

## IMPLEMENTATION OF HIGH VALUE VEGETABLE ECO PACKAGING: CASE STUDY ON LOCAL AGRICULTURAL COMPANY IN YOGYAKARTA

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**Abstract:** A study on the implementation of ecopackaging on high-value vegetables at a local company in Yogyakarta has been carried out. The purpose of this study aims to identify ecopackaging that is preferred by consumers and companies, find out the influencing factors and provide recommendations for making decisions. This research using Quality Function Deployment method approach. QFD translates what the customer wants into what the company produces. The packaging that is liked by consumers and can be provided by companies is the product concept of a box model that can accommodate all vegetable commodities as well as high-value vegetable commodities. Factors in making decisions on implementing ecopackaging in these companies include suitability of form, suitability of materials, price, ease of obtaining materials/availability of raw materials, and packaging design. Recommendations for the implementation of environmentally friendly packaging decision making for high value vegetable products in companies using the QFD method are carried out by involving the active role of consumers, product developers and the company including: managing director, marketing, production team and finance team. Where in this process it is concluded that ecopackaging is recommended to use the form of a cardboard box with paper material for all types of high-value vegetable products. This ecopackaging is intended for PT XYZ B2C consumers with a price priority that is willing to pay IDR 0.- to IDR 5000,-.

**Keywords:** eco packaging, quality function deployment, high value vegetables, green marketing, sustainability

**Abstrak:** Telah dilakukan studi implementasi ecopackaging pada sayuran bernilai tinggi di Perusahaan Lokal di Yogyakarta. Penelitian ini bertujuan untuk mengidentifikasi ecopackaging yang disukai oleh konsumen dan perusahaan, mengetahui faktor-faktor yang berpengaruh dan memberikan rekomendasi pengambilan keputusan. Penelitian ini menggunakan metode Quality Function Deployment (QFD). QFD menerjemahkan apa yang diinginkan oleh pelanggan menjadi apa yang dihasilkan oleh perusahaan. Kemasan yang disukai oleh konsumen dan bisa disediakan oleh perusahaan adalah konsep produk model box yang dapat mawadahi keseluruhan komoditas sayuran sekaligus untuk komoditas sayuran yang bernilai tinggi. Faktor-faktor dalam pengambilan keputusan implementasi ecopackaging di perusahaan tersebut meliputi kesesuaian bentuk, kesesuaian bahan, harga, kemudahan mendapatkan bahan/Ketersediaan bahan baku, dan desain kemasan. Rekomendasi implementasi pengambilan keputusan pengemasan ramah lingkungan pada produk sayuran bernilai tinggi di perusahaan menggunakan metode QFD dilakukan dengan melibatkan peran aktif konsumen, pengembang produk dan pihak perusahaan meliputi: direktur utama, pemasaran, tim produksi dan tim keuangan. Dimana dalam proses ini didapatkan kesimpulan ecopackaging yang direkomendasikan menggunakan bentuk box kardus dengan bahan kertas bagi produk semua jenis sayuran bernilai tinggi. Ecopackaging ini diperuntukkan bagi konsumen B2C PT XYZ dengan prioritas harga yang bersedia dibayarkan Rp 0,- sd Rp 5000,-.

**Kata kunci:** eco packaging, quality function deployment, sayuran bernilai tinggi, green marketing, konsep keberlanjutan

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## INTRODUCTION

One of the main environmental problems faced by society today is waste pollution. Indonesia is the second largest producer of marine plastic waste in the world with 1.29 million tons of waste after China which reached 3.53 million tons (Jambeck 2015). Data showing an increase in plastic products and the resulting impact, the government through Law No. 18 of 2008 concerning waste management in Article 20 explains that waste reduction can be through waste recycling and/or waste reuse. SIPSN data (National Waste Management Information System (SIPSN) 2022 from the Ministry of Environment and Forestry states that there are 18 million tonnes of waste/year and only 51.22% can be handled. The increasing amount of waste has made the government, producers and the public start to consider the need to use products that are environmentally friendly and can be recycled. The government, society and industry are starting to have awareness to implement development that is aware of environmental sustainability. Protection of the environment is an important responsibility that must be implemented by the company. Environmental protection for companies plays a role in enhancing the company's positive image. This is not only an effort to build the company's image but the development of environmentally friendly products is aimed at increasing market share and even increasing consumer loyalty.

Consumers who care and have knowledge about environmental issues generally buy products that are environmentally friendly (Laroche et al. 2001). The high level of concern about environmental damage and consumer awareness of environmentally friendly products encourages consumers to buy environmentally friendly products or green products. Consumers are even willing to pay more to buy environmentally friendly products. This is because consumers think that consuming environmentally friendly products can help reduce environmental damage. At this time companies that implement green products are growing to attract consumer interest in these products. The company's efforts can influence consumers to have awareness and buy environmentally friendly products (Okada et al. 2010). Consumer awareness is not only in the understanding, but also the willingness and ability to buy and even promote environmentally friendly products. Consumer awareness of the use of green products besides influencing purchase intention (Wu and Chen 2014), can also help preserve the environment.

The developing the company's strategy in order to compete in a healthy manner is implementing green packaging, green product, and green advertising. Green Packaging plays an important role of organizations to achieve sustainable economic and environmental performance (Wang et al. 2021). Green packaging is part of the company's efforts to attract consumers through environmentally friendly packaging (Draskovic et al. 2009). Packaging is used as a medium to convey product attributes and brand image (Becker and Van Rompay 2011). Packaging functions as information to increase consumer motivation in buying products, and even packaging is able to provide impressions and information about products that have high quality (Verlegh et al. 2005; Ruwani et al. 2014).

The scope of the packaging field is currently also wider, ranging from a wide variety of materials to increasingly attractive shapes and packaging technologies. The packaging materials used vary from paper, plastic, wood, metal, fiber to laminated materials. In general, the function of packaging is to protect and preserve the product, as a product identity, in this case packaging can be used as a means of communication and information to consumers through labels on the packaging. Packaging can improve efficiency, such as: easy counting, easy shipping and storage (Langley 2021). Because of this efficiency function, packaging has an influence on food loss. The study from the report conducted by (Lockrey et al. 2021) in *The Role of Packaging for Australian Fresh Products* (2018) states that for banana products, the shelf life which is usually 7-8 days has managed to increase by 1-3 days due to packaging. Meanwhile, lettuce using packaging can still be eaten after 28 days, it's different between 4-5 days without using packaging. Eco-friendly packaging is basically easy to recycle, can be composted, and reused. Even so, environmentally friendly materials have the disadvantage of requiring more expensive manufacturing and shipping costs. Along with the development of consumer behavior that is concerned about the environment, companies are encouraged to use environmentally friendly packaging as an attribute in the value proposition of the products they produce. However, it is difficult for companies to apply products with environmentally friendly packaging due to various factors. Today, it is important to reduce and replace plastics in industry and food production. However, the development of new materials for packaging is unsatisfactory because the process is very complex (Tirdasari et al. 2019).

Increasingly high business competition in the realm of post-harvest industry makes companies are competing to determine the right competitive strategy so that they can survive and compete with other competitors. PT XYZ, the post-harvest companies of agricultural products and trying to grow to keep up with the trends current business developments by responding to environmental issues and concepts sustainability green marketing. PT XYZ which have vegetables products want to respond to organic and environmental friendly trends for their products to their consumers. Currently, the packaging used by PT XYZ in packaging vegetables uses almost 95% plastic wrap to maintain the freshness and durability of the vegetables. There are several alternative materials from previous research that will be compared with the company's perspective based on cost benefit parameters for the company, in terms of price, packaging process efficiency, labor expended, shelf life, supply chain (Tirdasari et al. 2019). In addition, in this study, comparisons will also be made in terms of the availability of raw materials for packaging substitutes such as cardboard/paper packs and cloth bags. Of the several packaging alternatives considered, it will also be surveyed which one is preferred by consumers from the company as a consideration from a consumer perspective. Based on this background, the objectives of this research are: (a) Identify packaging is most preferred by consumers and PT XYZ (b) Identify and analyze factors in making decisions on implementing ecopackaging on high-value vegetables. (c) Provide recommendations on how to implement eco-friendly packaging decision-making for high-value vegetables. The expected result of this research is to provide an overview of the implementation of eco-packaging decision-making for high-value vegetable products to become a reference for implementation in post-harvest vegetable companies in Indonesia.

## METHODS

This research conducted from January to March 2023 in PT XYZ. PT. XYZ is a company engaged in the field of post-harvest local agricultural products in Yogyakarta. This study uses data generated from distributing questionnaires from selected consumers and from internal company interviews. In this research,

the data used are primary and secondary data. To obtain primary data, the researchers distributed questionnaires to 70 selected online consumers and interviewed 7 internal management company. The object of this research was carried out on selected online consumers B2C (Business to Customer) and Business Owners, Finance, Production and Marketing Department PT XYZ. The criteria of respondents is customers that buy product around 5-10 times. The sampling process in this study used purposive sampling which is included in nonprobability sampling. the survey methods use online survey and face to face interview for internal management.

The hypothesis in this study is that there is a relationship and meeting point between the consumer's perspective and the company's perspective in determining the ecopackaging of high-value vegetable products. The second hypothesis concerns that there are factors that influence the decision to implement ecopackaging of vegetable products. This is based on previous research (Oktariani et al. 2019) which studied one of the factors for implementing ecopackaging products, there is the availability of ecopackaging materials.

This research uses the Quality Function Deployment (QFD) method. This is a concept to determine ecopackaging design recommendations desired by consumers and capturing company perceptions. It means to translate customer requirements into the exact technical requirements for each stage product development (Sullivan 1986 in Chan Wu 2002). Quoted from Crow (2009), in general QFD consists of four stages are: Product Planning, Assembly/Part Deployment, Process Planning and Process/Quality Control. The Detail Stages of the QFD Analysis Method there are: (a). Identification of Respondent Characteristics (b). Identify Product Attributes (c). Design and Dissemination of Preliminary Questionnaire (d). Selection of Research Attributes (e). Validity Test and Reliability Test (f). Distribution of Research Questionnaires (g). Preparation of House of Quality (HOQ) Matrix (h). Product Concept Design (i). *Screening and Selecting Concept* (j). Selected Product Concept Design Analysis (k). Data collection (l). Data Processing and Analysis. The following is a research framework in Figure 1.

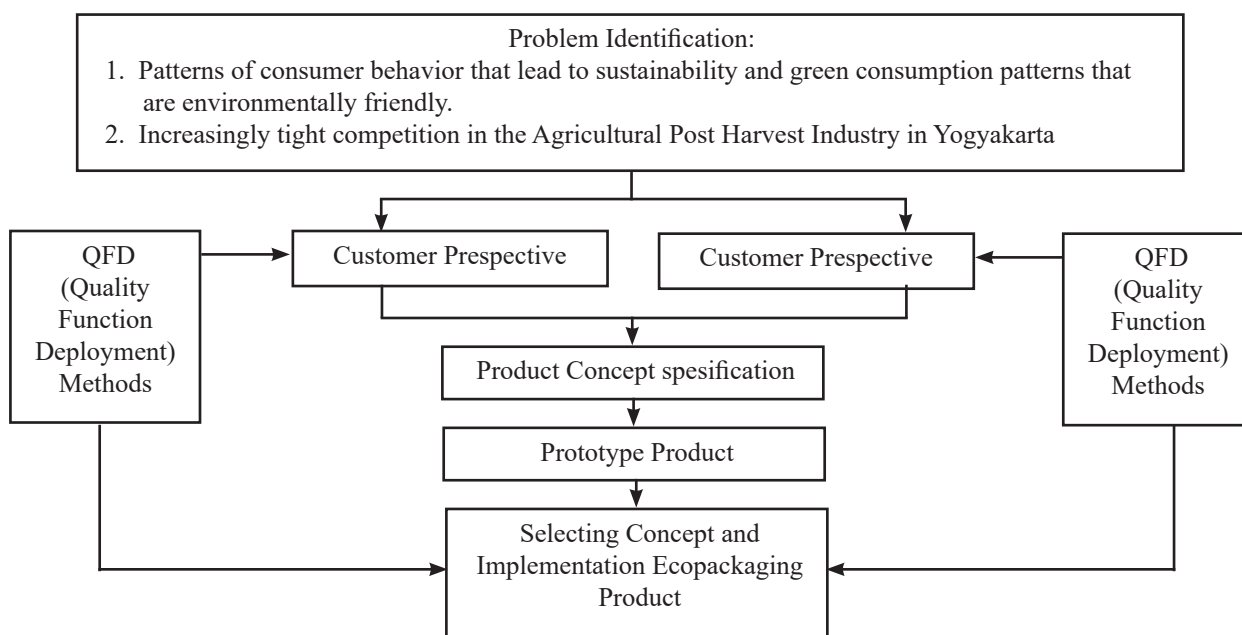


Figure 1. Research framework

## RESULTS

### Identification of Packaging Preferred by Consumers and Packaging That Can Be Provided by PT XYZ

Quality Function Deployment (QFD) is a tool that can be used to assist companies in the production (service) process by translating consumer desires into the technical characteristics of the company. In this research, data collection has been carried out on PT XYZ's B2C consumers. The selected consumers are 98.6% of people who have shopped online at PT XYZ Farm and have purchased PT XYZ's vegetable products. From the data obtained, the respondents had the characteristics of 95.7% female. With an age range of 30-40 years as much as 48.6% and an age range of 21-30 years as much as 39.1%. As many as 90% of respondents have married status with an average job of 44.3% for housewives and 40% for office worker mothers. The average consumer makes transactions with a maximum presentation of 40% less than 5 times. Then followed by consumers with the number of transactions 5-10 times as much as 37.1% and 17.1% consumers with transactions above 15 times. This means that there is a possibility that as many as 17% of the respondents are loyal online consumers of PT XYZ. As many as 30.4% of the respondents stated that PT XYZ had not fully implemented the use of ecopackaging, meaning that there was 30.4% room for improvement for product development towards ecopackaging

according to the needs of consumer interests. From the questionnaire it was also found that 33.3% of respondents recommended packaging materials using leaves, followed by using paper materials 30.4% and cloth materials 29%. The price consumers are willing to pay for this ecopackaging is in the range of Rp0-5,000 - with a percentage of 78.3% of respondents.

In the new ecopackaging design, it is expected that 100% of the respondents want packaging that is environmentally friendly and can be recycled. The recycling process in this questionnaire is explained in more detail that consumers also agree that packaging can be easily disassembled and reused at any time or for other purposes. Some additional features in terms of pershapeance are expected that the new ecopackaging can provide good air circulation. In addition, the new ecopackaging can have sufficient moisture so that it can increase the durability of vegetable products. As we know that vegetables in high humidity will experience a rapid decomposition process whereas when there is no moisture at all it will cause vegetables to lose water content and dry out. From the aesthetic aspect, 53% of respondents stated that they were not interested in attractive color designs, although half of them were quite interested in attractive and not monotonous color designs. As many as 89% of respondents wanted product packaging to be innovated with a more attractive design but still environmentally friendly.

In the questionnaire, the researchers also explored PT XYZ's online consumer understanding of product ecopackaging and evaluated qualitatively the advantages and disadvantages of ecopackaging that PT XYZ had previously implemented. The average respondent understands ecopackaging of products by understanding environmentally friendly packaging, starting from the basic packaging materials to the next process when the packaging is no longer used as its initial function (reusable, recyclable, easy to decompose and not harmful to the environment). When asked about the types of materials that consumers want, they usually mention materials such as paper, cloth and leaves. More specifically they also mention the types of paper packaging such as food paper bags, etc. As for the type of cloth, consumers recommend more towards packaging cloth bags/goodie bags.

Considerations and input from consumers can increase the validity of decisions that may arise in the assessment process for making ecopackaging products. This can be proven by the validity and reliability test values on the importance scale and product ecopackaging satisfaction scale.

On the importance scale, the validity test was obtained only at point 4, namely the perception of environmentally friendly and harmless to the environment, which is close to 0.05. This means that in this statement consumers are still unsure about the perception that it is environmentally friendly and not harmful to the environment. The rest of the other statements are less than 0.05 (close to 0.00), which means the less than  $<0.05$  the statement is more valid. Meanwhile, on the product importance scale, product reliability assessment using the Cronbach alpha technique obtained an alpha value of 0.78, meaning that statements on the scale are reliable (where the reliability requirement is if  $\alpha < 0.7$  then the statement is unreliable, if  $\alpha \geq 0.7$  then the statement is reliable). The validity test of the ecopackaging product satisfaction scale can be seen in table 6. From this table the significance value of each statement is  $<0.05$ , which means that all statements in the satisfaction scale are valid. Reliability test on the satisfaction scale obtained a value of 0.886, the statement is reliable. The value is greater on the scale of importance, indicating that the durability of the previous product is quite satisfactory, but there are

points or parts that need to be re-evaluated regarding the development of the next product, such as the factor of using materials that are more environmentally friendly. After testing the validity and reliability on the scale of interest and product satisfaction. The next step is to describe and classify product attributes. Product attributes refer to eight dimensions of quality (Garvin 1987). From the results of data collection, product attributes can be seen in Table 1.

The next stage, after getting the results from the questionnaire, is to make a house of quality matrix, which requires customer needs data obtained from the questionnaire. The customer's needs data is then used as data for making the planning matrix, the steps for making the planning matrix are importance to the customer by determining the mode of importance from the results of distributing the research questionnaire.

The next stage is to carry out the relationship matrix which is used to determine the relationship by giving a weighting value which will later be carried out by the relationship between consumer needs and technical specifications, then determine the technical correlation where the technical characteristics show the interaction between the technical response and the symbol for the direction of change in technical characteristics, then the interaction between technical characteristics is carried out. to determine the effect on product specifications, and the next stage shows the importance (importance rating) based on determining the priority of the technique or technical matrix which is sorted from the highest value to the lowest value. The main planning tool used in the whole QFD process is the House of Quality (HOQ) (Sara et al. 2019). Quality Function Deployment (QFD) is a systematic approach that determines consumer demands or requests and then translates these demands accurately into technical, manufacturing, and proper production planning. QFD method is used because it can identify the customer's needs and provide the solutions to the existing problems. QFD described by House of Quality contributes to the company about the attributes that need to be prioritized, improved, and meet the customer needs. (Rosnani et al. 2020). The product combination is determined by the development team. The combined results of several concepts can be seen in Table 2.

Table 1. Product attributes

Quality Dimensions	Definition	Product attribute	Explanation
Performance	The core capability of a product in showing its characteristics	- Ability to maintain the quality of vegetables - Ability to minimize impact	The essence of this packaging is the ability to keep the product in the best condition
Feature	Additional attribute that supports its core capabilities	- Good air circulation for vegetables	Good air circulation in to increase the shelf life of vegetables.
Reliability	The possibility of a product being out of service for a certain period of time	- Ability to maintain the quality of vegetables - Ability to minimize impact	Ecopackaging products have a certain amount of time to decompose due to weather and environmental conditions.
Conformance	Performance with predetermined quality standards	- Appropriate shape of packaging - Appropriate packaging materials	The shape and material of the packaging determine the quality of vegetable products
Durability	The period of product use before it is time to replace it	- Product can be reused as a container and recycled - Easy to degradable	Ecopackaging products must have bargaining power where they can Reuse-reduce-recycle
Serviceability	Ease of service or repair when needed	- Ease of getting materials - Availability of raw materials	Ecopackaging products should use materials that have good supply continuously.
Aesthetics	Appearance and attractiveness of products especially in the visual aspect	- Packaging Design - Color	Attractive designs, colors can be monotonous as long as they have an eco- friendly concept
Percieved Quality	Consumer Perception on quality product	- The quality of ecopackaging materials - Price of packaging materials	- The quality determines the ability of the material to protect product - The price determines the quality of materials

The resulting product concept specifications are as follows: **Concept 1:** This concept uses cardboard/boxes made of paper, with a lifting / portable packaging model, insulating adhesive. **Concept 2:** This concept uses the basic ingredients of banana leaves, a tie model with a rope. **Concept 3:** This concept uses paper material, a tie model with a rope inside which contains vegetable seeds. **Concept 4:** This concept uses reusable bag with name brand. The next stage, namely screening and selecting concepts, is carried out by identifying consumer needs involving the company's product development team who understand the making of ecopackaging. Calculations are obtained by comparing each concept with existing eco-packaging products. The final score for the selected screening concept is concept 1. The following results for the selecting concept can be seen in Table 3.

The score calculation is obtained by comparing and calculating the weight of each concept with the existing

ecopackaging product ratings. The final result of the selection concept calculation is concept 1. Packaging uses paper as the main material with additions for simple additional designs and branding (logo). The resulting prototype uses a simple design and can bridge the desires from two perspectives (consumer and company).

### Factors in Making Decisions on Implementing Ecopackaging in High-Value Vegetable Products at PT XYZ

#### Appropriate shape of packaging

The suitability of the shape of packaging greatly influences the process of implementing this shape of packaging including the ability of packaging to provide good air circulation for vegetables, the ability to maintain the quality of vegetables, the ability to minimize collisions, the ability to withstand loads.

Table 2. Concept combination according to technical specifications

Specification Technical	How to Achieve function			
	1	2	3	4
Shape	Cardboard/box	Tie model with a rope (wrapping)	Model Tie with rope (label)	Tote bag model, using cloth
information	These three models were selected based on the shape that consumers expected based on the questionnaire and which could be produced by producers			
Materials	Made from paper	Leaves	Paper	Cloth Bag.
information	The selected material is a quality material of all materials that have ever been used for packaging, this is also in accordance with recommendations from consumers and the company's development/management team			
Price	Small IDR 3,400 Large IDR 4,700	5000/bundle pack	1.350/pcs	Small IDR 3,950 Large IDR 4,950
information	Product prices are obtained from the results of the producer interview process regarding the price needed to produce ecopackaging			
Types of Vegetable	For All types of vegetables, (leaf, root, fruit etc.)	Just in small pack.	Coverage small and large pack size vegetables	All types of vegetables, from small to large
information	Types of vegetable based on the results of producer interviews show that can be ecopackaged are western herbs & hydroponic leaf vegetables (vegetables that are superior and have margins according to PT XYZ).			
The quality of eco-packaging materials	Decomposes in about 2 to 6 weeks.	Decompose in approximately 30 days	Decomposes in approximately 2 to 6 weeks.	Recycled for 5-10 years but can be used repeatedly
information	The quality of ecopackaging materials in fulfilling their function as packaging, for example for branding functions with cardboard/paper and cloth materials will be more durable than recycled paper which has difficulties in terms of production and a faster rate of damage.			
Availability of raw materials	Cardboard Supplier, Always Available	Markets and Gardens, Not always available	Paper and seed label printing (custom based)	Fabric Bag Printing, Always Available
information	The ease of getting goods and the appropriate price is influenced by the number of orders for each item			
Design	Custom Request	No need special design	Need special design	Custom Request
information	The packaging design for models 1 & 4 will be easier to accommodate compared to model 3 with the availability of recycled paper to be used as a label related to how to achieve its function, a special design is needed			

Table 3. Selecting concepts

Assessment criteria	Weight	Models							
		1		2		3		4	
		Rating	Score	Rating	Score	Rating	Score	Rating	Score
Shape of packaging	20%	5	1	2	0.4	4	0.8	5	1
Packaging materials	15%	5	0.75	2	0.3	2	0.3	4	0.6
Price	10%	4	0.4	3	0.3	2	0.2	4	0.4
Types of Vegetables	10%	5	0.5	4	0.3	2	0.2	5	0.5
The quality of materials	15%	4	0.6	3	0.45	2	0.3	3	0.45
Availability of raw materials	10%	4	0.4	4	0.4	2	0.2	4	0.4
Desain	10%	4	0.4	3	0.4	2	0.2	5	0.5
Final score		4.05		2.55		2.2		3.85	
Rating		1		3		4		2	

### Appropriate packaging materials

The suitability of packaging materials determines the quality of eco packaging materials: products can be reused as containers, products can be recycled and easily decompose into other added values.

### Price

The price of packaging is a fairly important factor in implementing ecopackaging. Based on the ecopackaging questionnaire survey from the consumer's perspective, the price range that can be paid is between Rp0 - Rp5,000.

### Types of Vegetables

In this study, the types of high-value vegetables that can support the implementation of ecopackaging are specific leaf vegetables with a relatively high selling price, such as lettuce, kale, kailan, microgreens, and western herbs. The choice of ecopackaging was based on the results of interviews with management and also the selling prices of vegetable products.

### Ease of getting materials/Availability of raw materials

Based on the results of interviews with the production and management, the raw material that management can provide is paper. In this case compared to the new ecopackaging capabilities that consumers want to be able to withstand impacts, have good air circulation and can maintain the quality of vegetables, the concept 1. made of paper/box is the right alternative. These paper boxes can also be easily produced by third parties.

### Packaging Design

The design factor is the last factor that plays a role in determining the decision to implement ecopackaging. This design includes the selection of colors in the packaging.

## **Recommendations on How To Implement Environmentally Friendly Packaging Decision-Making For High-Value Vegetable Products at PT XYZ**

Recommendations in the decision-making implementation process can use the Quality Function Deployment method where screening and selecting

concepts are carried out by identifying consumer needs involving the company's product development team who understand about making eco-packaging for high-value vegetables. Where in this process it was concluded that boxes were prioritized as ecopackaging materials for all vegetable products for PT XYZ's B2C consumers with the first price priority being Rp0 to Rp5,000 - and the second price priority is Rp5,000 to Rp10,000.

Companies respond to differences in the perspectives of consumers and companies by considering and seeing opportunities for improvement (improvement and development) and how companies can continue to adapt to suit the needs and desires of consumers. The existence of insights from consumer behavior patterns towards the market, this is an opportunity for companies to target gaps to enter a good market and maintain it, changing the potential of commodity products sold by companies from intense price competition in vegetable commodities, eliminating competition by providing a unique value proposition on the products sold by the company.

Previous research in Maidin (2021) is also about the redesign process ecopackaging where the prototype uses paper-based materials (paper box) in accordance with the packing material along with other supporting materials. Eco materials which is used can also provide air circulation which can better maintain freshness of vegetables. The design used in this study as well in previous studies using the user survey method, resulting in 4 concepts which is scored or assessed using the Quality Function Deployment. According Indrawan et al. (2019) there are several materials that have been assessed to replace plastic. The results show that material from plant leaves ranks first. Plant leaves is an ideal concept for ecopackaging, they can decompose in short term and ecofriendly. In this paper focus on how the consumer needs as ecopackaging can recycle and reusable and companies can provide. In this case companies needs more branding and advertising using packaging, so the concept 1 & 4 (cardboard and goodiebag) can provide the two perspectives.

### Managerial Implications

Short-term implementation can be according to the QFD method in direct-to-consumer business schemes, where purchases are made on a takeaway basis. The concept of a cardboard box made of paper is suitable as a



container for all types of vegetables and can be recycled and reused as well as a promotional medium for the company's brand where prices are included in the price range that consumers want to wrap. In the long term, if the strategy is applied consistently, this will influence and will become a unique selling proposition for high value vegetable products at PT XYZ as consumers' understanding of the importance of eco packaging and protecting the environment increases.

## CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

Based on QFD method using two approaches from the perspective of consumers and companies the results of packaging is preferred by consumers and can be provided by PT XYZ using product boxes that can accommodate all commodities vegetables as well as for high-value commodities. Factors in making decisions on the implementation include shape suitability, material suitability, price, availability of raw materials, and packaging design. Recommendation strategy implementation using ecopackaging form of a cardboard box with paper material for all types of high-value vegetable products, a price priority that is willing to pay Rp0.- to Rp5,000.

### Recommendations

The advice given in this study is that further research is needed regarding the use of eco packaging on other high-value vegetable types more comprehensively along with quality tests of these vegetables so that they can increase product value as well as further evidence of excellence using ecopackaging. In addition, there needs to be an adjustment to the decision strategy through a direct sales system to consumers or on schemes business to business sales.

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