

Dimsum Product Packaging Design Proposal Based on Customer Desires Using the Quality Function Deployment (QFD) Method

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Abstract: The current era of globalization, competition between companies to reach consumers is very tight. Therefore, many companies are starting to think about effective strategies that can attract consumers to buy their products. Identifying the analysis of technical characteristics of needs and design proposals in problems in increasing sales of dimsum products. Especially in packaging using the Cronbach alpha method, and House of Quality and Quality Function Deployment based on the characteristics of quality dimensions with a level of importance such as the type of material used 500 grams, and 800 grams in plastic polyvinyl chloride and low density polyethylene are heat resistant with dimensions of length, width, and height (190x91x61 Millimeters) in innovation in the cover section in keeping food clean, hygienic, and free from dirt or dust. The purpose of this study is to identify the need for the use of dimsum packaging products desired by customers, Analyze the characteristics of consumer needs regarding dimsum packaging products based on customer desires.

Keyword: Product Planning, Product Design, Dimsum Packaging, Alpha Cronbach, House of Quality, Quality Function Deployment.

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I. INTRODUCTION

In today's era of globalization, competition between companies to reach consumers is very tight. Therefore, many companies are starting to think about effective strategies that can attract consumers to buy their products. One way for companies to attract consumers is by using attractive packaging. If in the past packaging was not a major concern, now many food and beverage companies are starting to focus on the beauty, uniqueness, convenience and attractiveness of a product's packaging, because this can influence consumer buying interest.

Currently, product packaging has become an important thing. Packaging no longer only functions as a container for wrapping food or beverage products to avoid dirt, dust, air, impact and sunlight, but also as a promotional tool and attracting buyers. Packaging is the most important factor. It is further concluded that packaging elements such as Color, Packaging Material, Packaging Design and innovation are more important factors when consumers make purchasing decisions [1]. In addition, packaging can attract consumers' attention to certain brands, increasing image, and stimulate

consumer perception of the product. Then, packaging also conveys the unique value of a product. Packaging also serves as a tool for differentiation and helps consumers decide on products from a variety of parallel products, and packaging also stimulates customer purchasing behavior [2].

Competition occurs in various sectors, both service and non-service industries. One of them is the food industry, competition in this one business is quite high and interesting to discuss because in some communities, using this product is a daily need, especially dimsum in packaging.

Food packaging materials that are not harmful and release contaminants that are harmful to public health in packaging as a complement to food consumed by the public, so that this causes competition between various companies to create various increasingly diverse flavor variants in one package in the Indonesian national standard regarding food safety from dimsum products can affect the level of consumer purchasing decisions [3].

Dimsum products are made from chicken with various flavor variants. The flavor variants offered such as smoked

beef, mushrooms, shrimp, and carrots with the selling price of dimsum products is also very affordable which can steal the attention of consumers. not only that, this dimsum product can be said to be cheap dimsum with a taste that is no less competitive than other dimsum products.

Dimsum products have plain or simple and unattractive packaging. Even with other dimsum products, using different packaging can affect consumer purchasing decisions. This shows that competition between dimsum brands in packaging is getting tighter. Facing this reality. Many companies pay close attention to the packaging of a product because they assume that the function of packaging is not only as a wrapper, but much broader than that. If the seller/producer pays attention to these functions, then the smooth sale of goods can be expected.

The problem with the current packaging is considered less than ideal. The raw material used is polyethylene terephthly which is not heat resistant. With this material it is not strong enough to withstand the product from shocks and impacts (soft). As a result, the product is easily destroyed. So it is necessary to improve the current packaging.

The Quality Function Deployment (QFD) method is a technique used to translate consumer needs into product characteristics and consider the company's ability to meet them [4]. While QFD (Quality Function Deployment) is a structured method used in the product planning and development process to determine the specifications of customer needs and desires, and evaluate a product in meeting customer needs and desires, and systematically evaluate the capabilities of a product or service in meeting customer needs and desires [5].

The use of the QFD method certainly functions to determine the technical characteristics of the consumer [6]. The purpose of this method is to anticipate, determine the highest level of customer desires, and unite customer desires and needs [7].

Researchers can conclude that the Quality Function Deployment Method is a product planning and development method that integrates the characteristics of consumer needs with technical characteristics and pays attention to competitor products.

The stages of the QFD method are 1. knowing the needs and desires of consumers so that the products produced can meet the level of good quality according to what consumers want. 2. Developing technical characteristics that meet consumer desires and product development techniques and comparing similar competitor products. 3. Analyzing competitors for similar products. 4. Determining product development priorities [8].

Primary packaging classification is packaging material that directly contains food such as milk cans, beverage bottles, tempeh wrappers. While secondary can protect other packaging groups, such as cardboard boxes for milk cans,

wooden boxes for wrapped fruit containers, and tempeh baskets [9].

Based on the results of field research, it can be seen that the reference product has shortcomings in the form of material in the product is Plastic polyvinyl chloride, so this material is easily damaged due to not being heat resistant, not flexible (size that cannot be determined), and its capacity is not large and large. And the price is not affordable, it is necessary to improve the product by developing existing packaging. With the Quality Function Deployment method, it can be concluded that it is expected to maximize the quality of existing dimsum packaging such as heat-resistant materials and innovate in the form of lids according to the Indonesian National Standard 7323 in 2008 [10].

Good product development can improve the quality of a product itself in meeting user needs. Furthermore, designing the product through several processes using the House of Quality (HOQ) technique [11].

II. RESEARCH METHODS

➤ Research Framework

The framework of this study focuses on the purpose of designing dimsum packaging. The stages of designing dimsum packaging are based on the ideal specification values obtained from consumer needs. Consumer need attributes are translated into technical characteristics which are then used to determine new packaging concepts. This framework can be seen on the next page in Figure 1. Dimsum Packaging Product Relationship Diagram.

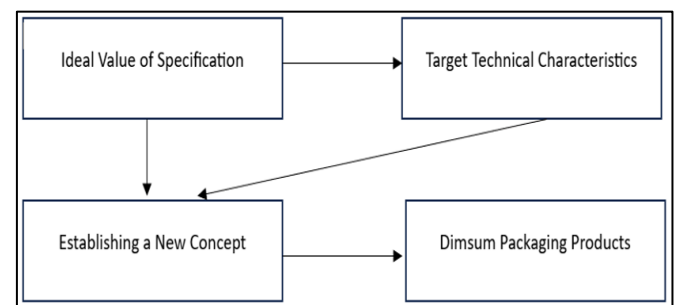


Fig 1 Dimsum Packaging Product Relationship Diagram

➤ Research Methodology Flowchart

Research Methodology is a discussion of the science of the methods that will be used in a study from before identifying the problem to solving the problem. Good and correct research stages will affect the results of the discussion. Therefore, the author uses a Flowchart, so that it can display and describe systematically from start to finish what will be done. The following is Figure 2. Flowchart of Dimsum Packaging Design Research

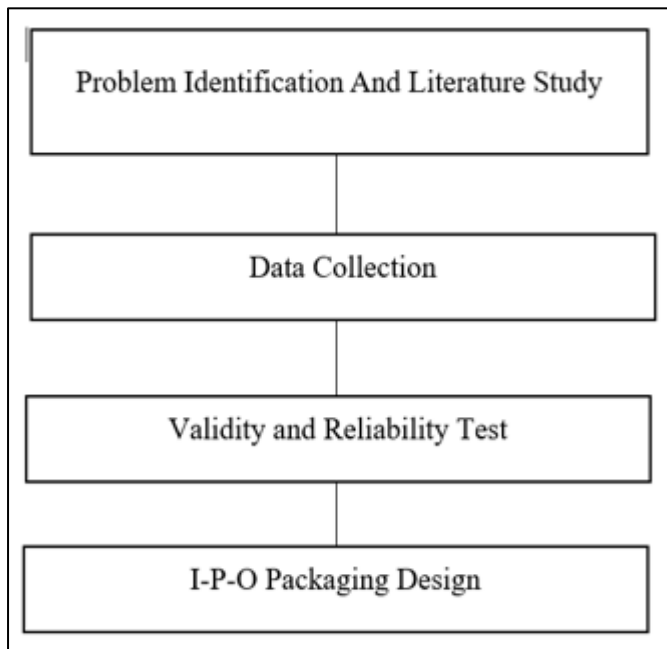


Fig 2 Flowchart of Dimsum Packaging Design Research

III. RESULTS AND DISCUSSION

A. Data Collection

➤ Product Description Dimsum Packaging Reference

Reference products are products that are used as a reference to develop a product. So that it has specifications of material, size, and features. The following is Figure 3. Dimsum Packaging Reference Products.



Fig 3 Dimsum Packaging Reference Products

Based on Figure 3. The reference product of dimsum packaging has a weakness that is easily dented or damaged in consumers buying dimsum products because the length is 5 cm and the width is 7 cm and the height is 5 cm and the material is made of PE plastic.

The data collection stage is first determined by the respondents as the source of closed and open questionnaire data. The following on the next page is Table 1. Form of open questionnaire questions and Table 2. Form of Closed Questionnaire Questions

Table 1 Form of Open Questionnaire Questions

OPEN-END QUESTIONNAIRE ON DIMSUM PACKAGING PRODUCTS		
Do you sell or consume dimsum products?		
Yes, I sell or consume dimsum products		
No		
Respondent Identity		
Name :		
Age :		
Work :		
Gender :		
Please give a polite and good opinion on the statement below regarding the quality of dimsum packaging products.		
No	Statement	Respondent's Opinion
1	In your opinion, what kind of material is suitable for the durability of this dimsum packaging product? (Example: Plastic, paper, wood)	
2	In your opinion, what shape is appropriate for the use of dimsum packaging products that are already on the market? (Example: Round, Square, Rectangular)	
3	In your opinion, what size is appropriate for the ease of carrying anywhere by sellers or consumers of dimsum packaging products that are already on the market? (Example: Large, Small)	
4	In your opinion, what additional features are appropriate for the basic use of dimsum packaging products that are already on the market? (Example: Lid, Handle)	
5	In your opinion, what material is appropriate for the reliability of this dimsum packaging product? (Example: Heat Resistant, Waterproof)	

Based on Table 1. The form of the Open Questionnaire Questions in the data collection technique is in the form of giving full freedom to 98 respondents to answer them regarding dimsum packaging products that have been distributed online via Google Form.

Table 2 Form of Closed Questionnaire Questions

CLOSED QUESTIONNAIRE ON DIMSUM PACKAGING PRODUCTS						
Respondent Identity						
Name :						
Age :						
Work :						
Gender :						
Put a "v" mark on the statements you agree with.						
No	Statement	Mark				
		1	2	3	4	5
1	Innovation product of dimsum packaging made of plastic material					
2	Innovation product of dimsum packaging has a box design					
3	Innovation product of small-sized dimsum packaging					
4	Innovation product of dimsum packaging has additional features in the form of a packaging cover					
5	Innovation product of dimsum packaging has heat-resistant material properties					
Description :						
: Strongly Disagree						
: Disagree						
: Undecided						
: Agree						
: Strongly Agree						

Based on Table 2. The form of the Closed Questionnaire Questions using a Likert scale in the form of several alternative assessment answers from code one, namely doubtful, code two, namely strongly disagree, code three, namely doubtful, code four, namely agree, code five, which means strongly agree.

Respondents who answered the open and closed questionnaires were 98 and 30 people with five questions asked to find out the desire for the quality dimensions of the innovation product. The following is Table 3. Conclusion of the Results of the Open Questionnaire and Table 4. Conclusion of the Results of the Closed Questionnaire.

Table 3 Conclusion of Open Questionnaire Results

Quality Dimensions	Questions	Answers	Total
<i>Durability</i>	Type of packaging material	Paper	32
		Plastic	58
<i>Performance</i>	Packaging size	Large	40
		Small	50
<i>Aesthetic</i>	Packaging shape	Box	62
		Round	28
<i>Feature</i>	Additional packaging features	Lid	60
		Handle	30
<i>Reliability</i>	Properties of packaging material	Heat Resistant	61
		Water Resistant	29

Based on Table 3. Conclusion of the Results of the Open Questionnaire in the form of questions regarding the quality dimensions of dimsum packaging, a total of 98 respondents answered, such as the type of material, 58 of whom chose

plastic, what size of dimsum, 50 of whom chose small, what shape, 70 of whom chose box, what additional features should be there, 60 of whom chose a lid, and what material, 69 of whom chose heat resistant.

Table 4 Conclusion of Closed Questionnaire Results

No	Statement	Mark				
		1	2	3	4	5
1	Innovation product of dimsum packaging made of plastic material	0	3	8	4	15
2	Innovation product of dimsum packaging has a box design	0	3	7	7	13
3	Innovation product of small-sized dimsum packaging	0	0	2	13	15
4	Innovation product of dimsum packaging has additional features in the form of a packaging cover	0	0	2	11	17
5	Innovation product of dimsum packaging has heat-resistant material properties	1	0	1	9	15

Based on Table 4. Conclusion of the Closed Questionnaire above using a Likert scale based on the quality dimensions selected by 30 respondents with small size, plastic material, box design, additional cover features, heat-resistant material properties of the innovation product.

B. Validity and Reliability Test

➤ Validity Test

Validity test is a test used to test the accuracy of a measuring instrument in measuring something that should be

measured [12]. With the aim of finding out whether the data is valid before reliability is carried out [13].

In this study, the test applied was using a real level value of 0.05. Validity testing can be done by comparing the r table value for the degree of freedom (df) value = N-2 with sig 5% in this case N is the number of samples [14], This validity test uses data from 30 of 98 respondents, then the results are used as input to be processed with SPSS 16.00 for analysis. The following is Figure 4. Output Correlations 30 Respondents.

		Correlations					
		pernyataan1	pernyataan2	pernyataan3	pernyataan4	pernyataan5	total
pernyataan1	Pearson Correlation	1	.609**	.822**	.396*	.136	.806**
	Sig. (2-tailed)		.000	.000	.030	.475	.000
	N	30	30	30	30	30	30
pernyataan2	Pearson Correlation	.609**	1	.831**	.520**	.288	.824**
	Sig. (2-tailed)	.000		.000	.003	.123	.000
	N	30	30	30	30	30	30
pernyataan3	Pearson Correlation	.822**	.831**	1	.476**	.237	.893**
	Sig. (2-tailed)	.000	.000		.008	.207	.000
	N	30	30	30	30	30	30
pernyataan4	Pearson Correlation	.396*	.520**	.476**	1	.828**	.781**
	Sig. (2-tailed)	.030	.003	.008		.000	.000
	N	30	30	30	30	30	30
pernyataan5	Pearson Correlation	.136	.288	.237	.828**	1	.590**
	Sig. (2-tailed)	.475	.123	.207	.000		.001
	N	30	30	30	30	30	30
total	Pearson Correlation	.806**	.824**	.893**	.781**	.590**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.001	
	N	30	30	30	30	30	30

** . Correlation is significant at the 0.01 level (2-tailed).
* . Correlation is significant at the 0.05 level (2-tailed).

Fig 4 Output Correlations 30 Respondents.

Based on the results of the SPSS software calculations on the previous page, a correlation coefficient was obtained which was used to measure the level of validity of an item and to determine whether an item was suitable for use or not. The method used in this validity test is Pearson product moment. Determining whether or not an item is suitable for use is usually done by testing the significance of the correlation coefficient at a significance level of 0.05, meaning that an item is considered valid if it correlates significantly with the total score. The criteria for a question item are said to be valid if the correlation value is > the correlation table in the Pearson

correlation table. The conclusion from the output image above is that all statement data 1 to the total score is greater than the Pearson correlation table value of 0.374 (30 data) then the data can be said to be valid

➤ Reliability Test

Reliability Test is a test used to determine whether the questionnaire used in the data collection process in research is reliable or not [15]. Researchers conclude that the reliability test is a measurement of the consistency of the questionnaire results if the measurement is repeated. Reliability describes the

extent to which a test can be trusted to have a relatively unchanged score.

The purpose of the reliability test is to ensure that the questionnaire we compile will be really good at measuring symptoms and producing valid data. The following is Figure 5. Output Case Processing Summary.

Case Processing Summary			
		N	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0
a. Listwise deletion based on all variables in the procedure.			

Fig 5 Output Case Processing Summary

Figure 5. *Output Case Processing Summary* above shows the total cases tested and the number of valid case values. The valid case value gets an N result of 30.

The total on the output of the case processing summary gets a result of 100%, The method used is cronbach's alpha because it is used to measure the reliability of the indicators used in the research questionnaire. The following is Figure 6. Reliability Statistic 30 Respondents.

Reliability Statistics	
Cronbach's Alpha	N of Items
.821	5

Fig 6 Reliability Statistics of 30 Respondents

Based on Figure 6. Reliability Statistics on the previous page, the Cronbach's alpha value was 0.821. This figure is greater than the minimum Cronbach's alpha value of 0.612 ($0.821 \geq 0.612$), which means that the data is declared reliable.

➤ House of Quality (HOQ)

Based on the collection of data on the technical characteristics of dimsum packaging products. Then researchers can create a house of quality. The following is Figure 7. House of Quality.

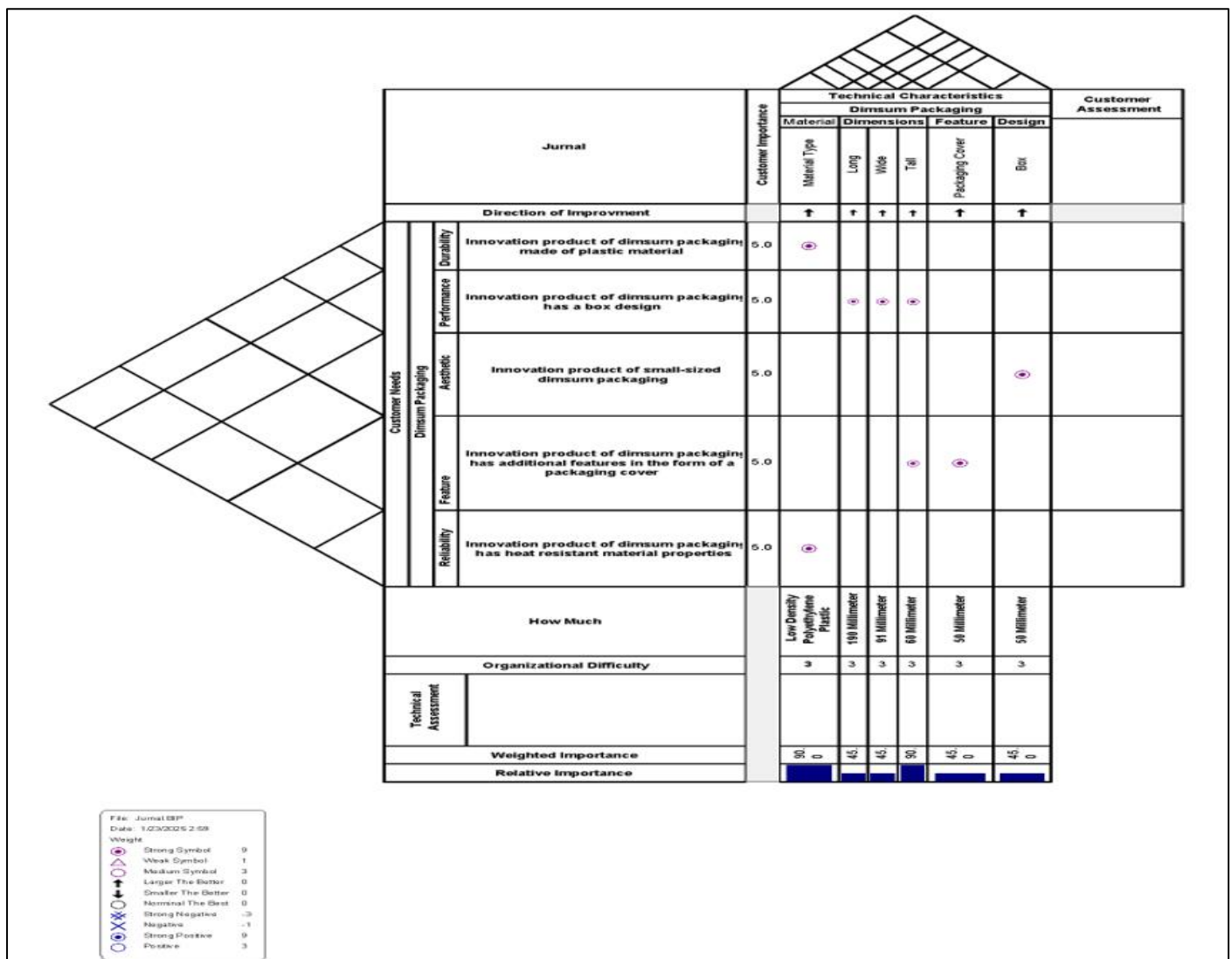


Fig 7 House of Quality

The output of the house of quality that has been processed using QFD Designer 5 software has various parts that are interconnected with each other. The following is an analysis of the house of quality matrix for Dimsum Packaging products.

Customer needs desired by customers from questionnaires such as quality dimensions in innovative dimsum packaging products in the form of plastic materials that are stronger than paper (durability), small capacity because they can expect to save more space when stored (performance), in the form of a box design so that it can be arranged more neatly (reliability), a cover as an additional feature with the aim of remaining sterile from unwanted things (features), and is a heat-resistant material so that it does not break when used (aesthetic).

➤ I-P-O Packaging Design

This dimsum packaging product innovation is in the form of a cover made of low density polyethylene (LDPE) plastic. So that the advantages it has in terms of making it easy for consumers to carry anywhere with heat resistance and low price, the I-P-O diagram here functions to differentiate the level of system detail. Below is Figure 8. I-P-O Diagram

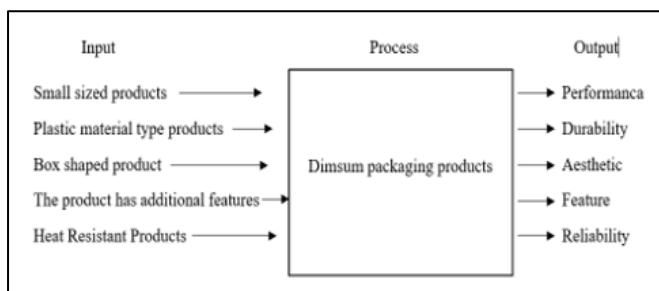


Fig 8 I-P-O Diagram.

➤ Dimsum Packaging

The product is prototyped from the House Of Quality (HOQ) results using CATIA software, so that the product description can be seen visually. The following is Figure 9. 3D Design of Innovation Products.

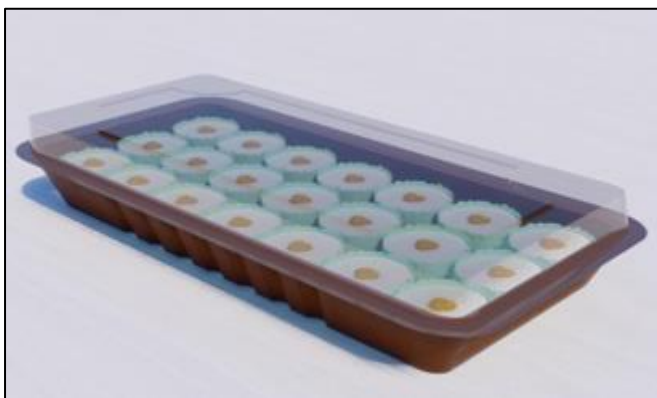


Fig 9 3D Design of Innovation Product

Figure 9. 3D Design of Innovation Product shows dimsum packaging. Furthermore, to find out the size, you can see it by making a 2D version of the product using drafting on CATIA software.

IV. CONCLUSION AND SUGGESTIONS

The following are the conclusions obtained regarding Dimsum packaging products, namely the identification of the needs of users of dimsum packaging products desired by customers based on the results of the questionnaire distribution are the type of plastic material, small size capacity, additional features in the form of a cover, and are heat-resistant materials.

Analysis of the technical characteristics of consumer needs for dimsum packaging products based on customer desires includes a comparison of reference products with innovation products from each quality dimension characteristic with a level of importance such as the type of material used is polyvinyl chloride plastic and low density polyethylene which are not heat resistant, and heat resistant and the size capacity is larger with the addition of features in the form of a cover so that food becomes more hygienic and clean from dirt or dust.

The proposed design of dimsum packaging products using the Quality Function Deployment (QFD) method is the type of material that is, size capacity, and additional features used are low density polyethylene plastic weighing 800 Gr which is heat resistant, size capacity Length, width, height (190x91x60) mm, and additional features in the form of a cover in the innovation product.

External search to produce solutions by collecting information from reference sources, internal search to produce designs in the form of additional features to existing futuristic designs.

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