities (SO), the strategy Weaknesses-Opportunities (WO), the strategy Strengths-Threats (ST), and strategies Weaknesses-Threats (WT), as submitted in Table 4.

Internal	STRENGTH-S	WEAKNESSES-W
	<ol style="list-style-type: none"> 1. Having good product quality 2. Having SOP for cultivation process in production terrain at ADS IPB and partnership farmer referred to Good Agricultural Practice (GAP) and Good Handling Practice (GHP) 3. Having facility which support production process containing nursery area, vegetable and fruit production terrain, packing house and landscape 	<ol style="list-style-type: none"> 1. The result of production has not met totally demand 2. Has not had information system integrated to supplier
External	SO STRATEGY	WO STRATEGY
OPPORTUNITY-O	<ol style="list-style-type: none"> 1. Supplier training and accompaniment (S1, S2, S3, O1) 	<ol style="list-style-type: none"> 1. Supplier network development(W1, W2, O2)
THREATS-T	ST STRATEGY	WT STRATEGY
<ol style="list-style-type: none"> 1. Competitor has better supplier performance 2. Competitor does not give the product supply appropriate to the number of settled contract 	<ol style="list-style-type: none"> 1. Reward and punishment system development (S1, S2, S3, T1, T2) 	<ol style="list-style-type: none"> 1. Information system and management design and development (W1, W2, T1, T2)

Table 4: The SWOT Matrix

3.5. Supplier Performance Improvement Strategy

From the results of SWOT analysis known that ADS IPB has the weakness of production. It does not meet the overall demand, then the strategy of supply chain suite is responsive supply chain for the purpose to achieve a level of high responsiveness so that it can respond quickly to changes in demand which occurred in the market (Fisher 1997).

3.6. The Hierarchy Process of Supplier Performance Improvement Strategy

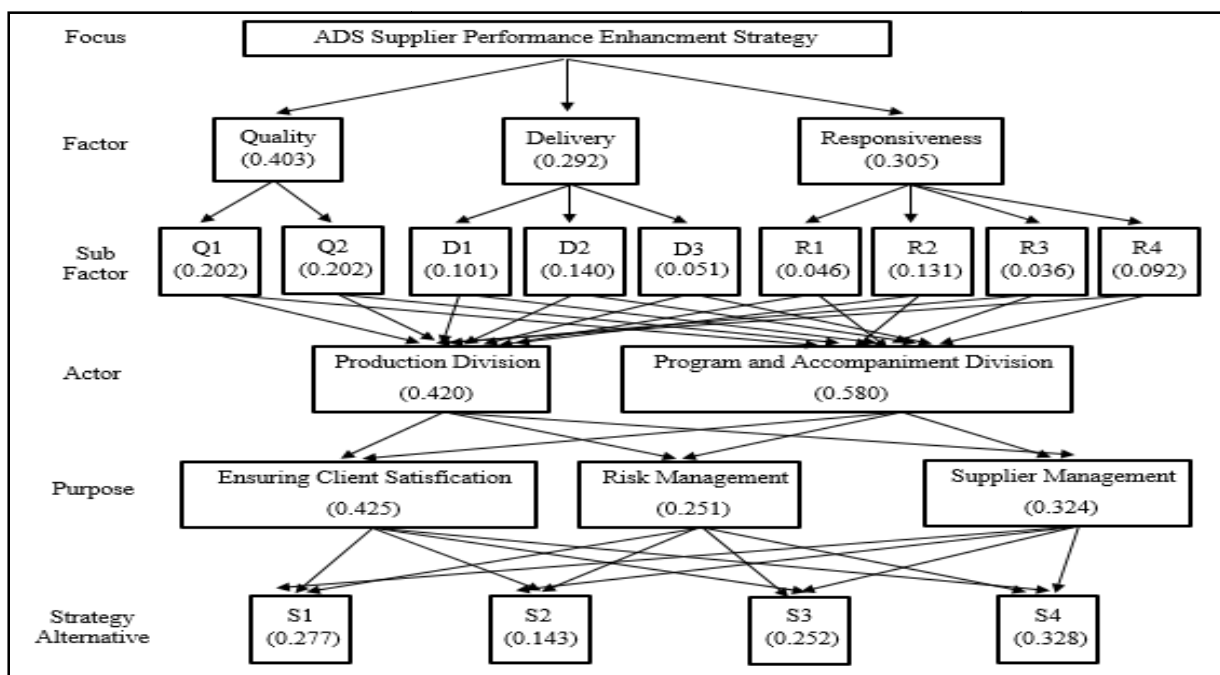


Figure 2: The Hierarchy Structure of Supplier Performance Improvement Strategy ADS IPB

Explanation of Figure 2:

Q1 : Conformity supply products with quality standards set

Q2 : The ability to provide product supply with consistent quality

D1 : On time delivery

D2 : The accuracy of the number of deliveries per agreement contract

D3 : Conformity structure products with established standards

R1 : Ability to respond to the complaint

R2 : Ability to give clear information

R3 : Respond to change time delivery

R4 : Respond to change delivery amount

S1 : Training and Accompaniment for supplier

S 2 : Reward and Punishment system development

S 3 : Information and management system design and development

S 4 : Development of supplier network

The results of horizontal and vertical process, which is merging expert assessment who have been described previously can be used as information and considerations to achieve supplier performance improvement strategy in ADS IPB Each level of the hierarchy (factors, actors, objectives, and alternative strategies) has a priority to help improve the performance of suppliers in ADS IPB. The priority is:

1. The factors level, Quality 0.403 is a benchmark of the most preferred company than other factors. It refers to the satisfaction of customers who want the quality of high value horticultural products and do not disappoint the customer.
2. The actors level, the most important actor in the performance evaluation system supplier in ADS IPB is a division and accompaniment program with the highest weight value of 0580.
3. The level of interest, ensuring customer satisfaction is a top priority at the level of interest in supplier performance improvement strategy ADS IPB with the highest weight value of 0.425. Ensuring customer satisfaction is the goal of supply chain management. The customers are the main targets of activity of the production process of each product produced by the company.
4. The alternative strategy level, alternative development supplier network strategies gets the highest priority level with 0.303 weight value. To manage the risk of lack of supply of products to meet demand, the supplier network development strategy is considered effective, because the number of suppliers is unable to meet the entire market demand now.

3.7. ABC Analysis

ABC analysis to determine the supplier becomes the object of research priorities. According to (Render and Heizer 2001) split the ABC analyst into three groups based on annual volume amounts of money.

According to the table 5 can be seen in group A with an investment of 73.5% consisted of five suppliers, group B with an investment of 19.4% comprised 2 suppliers, and group C with an investment of 7.1% to 2 suppliers. From the analysis of ABC with an investment, it is known that priorities researchers to be the object of research assessment is Lw liang supplier group with total income 68.9185 million (17.8%), Ujang with a total income of 62.9035 million (16.5%), Endang with total income 59.6905 million (15.2%), Fauzi with total income 52.663 million (13.6%), and Seno with total income of 41.16 million (10.4%).

No	Supplier	Comodity	Volume (kg)	Income	Total Income	%	Accumultatin	Class
1	L liang grup	B. Merah	1.421	13.499.500	68.918.500	17,8		
		B. Hijau	3.822	32.487.000				
		Kangkung	3.822	22.932.000				
2	Ujang	Baby Kailan	1.920	19.200.000	62.903.500	16,5		
		Caisim	1.200	10.800.000				
		Selada	931	9.310.000				
		B.Merah	980	9.310.000				
		B.Hijau	983	8.355.500				
3	Endang	Kangkung	988	5.928.000	59.690.500	15,2	73,5	A
		B.Merah	1.009	9.585.500				
		B.Hijau	2.930	24.905.000				
		Selada	1.872	18.720.000				
4	Fauzi	Kangkung	1.080	6.480.000	52.663.000	13,6		
		Caisim	1.316	11.844.000				
		Pakcoy	1.263	11.367.000				
		Selada	980	9.800.000				
		B.Merah	1.411	13.404.500				
5	Seno	B.Hijau	735	6.247.500	41.160.000	10,4		
		Baby Kailan	2.205	22.050.000				
		Selada	1.911	19.110.000				
6	Alias	Baby Kailan	1.200	12.000.000	40.080.000	10,2		
		Caisim	1.872	16.848.000				
		Pakcoy	1.248	11.232.000				
		B Merah	1.920	18.240.000				
7	Hidayat	B Hijau	947	8.049.500	37.569.500	9,2	19,4	B
		Kangkung	1.880	11.280.000				
		Caisim	960	8.640.000				
8	Edvan	Pakcoy	720	6.480.000	15.120.000	4,1		
		Caisim	960	8.640.000				
		Kangkung	1.470	8.820.000				
9	Ramadhan	Kangkung	1.470	8.820.000	8.820.000	3	7,1	C
Total			44.996	386.925.000	386.925.000	100	100	

Table 5: ABC Analysis

3.8. The Analysis of Process Result of Sub Factors against Alternative

Once the factors and subfactors along each weighing has been determined, then is the assessment of suppliers based on factors and sub-factors that have been determined.

The next comparison is the assesment of subfactor against alternative. In this case, the alternative is the supplier of organic vegetables ADS IPB. Assessment is done horizontally, comparing sub factor with one supplier with other suppliers. In Table 6 are presented the results of the assesment of significance to the alternative sub factor in this case horticulture supplier ADS IPB.

Sub Factors	Lw Liang Grup	Ujang	Endang	Fauzi	Seno
Conformity supply products with quality standards set	0,124	0,325	0,231	0,210	0,110
The ability to provide product supply with consistent quality	0,125	0,250	0,250	0,250	0,125
On time delivery	0,268	0,076	0,202	0,319	0,135
The accuracy of the number of deliveries per agreement contract	0,207	0,207	0,347	0,130	0,108
Conformity structure products with established standards	0,393	0,206	0,161	0,120	0,120
Ability to respond to the complaint	0,181	0,280	0,128	0,313	0,098
Ability to give clear information	0,243	0,139	0,139	0,351	0,127
Respond to change time delivery	0,255	0,144	0,144	0,288	0,169
Respond to change delivery amount	0,286	0,143	0,143	0,286	0,143

Table 6: The Assessment of ADS IPB Supplier

3.9. The Hierarchy Process Assessment Suppliers ADS IPB

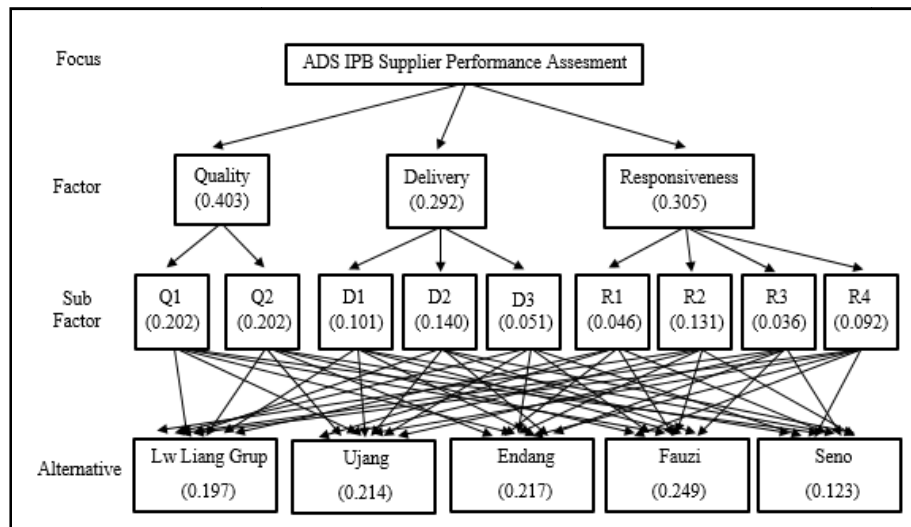


Figure 3: The Hierarchy Structure of Assessment Suppliers Strategy ADS IPB

Based on the results of the final assessment, Fauzi scored highest weight of 0.249. This shows that multiple factors and sub-factors which are set by the company has been achieved by either by the supplier Fauzi, from 9 sub factors Fauzi ahead on six sub-factors: the ability to provide product supply with consistent quality, timeliness of delivery, the ability to respond to the complaint, giving information clearly, responding to changes in delivery time, and responds to changes in the number of shipments.

The second ranked supplier Endang obtained by weighting the value of 0.217. Endang superior in sub-factor provides product supply with consistent quality and accuracy of deliveries corresponding contractual agreements.

Third-ranked supplier Ujang obtained by weighting the value of 0.214. ahead in suitability supply products with the specified quality standards and the ability to supply products with consistent quality

The fourth ranked is obtained Lw Liang Group with 0.197 weight value. Lw Liang Group excelled on sub factors structuring product conformity to established standards and respond to changes in the number of shipments. The fifth ranked supplier Seno obtained by weighting the value of 0.123. Suppliers Seno not superior to the assessment sub-factor has been determined.

3.10. Managerial Implications

Based on this research can be made managerial implications that can be done, that is establishing an alternative strategy to be applied by ADS IPB. The first alternative strategy with is developing a network of suppliers (0.303), because by increasing the number of supplier it can manage the risk of lack supply of product to meet demand, it agrees with (Ferdinand and Augusty 2003), that the development of the supplier network as an instrument of policy strategies distribution can be used for managing the competition with the assumption that the higher of distribution intensity applied stronger strength owned and the more likely the good and service offered can be sold to specific target markets.

The second alternative strategy with weight value (0.277) : training and accompaniment supplier, it can be known from the assessment sub-factor to supplier. Some suppliers scored low on each assessment factor, it needs more attention from the management ADS IPB to provide appropriate training with supplier assessment factors.

The third alternative strategy with weight value (0.259) design and development of information system and management. According to (Ward and Peppard 2002), information system strategy is a strategy that defines the need of organization or company to information and system that support the overall business strategy of an organization. The information system required by ADS IPB for managing the supply chain network from supplier to consumer. With this information system, the ADS can manage the risk of stock out.

The fourth alternative strategy with weight value (0.164) the development of reward and punishment system. From the result of the supplier performance assessment can be known that a supplier who get grade A in the ABC analysis does not provide a high performance rating, but the suppliers who get grade B in the ABC analysis received high performance rating. Therefore supplier who get high performance rating should a supplier who received high performance ratings can get the number of higher contract product as a reward, and supplier who get lower performance rating has to reduce the number of contracts as a punishment.

4. Conclusion

The appropriate strategy used by ADS IPB is the development of a network of suppliers as by increasing the number of suppliers to manage the risk of lack supply of products to meet market demand. Factors Quality, Delivery, and Responsiveness can be an effective assessment factor to supplier of organic vegetable in ADS IPB. The best supplier given highest priority is Fauzi.

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