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EFFORTS TO IMPROVE THE QUALITY OF BAKCANG PRODUCTS IN SURABAYA USING THE QUALITY FUNCTION DEPLOYMENT (QFD) METHOD

Maria Bernadete Mulyono[1*], Desrina Yusi Irawati[2]
Universitas Katolik Darma Cendika, Indonesia[12]
mariabhernadeta@gmail.com

ABSTRACT

Bakcang is a traditional Chinese food which is quite famous among the people of Surabaya. In the manufacturing process, bakcang still uses traditional methods using human expertise in a relationship regarding improving the quality of taste and appearance according to customer and company expectations. The stages of the Quality Function Deployment (QFD) method are carried out by making a House of Quality (HoQ) matrix. The results of the research are in the form of priority scales that must be improved for business development based on Voice of Customer. Improvements wrapping bakcang. Therefore, research was conducted to identify the quality characteristics of taste and appearance that are expected from both the consumer and company sides. The method used in this research is Quality Function Deployment (QFD). The distributed questionnaires will include the attributes of the respondent's classification, the level of importance, and the level of customer satisfaction. Then the results of data acquisition from filling out the questionnaire will be processed using the House of Quality (HoQ) method. The results of the study will show that there is to the output of HoQ are replacing packaging with other materials, providing labels as product information, making prints for more precise sizes, making cooking time guidelines so that the level of maturity is even, preparing fresh raw materials, utilizing social media, holding prices reductions, making new variations in the form of frozen, and opening new outlets with sufficient facilities.

Keywords: *interest, expectation, QFD, HoQ.*

Introduction

Indonesia is a country known for its many islands, diverse cultures and rich culinary delights. Culinary in Indonesia consists of various kinds, for example culinary home cooking, culinary specialties from each region, and other culinary specialties from certain traditions. Culinary is a processed product in the form of dishes consisting of side dishes and side dishes in the daily diet, both in the form of food and drinks[1]. One of the cities in Indonesia which is famous for its culinary variety is Surabaya. The culinary world in Surabaya is a business with good prospects. With so much public interest in the culinary world in Surabaya, it helps the culinary world in Surabaya to become more advanced. At the present time, there is a lot of public interest in traditional culinary arts, thus opening up opportunities for traditional food entrepreneurs to develop their businesses. In the tight business competition, this condition is an opportunity for entrepreneurs to create new ideas on how to maintain and increase the number of consumers[2], [3] . Basically, bakcang is a traditional food made to celebrate Bakcang Day every year. But along with the development of the times, bakcang continues to be produced every day and is used as a daily food menu. In Surabaya itself there are several well-known brands of bakcang and they are still actively producing. Bakcang is produced with a variety of fillings with the aim of adjusting to customer desires. Bakcang generally contains pork, but nowadays Bakcang has been developed to produce Bakcang filled with beef, chicken and vegetables.

Bakcang is one of the favorite foods for all people because it tastes easy to like, from small children, teenagers, adults, to the elderly. Bakcang food culinary business can be a business opportunity for anyone because the manufacturing process is easy as well as marketing is not difficult. On the other hand, there is a lot of interest in culinary dumplings, Bakcang also has its drawbacks. The shortage is in the form of products that cannot last long, so that no matter how much product is produced, the product must run out that day. However, you can prevent product spoilage by storing it in the freezer which can last up to 5 days.

Over time, the production of Bakcang Surabaya has developed both in terms of quality and marketing. However, there are also many inputs and complaints from customers about Bakcang products. Some of them are the discovery of dumplings with different levels of maturity and changing tastes of dumplings. Thus, the company certainly wants to provide the best for its customers by correcting deficiencies in its products [4]–[6]. To help find out how to improve product quality according to consumer needs and expectations, an analytical tool is used in the form of a Quality Function Deployment (QFD) in the form of a House of Quality (HoQ) [7]–[10].

This research is useful for analyzing customer needs and responses regarding Bakcang Surabaya culinary products, in terms of product appearance and quality, processing, location, to product marketing. By listening to

and understanding from the consumer and business side, it is hoped that it will be able to help improve and develop Bakcang Surabaya culinary products that meet consumer needs and consumer expectations.

Bakcang is a traditional Chinese food that is widely known in the city of Surabaya. Bakcang in general can be made of sticky rice or rice filled with chicken, pork, beef, and even vegetables. Bakcang itself is similar in shape to lontong but is triangular in shape and wrapped in bamboo leaves which is then tied with string or thread[11].

QFD is the process of determining consumer desires and interpreting them into functional attributes so that they can be understood and implemented [12]–[14]. While HoQ is a graphic technique to explain the relationship between consumer desires and products, both goods and services[15]. QFD aims to ensure that the products, both goods and services produced, meet the quality so as to meet the needs and expectations of customers [16]–[18]. The definition of Quality Function Deployment according to other experts is a system or method that aims to translate what is needed from consumers and design it into quality characteristics of a product, process, and service in order to achieve customer satisfaction [19][20]–[23]. Quality Function Deployment is carried out by identifying consumer needs and desires, calculating the level of importance and expectation, importance rating, technical characteristics, relationship matrix, column weights, and correlation matrix [10][24]–[26].

Research Methods

The research object is the target object to obtain a data which then has a value from someone who will then draw conclusions. The object of this research is one of the Bakcang Surabaya culinary businesses located on Jalan Kedungdoro. Data collection in this research activity was carried out in the following way:

1. Interviews, namely collecting data by conducting direct questions and answers with culinary business owners Bakcang Surabaya to obtain data and information.
2. Questionnaire distribution, namely by collecting response data from consumers by distributing a list of questions to respondents in the form of a Google Form. The list of questions asked aims to understand and know the needs and expectations of customers for Bakcang Surabaya culinary products. The measurement scale used in this study is the Likert scale. The Likert scale is used primarily in the field of marketing and often proves to be easy for respondents to understand in assessing a measurement attribute[27]. There is a rating scale for each answer which is divided into 5 levels on the scale, namely:
   Score 1 = very unimportant
   Score 2 = not important
   Score 3 = neutral
   Score 4 = important
   Score 5 = very important
3. Library Studies, namely by collecting data from literature books related to the problems discussed.

The population in this study were customers from culinary Bakcang Surabaya. In this study, the method used to determine the number of samples is to use the unknown population formula, meaning that it is not known how many populations of Bakcang customers are in Surabaya [7]. The formula for the unknown population method is as follows:

$$n = \frac{Z^2}{4\mu^2}$$

Information :

n = Number of samples
Z = Level sample confidence required in research (5% or determined 95% then Z = 1.96)
μ = Tolerable error rate (defined as 10% or 0.1)

By using this formula, the following calculations are obtained:

$$n = \frac{Z^2}{4\mu^2} = n = \frac{(1{,}96)^2}{4\,(0{,}1)^2}$$

$n = 96.4 \approx 96$

From the results of these calculations, a large number of samples were taken which were rounded up to 100 people to further improve the accuracy and representativeness of the data.

The reliability test is used to find out how much consistency the respondents' answers have on the importance attributes of customer needs. While the validity test is used to determine suitability in the accuracy of using attributes. And the attribute is said to be valid if it has a high correlation between the answers and the questions. In this research, the method used is Quality Function Deployment (QFD) which is then processed using the House of Quality (HoQ) method. Several stages in the Quality Function Deployment analysis are determining customer quality criteria, determining company aspects, determining score weights, determining relative importance rankings, determining critical incidents, determining competitive benchmarks, determining linkage networks with a scale ratio of 9 : 3 : 1[4].

4. Results and Discussions

Test Validity and reliability

Based on the results of the validity and reliability tests using SPSS 25 with a total of 100 respondents and a significance level of 5% and DF = 100-2 = 98. Then the R table value for n = 100 with a significance of 5% is 0.1654. The following is a table of the results of the reliability test calculations.

Table 1. Reliability test results

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based On Standardized Items	N of Items
0.708	0.748	10

From the table it can be seen that the reliability test results obtained a value of 0.748 and it can be concluded that the data is reliable data because it has a value greater than 0.60. Next, a table of validity test results will be attached.

Table 2. Validity test results

Item-Total Statistics					
	Scale Mean if Items Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Product appearance/aesthetics	85.71	41,113	0.242	-	0.703
Size Consistency	86.01	39,969	0.353	-	0.693
Maturity level consistency	85.74	40,934	0.305	-	0.699
Price level	86.11	37,998	0.510	-	0.676
Ease of opening the package	86.07	37,902	0.525	-	0.675
Product resistance level	85.86	39,113	0.463	-	0.684
New product variations	96.27	39,310	0.302	-	0.695
Product menu selection information	85.91	39,569	0.402	-	0.689
Ease of making payment transactions	85.86	38,515	0.592	-	0.676

Include expiration date	85.72	40,284	0.327	-	0.696
Amount	45.22	10,836	1,000	-	0.637

Based on the validation test table above, the R Count results are obtained from the Corrected Item-Total Correlation section which are then compared with the previous R Tables. It can be concluded that all R Count attributes are greater than R Table, then all attribute questions are valid and can be used.

Quality Function Deployment Method

Identification of consumer needs is done by taking a direct approach and then distributing questionnaires to 100 respondents who are consumers who have tried the product. From the results of the questionnaire, it can be identified that consumer desires are as follows:

Table 3. Voice of Customers

No	*Voice of Customers*
1	Product Appearance
2	Size consistency
3	Maturity level consistency
4	Price affordability
5	Ease of opening the package
6	Product Durability
7	Product Variations
8	Inform menus
9	Ease of making payments
10	Include expiration date

From the results of the Voice of Customer table, it is known that there are 10 attributes that will be used as the basis for consumer desires in the Bakcang Surabaya company. These attributes are related to product appearance, size consistency, size consistency, price affordability, ease of opening packaging, product durability, variety, menu information, ease of payment, and expiration date.

To calculate the Importance Rating value, the calculated data is the result of distributing the questionnaires. Each consumer desire is identified and calculated with a score of 1 "very unimportant" to a score of 5 "very important". The score of the scale is useful for knowing how important the desire of consumers is for certain attributes. The following is a table regarding the Importance Rating results.

Table 4. Importance Ratings

Consumer Needs	*Importance Rating*
Product Appearance	4.72
Size consistency	4.45
Maturity level consistency	4.71
Price affordability	4.33
Ease of opening the package	4.39
Product Durability	4.56
Product Variations	4.18
Inform menus	4.53
Ease of making payments	4.6
Include expiration date	4.73

From the table of Importance Rating results, the values for each attribute are obtained and the results vary based on their importance. After the consumer's interest value of each attribute is known, then the technical characteristics needed by the consumer are needed.

Technical characteristics are explanations of consumer needs in a technical form so that a product can be produced immediately. There are targets that will be set based on an analysis of the capabilities of the company itself. The technical characteristics of each consumer need are as follows:

Table 5. Technical Characteristics

No	*VOC*	Technical Characteristics
1	Product Appearance	Replace packaging with paper/plastic materials
2	Size consistency	Make molds for several sizes
3	Maturity level consistency	Create a cooking time setting guide
4	Price affordability	Conduct price reductions
5	Ease of opening the package	Create a new outlet by providing seating
6	Product Durability	Prepare fresh raw materials
7	Product Variations	Organize frozen variations
8	Inform on the packaging	Provides waterproof labels
9	Ease of making payments	Utilizing social media as an information disseminator
10	Include Expiration Date	

The results of the technical characteristics in the table above were obtained through direct interviews with companies who understand the conditions of the company. So the technical characteristics are suggestions or answers from the company for each attribute of consumer needs.

On the next stage an analysis is carried out regarding the relationship between consumer needs and technical characteristics so that consumer needs can be identified which have a strong, moderate or weak relationship with their technical characteristics. Each relationship has a different symbol, namely a strong relationship is described by the symbol (●) with a value of 9, a moderate relationship is described by the symbol (○) with a value of 3, and a weak relationship is described by the symbol (Δ) with a value of 1. The following is the relationship between consumer needs with its technical characteristics.

Functional Requirements / *Customer Requirements (Explicit and Implicit)*	*Replacing Packaging With Paper/Plastic Materials*	*Make Mold for Several Size*	*Make a Cooking Timing Guide*	*Price Reduction*	*Loading New Outlet*	*Preparing Fresh Materials*	*New Frozen Type Variation*	*Waterproof Label*	*Utilizing Social Media as a Use of Information*
Product Appearance	●	○		▽		▽		▽	
Size Consistency		●	▽				▽		
Price Affordability		▽	●						
Maturity Consistency	▽			●	▽	○			
Ease of Opening the Packaging	●								
Product Durability	▽		○			●			
Product Variations		○					●		
Menu's Information					▽			●	▽
Ease of Doing Payment					○				●
Include Expiry Date								●	

Figure 1. The relationship between consumer needs and technical characteristics

From the results of the matrix relationship images above, it can be seen that each attribute with each technical characteristic has a different relationship and some even have nothing to do with it. This relationship is obtained from the results of expert analysis or the company itself. Column weight is the process of obtaining information and levels in product development. The value of the column weight is obtained by multiplying and adding up the importance rating and the matrix value of the relationship between consumer needs and technical characteristics.

Importance Rating	Maximum Relationship	Customer Requirements (Explicit and Implicit) / Functional Requirements	Replacing Packaging With Paper/Plastic Materi	Make Mold for Several Size	Make a Cooking Timing Guide	Price Reduction	Loading New Outlet	Preparing Fresh Materials	New Frozen Type Variation	Waterproof Label	Utilizing Social Media as a Use of Information
4.72		Product Appearance	42.48	14.2		4.72		4.72		4.72	
4.45		Size Consistency		40.1	4.45				4.45		
4.71		Price Affordability		4.71	42.4						
4.33		Maturity Consistency	4.33			38.97	4.33	12.99			
4.39		Ease of Opening the Packaging	39.51								
4.56		Product Durability	4.56		13.7			41.04			
4.18		Product Variations		12.5					37.62		
4.53		Menu's Information								40.77	4.53
4.6		Ease of Doing Payment					13.8				41.4
4.73		Include Expiry Date								42.57	
Total			**90.88**	**71.5**	**60.5**	**43.69**	**18.13**	**58.75**	**42.07**	**88.06**	**45.93**

Figure 2. Column weights

The column weight value of each technical characteristic helps to show and determine product development priorities to be carried out first. Based on the results above, it can be seen that the first largest weight value that needs to be done first is to replace the packaging with paper or plastic materials. The second biggest weight value that needs to be done is to provide a water-resistant label. And the third largest weight value that needs to be done is to make molds for several sizes.

The correlation matrix is used to show the relationship between technical characteristics using symbols. The symbol (+) indicates a positive correlation while the symbol (-) indicates a negative correlation and the symbol ( ) indicates no correlation at all. The relationship between the technical characteristics is shown as follows. From the picture it can be seen the relationship between the characteristics of the text with one another. Shape as needed relates to or has a positive effect on making cooking guides, reducing prices accordingly, labeling, changing packaging, determining sizes, and holding new variations.

Fig. 3. Correlation matrix

Conclusion

The conclusions obtained in the research on the analysis of quality control for Bakcang Surabaya products are the priority scale that must be improved for business development based on Voice of Customer, namely replacing packaging with materials such as paper or plastic, providing labels for menu information and expiry outside the packaging, making prints for more precise sizes, make cooking time guidelines so that the maturity

level is even, prepare fresh raw materials, take advantage of social media, hold price reductions, make new variations in frozen form, and open new outlets with sufficient facilities.To improve the quality of the Bakcang Surabaya business, what business owners need to do is evaluate the production process on a regular basis by ensuring the eligibility of the product for sale, paying attention to criticism and suggestions from customers both directly and through the mass media, and providing training to employees so they can work to predetermined cooking or production standards

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