Development of Chocolate Beverage Products by Considering Consumer Preferences

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Abstract

Currently, there are many different consumer demands for a product. Chocolate beverages are one example. Businesses engaged in chocolate beverage must develop products in order to survive in the market and adapt to changing consumer preferences. In this research, the conjoint analysis approach was used to determine customer preferences for the attributes of chocolate drinks that were considered important, and the DEMATEL method was used to obtain the right modules so that they could generate a variety of products. Based on the results of data collection and processing, it is known that there are five attributes that are considered important by consumers in the development of chocolate beverage products, that is flavor, topping, serving condition, cup size and health benefit. Each attribute has a level that the consumer has chosen and that is regarded important. 25 chocolate drink product alternative are created based on the attributes and levels acquired. Chocolate beverages with original chocolate flavor, medium cup size, additional ice cream, serving conditions with normal ice, and low calorie health content are the top consumer preferences for the combination of chocolate drink products. There are four modules created from the relationship between attributes utilizing the DEMATEL method to aid the development of various chocolate drink products.

Keywords
Conjoint Analysis, Chocolate Beverage Products, DEMATEL, Attribute, and Module.

1. Introduction

Currently, society is faced with technological developments that can make the industry more creative and innovative in producing a product. One of the current beverage businesses is chocolate drinks. Chocolate is made from cocoa beans where Indonesia is one of the largest cocoa-producing countries in the world in 2019 (FAO). Cocoa produced by Indonesia will be processed into several products, such as cocoa liquor, cocoa butter, cocoa cake, and cocoa powder (kemenperin.go.id, 2019). As one of the largest cocoa producers in the world, in 2018 the majority of processed cocoa products produced by Indonesia were exported, amounting to 328,329 tons, while the remaining 15%, namely 58,341 were marketed in Indonesia (kemenperin.go.id, 2019). The level of public consumption in Indonesia for processed cocoa products is still relatively low compared to other Asian countries. Saleh Husin at that time served as the Minister of Industry said in the commemoration of the 3rd Indonesian Cocoa Day in Yogyakarta in September 2015 that public consumption of processed cocoa products was only around 0.5 kg per capita per year where Malaysia and Singapore consumption levels reached 1 kg per capita per year and in Europe, it reaches up to 8 kg per capita per year (rikolto.org, 2015).

The level of consumption of Indonesian people which is still quite low with processed cocoa products will make the chocolate business in Indonesia even lower. Therefore, the government needs to increase public awareness to consume chocolate by providing education and promotion both at home and abroad (kemenperin.go.id, 2019). In addition, the Ministry of Industry also emphasized the development of the cocoa processing industry which will produce chocolate processed products with various variations. In other words, entrepreneurs who have a business in chocolate food and

beverages are required to be more creative in developing their products for consumers and can be adapted to the needs and desires of consumers. This is expected to increase public interest in consuming chocolate and also the chocolate business in Indonesia can continue to grow and increase.

According to Wang and Shih (2013), in the current era of globalization, demand from customers changes dynamically driven by technological developments so that the business market must be able to offer appropriate products. As a result, the level of corporate rivalry has increased, and the chocolate beverage industry must be able to keep up with current consumer trends in modern beverages. Putri et al. (2016) reveal that quality engineering is one of the approach that important for company to design and develop product/process which meet customer requirement. The owner needs to design items that can be adapted to the needs and wants of consumers in order to continue to expand in this business. According to Wedowati et al. (2020), the food and beverage industry's production method allows for the production of a variety of products from the same raw ingredients. However, the company will not be able to accommodate all of the various customer needs. To compete with other businesses, a company must develop new concepts to meet the diverse and difficult-to-understand wants and needs of its consumers (Tajuddin in Gustianda 2013). Because mass production is used to make things on a big scale without a lot of product variations, it cannot be processed to create flexible products that meet the needs and wants of consumers. As a result, at the end of the 1980s, the concept of mass customization evolved to meet the demands of these various consumers (Pine in Hu, 2013).

Mass customization is a new concept that aims to serve and provide products suited to customers in big quantities without increasing production costs (Tseng et al. 1996; Xu 2007). Because mass customization is typically applied to the manufacturing industry, garments, and other industries, little research has been done on its applicability in the food and beverage business.

Several researchers have conducted product development research, such as Budiyanti (2013)'s "Development of Beng-Beng Chocolate Wafer Products Based on Consumer Preferences," in which product development aims to produce large quantities of products with various kinds of variations that are adjusted to the consumer using the conjoint analysis method. Purba et al. (2018) published an article titled "Development of Chocolate Food Products Based on Consumer Preferences," in which authors used the importance performance analysis approach to discover important attributes for consumers when buying chocolate food. Wang and Wang (2014) also published an article titled "Combining Fuzzy AHP and Fuzzy Kano to Optimize Product Varieties for Smart Cameras: A Zero-One Integer Programming Perspective," in which authors used the AHP and Kano methods to optimize product variations in development based on consumer preferences. Putri et all. (2016) in their article entitled “Redesign of Tresher Machine for Farmers Using Rapid Upper Limb Assessment (RULA) Method” also applied product development by redesigning thresher machines for farmers. Putri and Retha (2016) implemented QMS in designing quality system documentation for hydrotiller production.

Based on this, the research conducted on the development of chocolate beverage products aims to combine the conjoint analysis approach and the DEMATEL method to apply the concept of mass customization. The concept of mass customization can be applied to the chocolate beverage industry because it can customize chocolate beverages to consumer demand based on existing variation choices and generate large quantities of chocolate drinks based on future needs estimates. In addition, this research was carried out in order to expand and multiply research related to the production of food or beverage goods using the concept of mass customization, as well as the conjoint analysis method and DEMATEL.

1.1 Objectives

The aim of this research is to identify customer preferences for important attributes and levels in chocolate beverage products and identify what types of modules should be provided in the development of chocolate beverage products.

2. Literature Review

The literature review research consists of consumer preferences, conjoint analysis methods and decision making trial and evaluation laboratory (DEMATEL) methods. Consumer preference, according to Kotler and Armstrong in Lestiroyini (2015), is a person's desire to determine the goods or services that will be consumed and felt in order to obtain their personal satisfaction from the consumption of these goods or services. Preference is determined by the consumer's mindset for a variety of reasons, including (Lestiroyini 2015):

a. Consumer experiences that have previously occurred
b. Beliefs or customs passed through the generations.

Budiyanti (2013) state that consumer preferences will encourage companies to conduct marketing measurements, which can be caused by a number of factors, including increased business competition, changing consumer desires as a result of technological advancements, and high investment and resource expenditure. There are several methods used in determining consumer preferences, such as quality function deployment (QFD), analytical hierarchy process (AHP), analytical network process (ANP), and conjoint analysis (CA).
Conjoint analysis is a technique for determining consumer preferences for a product or service by assessing the utility and relative importance of the product's attributes (Hair in Wijayanto and Angraeni 2017). The goal is to understand consumer perceptions of products and services in order to design products and services that meet customer needs and wants. The Conjoint Analysis method is more suitable in this research than other methods. Because the Conjoint Analysis method can provide a stimulus and develop a product configuration of attributes and levels that are customized to consumer preferences. This strategy is based on the consumer's subjective choice of the product attributes offered (Puspitasari and Hasya 2014). In addition, this method may be used to determine the level of important of an attribute depending on consumer preference. It will be easier for producers to find out what consumers want if this method is used in the development of chocolate beverage products. Later, the subjectivity of the customer will be assessed using a Likert scale (score). In conjoint analysis research, there are three approaches for forming combinations that are commonly used (Irawati et al. 2014):

a. Full Combination Method
b. Pairwise Combination Method
c. Trade-off Method

In addition, the decision making trial and evaluation laboratory (DEMATEL) method was used to determine the type of module.Permadi et al. (2019) states that the DEMATEL concept was first developed between 1972 and 1976 by the Batelle Memorial Institute of Geneva's Science and Human Affraid Program. DEMATEL has been quite popular in recent years for solving complex causal relationship problems (Lee et al. 2011). The DEMATEL method's results reveal that multiple components have a reciprocal relationship and may be utilized to determine which factors impact or affect each other. This method uses the concept of matrices and mathematical techniques to measure causality and strength between interdependent elements or factors. The rating scale used in DEMATEL is:

0 = No effect
1 = Low influence
2 = Medium influence
3 = High influence
4 = Very high influence

3. Methods

3.1 Consumer Preferences

In this research, consumer preferences were determined using a survey, specifically by distributing the phase I quetionnaires. The phase I questionnaires were utilized to find the attributes and important levels that chocolate drink customer wants and need. Questionnaires were distributed online to consumers who had consumed chocolate drinks. Purposive sampling was utilized in this research, and the sample was chosen based on the research's subject and criteria. There were 108 people that responded to the phase I questionnarie of the survey.

3.2 Conjoint Analysis

The phase II questionnaire data was used in the conjoint analysis. The results of the phase I of the questionnaire will be utilized to determine the assessment of each alternative combination of chocolate drink products in the phase II of the questionnaire. A total of 106 people responded to the phase II of the questionnaire. The data will then be analyzed using the conjoint analysis method to determine consumer preferences for a combination of chocolate drink product attributes by examining the importance value and utility estimate of each attribute and level in the chocolate beverage products that will be developed. In general, the mathematical form of conjoint analysis can be formulated as follows (Wang 2015).

$$U_k = \beta_0 + \sum_{i=1}^{m} \sum_{j=1}^{n} u_{ijk} \quad \textbf{(1)}$$

Where:
U_k = total utility of product configuration alternatives
β_0 = constant
u_{ijk} = alternative utility k for attribute I and level j in product configuration
m = total attribute
n = total level

3.3 Decision Making Trial and Evaluation Laboratory (DEMATEL)

It is necessary to design a modularity design in the development of this chocolate drink product to simplify the use of the concept of mass customization. The modularity design was chosen because it helps product development for producers by dividing the product into multiple components. These components will be organized into modules based on their functional similarity. As a result, the DEMATEL method is more suited to producing this chocolate drink module because determining the module only necessary looking at the relationships that exist between attributes, allowing later relevant attributes to be grouped into a module. The DEMATEL technique is performed in seven steps (Lee et all. 2011).

Step 1: Create an evaluation scale

The evaluation carried out will use the measurement criteria on a scale of 0 to 4.

Step 2: Create a direct-influence matrix

The Z matrix is the matrix that has a direct influence on the observed attributes, with zij indicating the level of influence of attribute i on attribute j. The mathematical model of the Z matrix model is as follows.

$$Z=\begin{bmatrix} 0 & z_{12} & \cdots & z_{1n} \\ z_{21} & 0 & \cdots & z_{2n} \\ \vdots & \vdots & 0 & \vdots \\ z_{n1} & z_{n2} & \cdots & 0 \end{bmatrix} \quad \textbf{(2)}$$

Step 3: Constructing a normalized direct relationship matrix

Equations (3) and (4) are used to create the normalizing matrix.

$$X = k \,.\, Z \quad \textbf{(3)}$$

$$k = \min\left[\frac{1}{\max i \sum_{j=1}^{n}[z_{ij}]}, \frac{1}{\max j \sum_{i=1}^{n}[z_{ij}]}\right], \; i,j = 1,2,\ldots,n \quad \textbf{(4)}$$

Step 4: Get the total influence matrix

The following is the equation for obtaining the Tc matrix:

$$Tc = X\,(I - X)^{-1}, \quad I = \text{identity matrix} \quad \textbf{(5)}$$

Step 5: Analyzing the gained advantages and relationships

To get the advantages and attribute relationships, it is done by adding up each column and row in Tc. This is done to produce vector D and vector R, the following equation is obtained.

$$D_i = \left[\sum_{j=1}^{n} t_{ij}\right], \quad j=1,2,\ldots,n \quad \textbf{(6)}$$

$$R_j = \left[\sum_{i=1}^{n} t_{ij}\right], \quad i=1,2,\ldots,n \quad \textbf{(7)}$$

Step 6: Determine the threshold value

The threshold value is obtained from calculating the average value on the Tc matrix.

Step 7: Describing a network relationship map (NRM)

NRM is represented by (D+R) as the transverse line and (D-R) as the longitudinal axis (Wedowati et al. 2020).

4. Results and Discussion

4.1 Consumer Preferences (Descriptive Analysis)

A descriptive analysis was performed to establish customer preferences for important attributes and levels. The first-stage questionnaire has been distributed to consumers who have ever consumed chocolate drinks. Tables 1 and 2 show the outcomes of the recapitulation of respondents' responses.

Table 1. Recapitulation of Attributes Considered Important by Respondents

No	Attribute	Total	Percentage
1	Flavor	105	97.2%
2	Topping	72	66.7%
3	Serving Condition	66	61.1%
4	Cup Size	55	50.9%
5	Health Benefits	48	44.4%
6	Cup Type	18	16.7%
7	Price	2	1.9%
8	Hygiene	1	0.9%

Table 2. Recapitulation of Level Choice of Each Attribute by Respondents

No	Attribute	Level	Total	Percentage
1	Flavor	Original Chocolate	70	64.8%
		Caramel Chocolate	49	45.4%
		Hazelnut Chocolate	48	44.4%
		Dark Chocolate	46	42.6%
		Matcha Chocolate	25	23.1%
		White Chocolate	18	16.7%
		Chocolate Banana	17	15.7%
		Choco Mint	13	12.0%
		Chocolate Avocado	11	10.2%
		Almond Chocolate	1	0.9%
		Belgian Chocolate	1	0.9%
2	Serving Condition	Normal Ice	71	65.7%
		Less Ice	33	30.6%
		No Ice	4	3.7%
3	Cup Size	Medium (470 ml)	88	81.5%
		Large (640 ml)	40	37.0%
		Small (350 ml)	19	17.6%
		Extra (1000 ml)	13	12.0%
4	Topping	Pudding Jelly	73	67.6%
		Bubble	54	50.0%
		Ice Cream	49	45.4%
		Cream Cheese	42	38.9%
		Oreo	42	38.9%
		Choco Chips	35	32.4%
		Cheese	31	28.7%
		Whipe Cream	30	27.8%
		Jelly Bomb	19	17.6%
		Chocolate	18	16.7%
		Grass Jelly	16	14.8%
		Strawberry Jelly	1	0.9%
		Melon Jelly	1	0.9%
		Rainbow Jelly	1	0.9%
5	Health Benefits	No Preservatives	90	83.3%
		Low Sugar	68	63.0%
		Low Calorie	67	62.0%
		Low Fat	64	59.3%

The results of the recapitulation obtained attributes and levels that are considered important by consumers for chocolate beverage products. The attributes and levels employed in this research are based on the outcomes of high-percentage-value consumer preferences. Based on this, there are 5 attributes that are considered important by consumers because these five attributes have a large proportion compared to other attributes.

The attributes that will be used in this research consist of flavor with a percentage of 97.2% (original chocolate, dark chocolate, hazelnut chocolate, and caramel chocolate), topping with a percentage of 66.7% (ice cream, cream cheese, bubble, oreo, and jelly pudding), drink state with a percentage of 61.1% (normal ice, no ice, and less ice), cup size with a percentage of 50.9% (small, medium, and large), and health benefits with a percentage of 44.4% (no preservatives, low sugar, and low calorie). Overall, the selected attributes and levels can be seen in Table 3.

Tabel 3. Atribut dan Level Produk Minuman Cokelat yang Digunakan

No	Attribute	Level
1	Flavor	Original Chocolate
		Caramel Chocolate
		Hazelnut Chocolate
		Dark Chocolate
2	Serving Condition	Normal Ice
		Less Ice
		No Ice
3	Cup Size	Medium (470 ml)
		Large (640 ml)
		Small (350 ml)
4	Topping	Pudding Jelly
		Bubble
		Ice Cream
		Cream Cheese
		Oreo
5	Health Benefits	No Preservatives
		Low Sugar
		Low Calorie

4.2 Product Combination with Conjoint Analysis Approach

The full profile method is used in this research's conjoint analysis. The result of the phase I questionnaire identified 5 attributes there is one attribute consisting of 5 levels, one attribute consisting of 4 levels, and three other attributes consisting of 3 levels. When all levels of attributes are combined, 5 × 4 x 3 x 3 x 3 = 540 product combinations are created. Based on these results, the full factorial design cannot be employed in this research because it will cause respondents to fill out the questionnaire in an inefficient and wasteful manner. Furthermore, it will cause the data acquired from the questionnaire responses to be invalid, requiring the reduction of product combinations. As a result, the research adopted a fractional factorial design, also known as an orthogonal design.

The orthogonal design is intended to limit the number of stimuli or product combinations while still representing the entire range of available alternatives. This research employs an orthogonal design, which is aided by SPSS software. Table 4 shows the output of the product combination that was acquired using SPSS software.

Table 4. Chocolate Drinks in a Variety of Combinations

No.	Flavor	Serving Condition	Cup Size	Topping	Health Benefits
1	Caramel Chocolate	Less Ice	Small	Pudding Jelly	Low Calorie
2	Caramel Chocolate	Less Ice	Medium	Ice Cream	Low Sugar
3	Dark Chocolate	No Ice	Large	Bubble	Low Calorie
4	Hazelnut Chocolate	Less Ice	Medium	Bubble	No Preservatives

5	Dark Chocolate	Normal Ice	Medium	Pudding Jelly	Low Sugar
6	Caramel Chocolate	Normal Ice	Medium	Bubble	No Preservatives
7	Dark Chocolate	Normal Ice	Small	Cream Cheese	Low Sugar
8	Original Chocolate	Normal Ice	Medium	Ice Cream	Low Calorie
9	Original Chocolate	No Ice	Small	Ice Cream	No Preservatives
10	Hazelnut Chocolate	Normal Ice	Small	Oreo	No Preservatives
11	Original Chocolate	No Ice	Medium	Cream Cheese	No Preservatives
12	Hazelnut Chocolate	No Ice	Medium	Pudding Jelly	Low Sugar
13	Dark Chocolate	Less Ice	Medium	Oreo	No Preservatives
14	Original Chocolate	Less Ice	Small	Bubble	Low Sugar
15	Original Chocolate	Normal Ice	Medium	Oreo	Low Calorie
16	Original Chocolate	Less Ice	Large	Oreo	Low Sugar
17	Dark Chocolate	Less Ice	Small	Ice Cream	No Preservatives
18	Original Chocolate	Less Ice	Medium	Cream Cheese	Low Sugar
19	Caramel Chocolate	No Ice	Small	Oreo	Low Sugar
20	Hazelnut Chocolate	Normal Ice	Large	Ice Cream	Low Sugar
21	Caramel Chocolate	Normal Ice	Large	Cream Cheese	No Preservatives
22	Original Chocolate	Normal Ice	Small	Bubble	Low Sugar
23	Hazelnut Chocolate	Less Ice	Small	Cream Cheese	Low Calorie
24	Original Chocolate	Less Ice	Large	Pudding Jelly	No Preservatives
25	Original Chocolate	Normal Ice	Small	Pudding Jelly	No Preservatives

The product combination if calculated manually using the following formula (Hair et al. in Lestiyorini 2015):
Minimum number of combinations = Total of all levels – Number of attributes + 1
Minimum number of combinations = 18 – 5 + 1
Minimum number of combinations = 14

The number of product combinations that must be provided to reduce deviations that occur in the conjoint analysis is 1.5 to 2 times the minimum number of combinations that exist (Krestonea 2010). Based on Table 4, it is found that the number of product combinations is 25 where the number of combinations already meets the requirements of the number of product combinations that must be provided. The combination of chocolate drink products obtained will be used as the second stage of questionnaire design.

A. Assessment of the Combination of Chocolate Drink Products Using the Conjoint Analysis Approach

The conjoint analysis method will be used to process the ratings given by respondents on 25 chocolate drink product combinations using the Likert scale in the second phase of the survey. This is done to determine consumer preferences for the attributes and levels that will be used in the development of chocolate beverage products. Conjoint analysis is performed by analyzing the important value and utility estimations derived from consumer evaluations of product combinations. SPSS software is used to process the data in order to obtain this value. Table 5 shows the importance value and utility estimation.

Table 5. Utility Estimate and Importance Value

Attribute	**Level**	**Utility Estimate**
Flavor (23.087)	Original Chocolate	0.091
	Caramel Chocolate	0.045
	Hazelnut Chocolate	-0.025
	Dark Chocolate	-0.112
Serving Condition (21.617)	Normal Ice	0.272
	Less Ice	0.094
	No Ice	-0.366
Cup Size (13.592)	Small	-0.025
	Medium	0.066

	Large	-0.041
Topping (29.426)	Pudding Jelly	0.094
	Bubble	-0.036
	Ice Cream	0.168
	Cream Cheese	-0.120
	Oreo	-0.106
Health Benefits (12.279)	No Preservatives	-0.020
	Low Sugar	0.035
	Low Calorie	-0.015
(Constant)		3.509

Table 5 shows that the importance value of each attribute in chocolate drink products. The first attribute that is considered important by respondents in this chocolate drink product is topping with a value of 29,426. The high value obtained on this attribute indicates that the topping provides its own uniqueness for respondents in chocolate drinks. Consumer preferences for topping attributes, specifically ice cream, rank first with a utility estimate value of 0.168, followed by jelly pudding in second rank with a utility estimate value of 0.094, bubble in third rank with a utility estimate value of -0.036, oreo in fourth rank with -0.106, and cream cheese in fifth rank with a utility estimate value of -0.120.

The taste attribute which has value of 23,087 is the second attribute that is considered important by respondents when buying chocolate drink products. Consumers consider taste as one of the most important factors in deciding whether to buy chocolate beverage products or not (Purba et al. 2018). Because flavor can be a unique feature of a product, it is necessary to develop a wide variety of flavors in chocolate drink products. According to customer preferences for flavor attributes, original chocolate had a value of 0.091, caramel chocolate had a value of 0.045, hazelnut chocolate had a value of -0.025, and dark chocolate had a value of -0.112.

Furthermore, respondents consider drink state to be the third most important attribute when buying chocolate beverage products. This characteristic's importance value is 21,617, which is close to the value obtained for the flavor attribute. Consumer preferences for the state of presentation of chocolate drink products include a drink with 0.272 normal ice, 0.094 less ice, and no ice of -0.366.

With an importance value of 13,592, the cup size attribute is ranked fourth among the attributes that respondents consider important when buying chocolate beverage products. The most preferred cup sizes are medium (0.066), small (-0.025), and large (-0.041), according to consumer preferences.

The fifth attribute that is considered important by respondents in buying chocolate beverage products is the health benefits attribute with an importance value of 12,279. The health benefits lie in the last attribute because there are indeed many current drinks circulating that are not too concerned with the health content in them. However, based on consumer preferences, many respondents prefer and want to consume chocolate drinks with low sugar composition, which have a utility estimate value of 0.035, while low-calorie has a utility estimate value of -0.015 and no preservatives has a utility estimate value of -0.020.

Based on the utility estimate value obtained from the processing of conjoint analysis using SPSS for each level of each attribute, it is also possible to calculate the total utility value of each product combination. If the total utility obtained is higher, it can be concluded that the combination of chocolate drink products is becoming more popular or preferred by respondents. In this study, the total utility of each combination of chocolate drink products will be calculated based on the results of the product combination in Table 4.

Table 4 shows that the first combination of chocolate beverage products consists of a combination of caramel chocolate flavor, drink state with less ice, small cup sizes, jelly pudding topping and contains low-calorie. An example of calculating the total utility value for the first product combination can be seen as follows:
U1 = constant + utility caramel chocolate + utility less ice + utility small cup + utility pudding jelly + utility low calorie
U1 = 3.509 + 0.045 + 0.094 + (-0.025) + 0.094 + (-0.015)
U1 = 3.703

The constant and utility values for each level in each attribute were obtained from the output utilities in conjoint analysis processing using SPSS software which can be seen in Table 6. The total utility calculation was also carried out for the whole combination of chocolate drink products. After that, each product combination will be ranked according to the total utility value obtained to find out which product combination the respondents are most interested in. The recapitulation of the total utility value calculation for each combination of chocolate beverage products is shown in Table 6.

Table 6. Recapitulation of Total Utility Value for Each Product Combination

Product Combination	Total Utility	Ranked	Product Combination	Total Utility	Ranked
1	3.70	10	14	3.67	12
2	3.92	3	15	3.82	8
3	2.94	25	16	3.58	17
4	3.59	16	17	3.62	14
5	3.86	5	18	3.68	11
6	3.84	7	19	3.09	24
7	3.56	18	20	3.92	4
8	4.09	1	21	3.65	13
9	3.36	21	22	3.85	6
10	3.61	15	23	3.42	20
11	3.16	23	24	3.73	9
12	3.31	22	25	3.92	2
13	3.43	19			

4.3 Determine of Standard Modules with DEMATEL Method

The development of chocolate drink products with multiple alternative product combinations, as shown in Table 4, can be said to be a modular product because it is formed up of numerous attributes. To create a modular product, it is necessary to have a module (Gustianda 2013). In the development of food or beverage products, modules usually consist of one or more attributes (Wedowati et al. 2020).

The DEMATEL approach is used to determine the module in the development of chocolate beverage products by analyzing the relationship that exists between each attribute. The attributes analyzed are those that consumers value, including as flavor, topping, serving conditions, cup size, and health benefit.

The data is taken based on the perception of experts who are knowledgable with this chocolate drink. The data was then analyse using the DEMATEL method to determine the relationship between the chocolate drink product's attributes. Figure 1 shows the relationship between attributes.

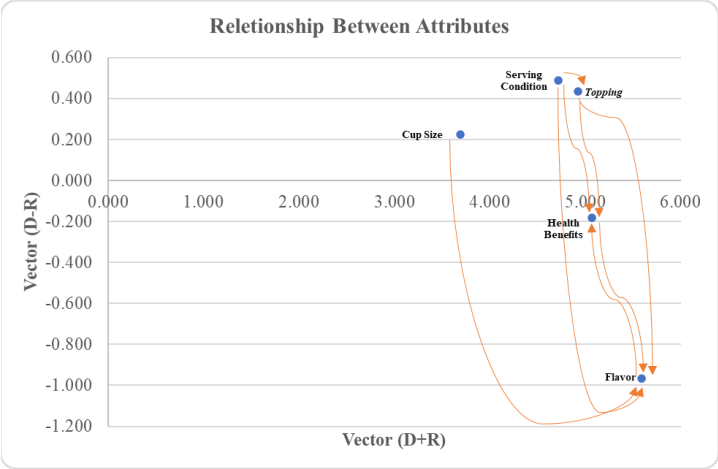

Figure 1. Relationship Between Attributes

The standard module is useful in the production of chocolate beverage products since it allows for the development of several product variations, as shown in Table 4. Based on the alternative product variations, it can be seen that chocolate beverage products can be made from various attributes. As a result, the module must be designed to make the production of a variety of chocolate drink products easier. It is necessary to analyze the relationship that exists between the attributes of chocolate drink in order to obtain the appropriate standard module.

Figure 1 shows the relationship between flavor and health benefit attribute. As a result, flavor and health benefit attribute can be merged into a single module called the beverage module. There is no relationship between the topping attribute, serving condition, and the cup size, so that each attribute can build its own module. Table 7 shows the overall recapitulation of the types of modules and variants contained in the modules created.

Table 7. Chocolate Drink Module

Module	Module Variant
Beverage Module	Original Chocolate, No Preservatives
	Original Chocolate,Low Sugar
	Original Chocolate,Low Calorie
	Caramel Chocolate, No Preservatives
	Caramel Chocolate, Low Sugar
	Caramel Chocolate, Low Calorie
	Hazelnut Chocolate, No Preservatives
	Hazelnut Chocolate, Low Sugar
	Hazelnut Chocolate, Low Calorie
	Dark Chocolate, No Preservatives
	Dark Chocolate, Low Sugar
	Dark Chocolate, Low Calorie
Topping Module	Pudding Jelly
	Bubble
	Ice Cream
	Cream Cheese
	Oreo
Serving Condition Module	Normal Ice
	Less Ice
	No Ice
Cup Size Module	Small
	Medium
	Large

5. Conclusion

The attributes that are considered important obtained related to the development of chocolate drink products consist of attributes of flavor, topping, serving condition, cup size, and health benefit. The flavor attribute consists of four levels, the topping attribute consists of five levels, the serving condition attribute consists of three levels, the cup size attribute consists of three levels, and the health benefit attribute consists of three levels. As a result, a standard module is required to ease the production of chocolate beverage products with the concept of mass customization. The beverage module, the topping module, the serving condition module, the cup size module, and the health benefit module are the four modules utilized in the development of chocolate drink products.

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