



Product Development of Klikpak Food Packaging with Quality Function Deployment (QFD) Method

Euis Nina Saparina Yuliani*, I Gusti Ayu Arwati, Ahmad Riva Riski

Industrial Engineering Program, Engineering Faculty, Universitas Mercu Buana
Mechanical Engineering Program, Engineering Faculty, Universitas Mercu Buana
Email*: nina.yuliani@mercubuana.ac.id

Abstract A food packaging serves to protect food from damage, especially from the nature of the food that hot, contain oil and gravy moreover protects from the weather, sunlight, shocks, collisions with other objects. Expectations of consumers against food packaging can protect food from various risks from the outside. The material paper used has properties of food-grade and greaseproof, which can protect the packagings from the properties of foods that oily and heat. One of the packaging of food products that are currently circulating in the market is klikpak, which is used to package food such as rice, pasta, spaghetti, noodle, potato, salad and so forth, with the type of packaging folding box white paper. This food packaging uses a manual gluing system using glue so that the power of the click or lockdown on the package lid is less robust, this can cause food to spill easily (fallen). Selling price is also included is quite expensive due to the long production process. Therefore, it is necessary to develop innovative packaging design that can protect food well and have an effective and efficient function in its use. The purpose of this research is to develop the klikpak food packaging design with the Quality Function Deployment (QFD) method, through the development of the House of Quality (HoQ) which is the first level of QFD, and to apply the ergonomic principle of effective, safe, healthy, comfortable, and efficient. House of Quality (HoQ), aims to translate customer requirements directly against technical requirements or technical specifications of the product produced. The results of this research are that there are 12 product attributes that become customer requirements, as well as 5 technical requirements. Based on the priority of weight and relative of weight, the order of priorities consists on the 5 items: (1) Improve the quality, (2) planning the draft pattern, (3) planning of cost Estimation, (4) Paper material selection, (5) Planning new product development process.

Keywords Product design, Customer Requirements, QFD, HoQ

Introduction

Product development lies in customer satisfaction, namely various food producers companies. A packaging company, usually serving the food packagings ordered up to the folding box white paper that are in the form of a prototype, after being approved by the food company, it will then be processed until mass production.

One of the packaging of food products that is currently circulating in the market is klikpak, which is used to package food such as rice, pasta, spaghetti, noodle, potato, salad and so forth, with the type of packaging folding box white paper. The Klikpak pictures are shown in Figure 1 and 2.

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Product development or packaging product innovation is the heart or activity center of each packaging manufacturer because development plays an important role in the continuity of the company, as well as the management of all activities, such as idea formation, technological development, manufacturing processes and marketing of new products or developed products [1].

The Quality function Deployment (QFD) method is a structured methodology that can be used in the process of product planning and development to establish specifications of consumer needs and desires, and systematically evaluate the capabilities of a product to meet consumer needs and wants [2-5].



Figure 1: Packaging klikpack (existing) closed position

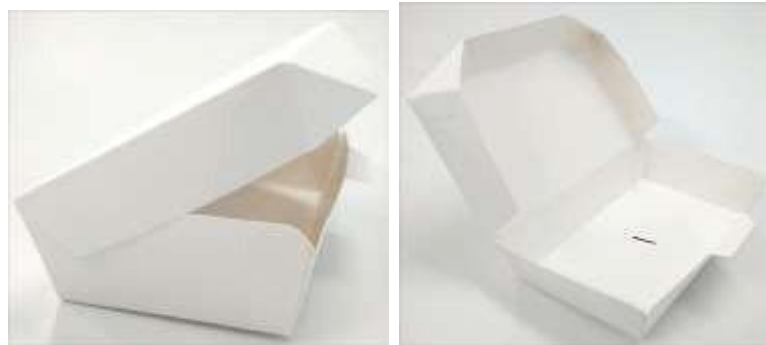


Figure 2: Packaging klikpack (existing) open position

Cohen (1995) in Herwanto, Ikatrinasari, & Yuliani [6] defines Quality Function Deployment is a structured method used in the process of planning and product development to define the needs of specifications and consumer desires, and the systematic evaluation and ability of a product or service to meet the needs and desires of consumers.

According to Tjiptono in Yuliani & Ikrima [7], QFD seeks to translate what customers need into what the company produces. QFD allows a company to prioritize customer needs, find innovative responses to those needs, and improve processes to achieve maximum effectiveness. The QFD structure is usually described in House of Quality (HoQ).

Several previous studies using the Quality Function Deployment (QFD) method, Patil et al. [2] researched about the design of helical spring, where the result was that the company had to reduce production costs by optimizing the type of material. Tsai et al. [8] designed a tool to drive a wheelchair, Power-assisted wheelchair (PAW), where the results of this study, stated that QFD can be used to improve the quality of design, taking into consideration consumer wants and satisfaction. This tool can increase the efficiency of a manual wheelchair, making it easier for patients to move the wheel and not get injured due to continuous use.

Based on the background above, the purpose of this research is to develop a klikpack food packaging design with the Quality Function Deployment (QFD) method, through the development of the House of Quality (HoQ) which is the first level of the QFD that aims to translate customer requirements directly to the technical requirements or technical specifications of the products produced, and apply the principle of ergonomic effective, safe, healthy, comfortable, and efficient.

Materials and Methods

Type of Research, Subject & Object Research

The basic method used in this research is a descriptive method, which is done to know and explain the characteristics of variables examined in a situation, aiming to provide an overview of the relevant aspects of The phenomenon of problems, individual perspective, organization, orientation, etc [9]. In translating product



planning and development using a qualitative method where data is generated from broad answers to specific questions in interviews, or from responses to open questions in questionnaires, through observation or from information from various pre-existing sources [9].

The object and subject of the research specified in the study are packaging products of klikpak type folding box white paper developed by packaging company. While the specified subject is the food packaging manufacturer user packaging The Klikpak model (population) and its consumers (food connoisseur with Klikpak packaging) (respondent).

Data Collection Methods

The methods of collecting data on this research include:

(a) Field Studies Include observation on the field or preliminary observations about the development of packagings at packaging company, with the aim to obtain any specification required by the consumer and to have a system of capabilities in hopes of being able to meet the needs of customers and consumers.

(b) An interview to the related parties in which the interview is used as a data collection technique. In this research, the interview was conducted through of data collection by conducting direct questions with the company, food producers, and Consumer [10].

(c) Determining the Questionnaire Variables where the characteristics of consumer needs for the development of bucket rice packaging products will be used for the preparation of questionnaires in research so that the attributes that will be used for questionnaire questions will later [11]. The statement/question attributes shown in Table 1 are:

Number	Variable	Product Measurement	Item Dimensions Scale	Question Attribute	Measurement Number	Instrument
1	Product Quality [12]	Performance	1	Ease when opening and closing packages	Interval	Questionnaire
		Feature	2	Easy to carry	Interval	Questionnaire
			3	Complete locking feature		
2	Product Quality [13]	Durability	4	Packaging is stronger	Interval	Questionnaire
			Product Prices	5	Price adjustments with materials and manufacturing	Interval
		Product Design	6	Cheaper prices	Interval	Questionnaire
			7	Innovative and ergonomic packaging design		
		8	Easy to design packaging designs	Interval	Questionnaire	
		9	Good packaging quality			
Product Quality Product Material	10	Material with food grade labeled paper	Interval	Questionnaire		
	11	Paper packaging material is safe	Interval	Questionnaire		
	12	Paper materials are easily recycled				

The results of the Focus Group Discuss (FGD) of consumer needs were identified through the distribution of open questionnaires to obtain 12 underlying attributes in product development. Based on observations of 40 respondents and recapitulation of data, 12 customer needs with characteristics were obtained customer, identification of statement attributes shown in Table 2 are:

Table 2: Result of Statement Attribute Identification

Number	Statement Attribute Identification Results
1	Convenient packaging when opened and closed by customers and consumers
2	Convenient packaging when carried by consumers
3	Development of packaging with locking models on clicking packaging
4	Packaging is stronger when filled with food with locking on the packaging
5	The price of packaging adapts the materials used and the manufacturing process (packaging manufacturer)
6	Cheaper prices than competitors to be able to increase the price of packaging Clickpak
7	Innovative and ergonomic packaging design can attract consumer attention
8	Easy-to-form packaging designs that are easier and more convenient for packaging use in food
9	In developing good quality packaging, it is able to provide trust to customers and consumers
10	Paper materials are licensed for food grade labels to provide food manufacturers with confidence in the food to be packaged
11	Material safe paper is a type of paper that can protect from the nature of foods that contain oil, heat, and berkuah.
12	Food packaging using paper makes the recycling process easier and reduces global warming

(d) Distribution of Questionnaires where data collection techniques are through forms that contain questions submitted in writing to a person or group of people to get answers or responses and information needed by researchers [14].

Library Studies are conducted by searching for books, journals and publications to obtain written theories and methods of data collection.

Research steps

The steps of this study are as follows:

1. The research aims to develop the product of Klikpak a packaging at packaging company.
2. Literature & Field Studies conducted to collect existing theories must be sustainable with the conditions that exist in New Product Development at a packaging company
3. Observations are carried out to find out data collection through direct observation or careful and direct review of employment,
4. Data collection is implemented to translate the specification of consumer needs and desires.
5. Data processing using Quality Function Deployment (QFD) method,
6. Prototype form making a product that displays technical drawing and Design Artwork,
7. Analysis & discussion is conducted to analyze & discuss the results of data processing,
8. Conclusions and Suggestions results of data processing analysis on product development.

3. Results and Discussion

Develop Quality Function Deployment (QFD) phase I

The method of Quality Function Deployment Phase 1 or named House of Quality (HoQ) is a product planning phase that will be developed and adapted to the technical response based on FGD between researchers and the company team. This stage of House of Quality (HOQ) consists of customer requirements (Customer Requirements or What's) and technical response (Technical Responses or How's), which is obtained from the recapitulation questionnaire. House of quality images shown in Figure 3 below:



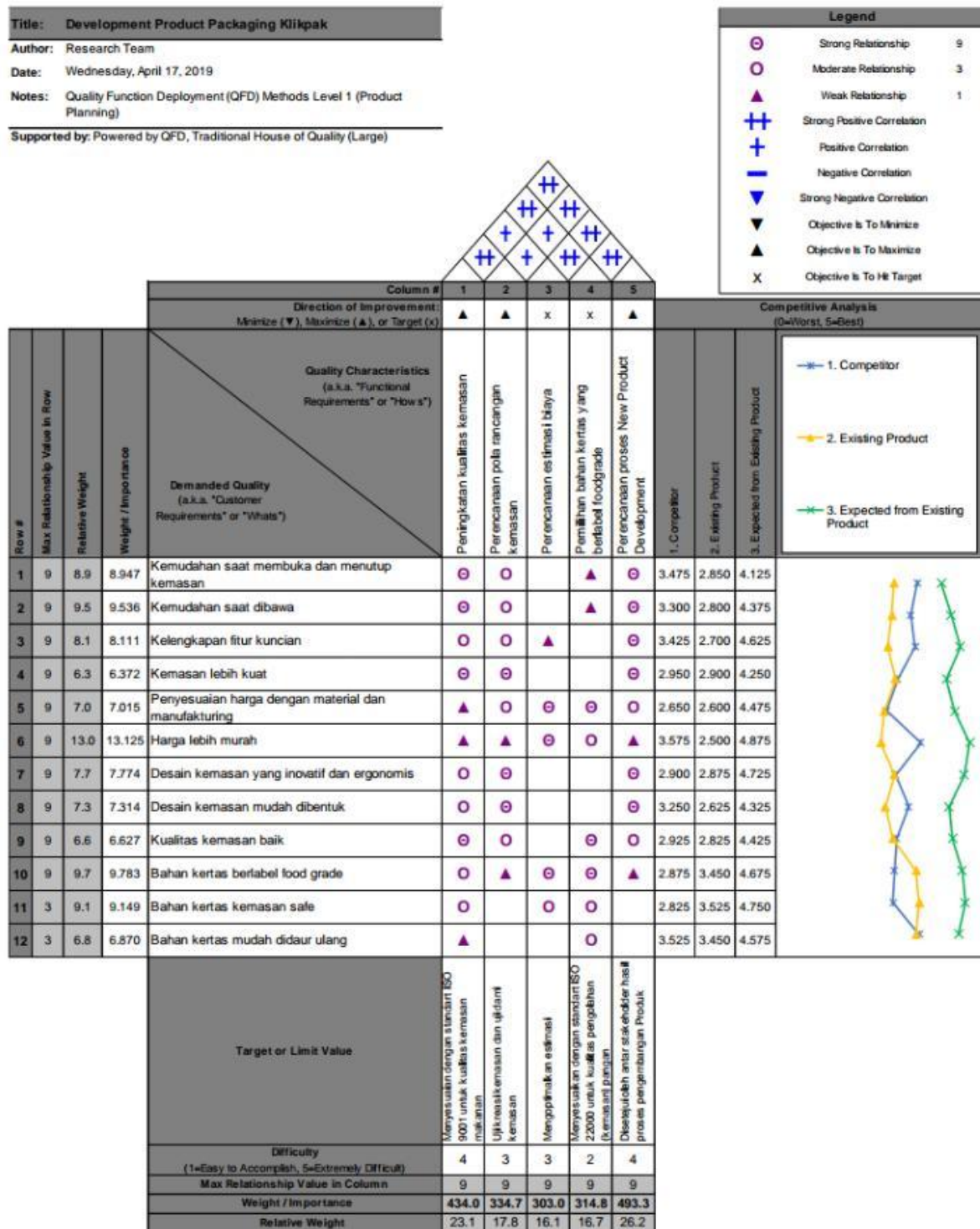


Figure 3: House of Quality (HoQ)

Based on the results of observations by distributing externally open questionnaires, external closed questionnaires, and closed external questionnaires (with a comparison of competitor products) then obtained and identified in HoQ 1 resulted in 12 attributes Products that become Customer Requirements in responding to generate 5 response/Technical requirements (technical requirement). As for HoQ 2 resulted in 5 responses/technical requirements in addressing it resulted in 7 parts characteristic (Parts Characteristics), all produced based on FGD between researchers with the packaging company team.

Conclusion

The results obtained from the Quality Function Deployment (QFD) phase I (house of quality) are 12 Product Attribute items as customer requirements and 5 technical requirements. Based on the priority of weight and relative of weight, the order of priorities consists on the 5 items: (1) Improve the quality, (2) planning the draft pattern, (3) planning of cost Estimation, (4) Paper material selection, (5) Planning new product development process.

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