Design of the Real Time Image Capture Feature for Vegetable Production in Sharia Based E-Commerce

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Abstract. In 2021 the consumer complaint service at the Ministry of Trade in Indonesia recorded those 95.3% or 8,949 consumers made complaints in the e-commerce sector. This condition increased 10 times compared to the previous year. The results of a survey conducted by shopback found that 62.9% of consumers felt that the items purchased did not match the products in the photos. The purpose of this research is to produce an e-commerce application that is equipped with a real time camera feature. The potential for gharar in online buying and selling is quite large. Gharar is a business transaction that contains ambiguity for the parties, both in terms of quantity, physicality, quality, delivery time, even the object of the transaction may still be speculative. Conditions like this are very risky for fraud to occur and there are parties who are harmed, including vegetable e-commerce. To address the needs of users in uncertain times that violate sharia principles, a possible solution is to add a real-time image capture feature of the condition of vegetables which can make buying and selling transactions more transparent and provide benefits for both parties. By using the ESP 32 Cam which sends photos to the e-commerce application server per hour, it is expected that users can see the product to be purchased, both the location and condition of the vegetables. This study uses a literature study method and observations of e-commerce applications that are currently being developed by researchers. The results of this study are in the form of application architecture and real time images successfully sent to e-commerce applications.

Keywords: Sharia Based E-Commerce, Real Time Image Capture, Feature Design

1 Introduction

On the trend online shopping consumers dissatisfaction indicated by several factors, the quality of service provided include lack of security, no physical inspection of the product, lack information, payment systems and visual displays are the main culprits dissatisfaction[1]. In 2021 the consumer complaint service at the Ministry of Trade in Indonesia recorded those 95.3% or 8,949 consumers made complaints in the e-commerce sector. This condition increased 10 times compared to the previous year[2]. The results

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of a survey conducted by shopback found that 62.9% of consumers felt that the items purchased did not match the products in the photos [3]. Product does not match the photo ocuppy in th 5th position on online consumer problems According to Islamic law, if there is an object discrepancy in an online buying and selling transaction, in which there are elements of fraud, betrayal and obscurity of the object or use in the implementation of buying and selling then the buying and selling law which contains these elements is haram [4].

Vegetables have characteristics that easily wither and rot. The vegetable distribution chain starts with farmers, then sellers, then consumers. This distribution chain is the backbone of Indonesia's food security, so it is important for this chain to run smoothly [5]. Vegetables as nutritional supplements must reach the community with good quality. Consumers tend to like fresh vegetable products, by therefore vegetables should be immediately distributed to consumers minimize downturns quality. Modern lifestyle changes what's happening right now, too effect on vegetable purchases fresh. Sunaryanto argue that one key success to achieve satisfaction consumer is to apply the principle of 2Q + 2C that is Quality, Quantity, Continuity, and Conformity. Consumers who previously bought fresh vegetables in traditional market began to switch to the market modern (online market) with various consideration [6]. According to Justuno [7] that 93% of consumers consider visual content to be the key deciding factor in a purchasing decision. Therefore, sellers and e-commerce vegetables product companies need to have a mock-up website with a view that can be enlarged in the photo area, can be seen from various angles, visible texture, so that consumers can realistically describe the product. Then, the seller needs to implement quality control of the products, before delivered to the customer. Perceived service can be improved by providing detailed information on product availability and seller competency. Then, sellers can implement service excellent (employees/sellers are more helpful and have product knowledge, easy to find product information) and the implementation of customer service that can communicate well, so, as to facilitate consumers in purchasing products and submitting complaints. Facilitate access for consumers in term of complaints directly to the seller with good procedure and system that can motivate consumers to convey dissatisfaction that occurs.

The rooftop garden is a brand of fresh vegetables cultivated using the hydroponic planting method which is located at the green house on the rooftop Universitas Muhammadiyah Bandung building. Modern lifestyle changes what's happening right now, too effect on vegetable purchases fresh. Consumers tend to like fresh vegetable products, by therefore vegetables should be immediately distributed to consumers minimize downturns quality. Consumers who previously bought fresh vegetables in traditional market began to switch to the market modern (online market) with various consideration. Consumers need a real time image to ensure the condition of vegetables rooftop garden ecommerce that add a real-time image capture feature of the condition of vegetables which can make buying and selling transactions more transparent and provide benefits for both parties.

2 Method

The research methodology used by the authors in the design of this application includes data collection, system analysis, and design the system. Data collection activities were carried out by interviews, observation and literature studies. Interviews are addressed to consumers to obtain information about system requirements and determine the goals to be achieved from the system to be built. Furthermore, the authors make observations on various other online sales application sites so as to be able to provide references and a clear picture of the structure of the system to be created. In addition, literature studies come from various articles, books and scientific papers as the author's basis for developing mobile-based applications. After the three processes are completed, the researcher will analyze and design the system.

3 Result and Discussion

Based on research by Sakoikoi & Priyanto [8], consumers are satisfied shopping for vegetables online due to several factors, namely product appearance, product quality, website quality, information content, diversity and ease of transactions. Google Trends Indonesia data shows that searches for fresh produce on the internet with the keyword "vegetables online" increased significantly in March 2020 [9]. Similar to what was revealed by Chang & Meyerhoefer [10] that during the pandemic that hit Taiwan, the demand for grain, fresh fruit and vegetables, and frozen food increased the most, which benefited the agribusiness sector. Various online sales applications play a role in facilitating consumer access in meeting fresh product needs while adhering to health protocols. In Indonesia, several e-commerce sites, such as Happy Fresh, Sayurbox, Tanihub, Brambang, TukangSayur.com, Cari Sayur, Fresh Box, Kecipir, etanee, kedai sayur and others, provide buying and selling services for fruit and vegetables, which during the Covid-19 pandemic the volume of sales of vegetables and fruit was through their platform is increasing [11]. Vegetable quality and transaction security when buying vegetables online are also considered important attributes and affect the customer satisfaction index [12].

To run e-commerce properly, it takes a basic process that is needed, which is called the e-commerce process architecture which includes [13], access control and security, for example building e-commerce sites for customers to say who they are through names and passwords, encryption keys, or certificates and digital signatures, while e-commerce sites must authorize access only to sites that are necessary for each user to access to carry out their transactions. Besides that, profiling and personalizing, search management, content management, catalog management, workflow management, event notification, collaboration and trading, and payment process are also required.

In the midst of advances in information technology and digital literacy in society, e-commerce has become an option for people to make transactions to buy the products they need. As well as being a medium for marketing their products on the provided e-commerce platform. Of course, this opportunity can be exploited by synergizing and collaborating in the development of Islamic economics and finance. Thus the presence

of sharia e-commerce will accelerate the formation of a digital sharia economic ecosystem. To realize the existence of sharia e-commerce, all sharia economic actors can sit together to formulate a platform that is able to have a shared vision and provide business benefits. This condition is a very open opportunity in developing the Islamic economy broadly and at the same time accelerating the integration of the Islamic economy. Apart from that, sharia e-commerce will also encourage attraction for millennials to know more deeply about the economy and sharia financial products.

In the perspective of Islamic economics, E-commerce as a digital economic trend is something new and contemporary. Basically, Islam is a religion that makes it easy for its people to carry out buying and selling transactions, it's just that there are several sharia provisions that need to be fulfilled. Islam prohibits buying and selling transactions that contain elements of usury, gharar, fraud, gambling (maisir), and haram which can cause harm to one of the parties. In the Islamic concept, all interactions between humans (muamalah) are basically permissible, as long as there is no argument stating its prohibition, as stated in the following legal rules "The original law in the field of muamalah is permissible until there is an argument that forbids it". From Abdullah bin Mas'ud RA., he said: "Rasulullah Saw. said: "It is obligatory for you to be honest, because in fact being honest shows (the culprit) to goodness, and kindness points to Heaven (HR. Muslim). Carrying out muamalah activities through e-commerce, the content/information that is shared must be correct, both in terms of content, source, time and place, background and context of the information conveyed. In other words, there should be no element of gharar in selling goods online. In other words, the product being sold must be clear, both in terms of its physical appearance, its use, and the information conveyed (no elements of fraud). It is therefore essential that e-commerce systems must be in conformity with the Islamic law of contract which requires that it must be devoid of fundamentally prohibited elements of riba (usury), gharar (uncertainty), haram (forbidden) objects and maysir gambling) to be deemed permissible to Muslims [14].

Thus, the presence of E-commerce is expected to be able to provide convenience for every economic actor, while still adhering to the specified muamalah corridor, so that buying and selling is carried out free from elements of maysir, gharar, haram and usury. In addition, it is hoped that the development of E-commerce can be utilized by Muslims so that it can support the development of the Islamic economy, especially in the development of the halal industry in Indonesia. Requirements for sharia compliance e-commerce transaction is shown in Table 1.

In addition to observation and literature study, data collection was carried out by interviews. User Story is used to explain the tasks and purpose of using the application from the user's side (Table 2). This is very important because the list of user stories will be used for the next system development process. The following is a list of customer user stories collected based on the results of interviews with 30 consumers.

The e-commerce system that has developed, named rootopgarden, is designed to help overcome market uncertainty or problems with variations in the availability of unstable vegetable stocks. This system application is designed by focusing on the point of view of vegetable customers. Customers, sellers as well as farmers in the case of hydroponic green house managers at the University of Muhammadiyah Bandung can

all communicate with each other. There are 8 functional requirements for the rooftop garden system that will be developed. These needs are formed to become features that as a whole will help with the problem of fulfilling vegetable stocks. The functional requirements for the rooftop garden e-commerce are listed in Table 3.

Table 1. Requirements for sharia compliance e-commerce transaction [14]

	Form	**Offer Acceptance**
Islamic Law of Contract (Compliance)	Contracting parties	Buyer Seller
	Subject matter	Object Price
Devoid of Riba (Usury)	Riba medium of payment (Mainly riba credit card) Riba al-Buyu (Items such as gold, silver & other usurious items)	
Devoid of Gharar (Uncertainty)	Uncertainty over product or service Uncertainty over price and payment Uncertainty over delivery and deferment	
Devoid of Haram (Forbidden) Products & Services	Sharia prohibited goods or services	
Devoid of Maysir (Gambling)	Acquisition of wealth by chance	

Table 2. User story based on interview result

As ...	**I want ...**	**So ...**
User/ Customer	Edit profiles	Accounts that have been registered can be customized with personal data
	Changing the password	Account security can be guaranteed and maintained regularly
	Entering the product I selected into the shopping cart	Can select more than one type of product at a time before ordering a product
	Canceling an ongoing transaction	The order process is discontinued when something goes wrong
	View harvest schedule	Can plan when purchase will be made
	See photos of vegetables in real time	Can see the real condition of vegetables

Table 3. The functional requirements

Code	**Functionality**
U1	Buy
U2	Stock
U3	Accept Purchase
U4	Estimating
U5	Courier
U6	See the harvest schedule
U7	See the real time image
U8	Chat

The author determines the priority functions in the following order: purchasing function, stock function, receiving purchase function, and estimating function. These functions have the highest priority because they interact directly with vegetable customers. Other materials used are development board micro-USB to TTLCH340, microSD, adaptor, 3D print custom case. The number of cameras needed is 12 close-up cameras portable, 1 camera for seedling block, 3 wide camera, 1 camera in the stock room/ cooler.

At each point, the camera module is mounted on a 3-foot stand and is complemented by a gimbal for angle-of-view adjustment. The ESP32 Cam is a small-sized, low-power camera module based on the ESP32. The ESP32 Cam is quite small (27mm x 40.5mm x 4.5mm) and weighs 10g so it doesn't require a large space. ESP32 Cam is suitable for wireless monitoring, because it uses little power and has WiFi and Bluetooth connections. In this case we are using a 2.4 GHz WiFi connection as the ESP32 Cam communication medium to the Webserver. The ESP32 Cam uses a 5V DC power source to operate. The ESP32 Cam uses the OV2640 camera. The OV2460 has a CMOS sensor that has a resolution of 2 MegaPixels (1632px x 1232px) and a lens with a Field of View of 65°. Also equipped with onboard LEDs for flash and multiple GPIOs for connecting peripherals. The camera device is shown in the Fig. 1.

Fig. 1. The camera used for real time image

The process of sending images can be described as follows, ESP32 takes a photo every set time range then it sends http requests to server via wifi. After that, upload.php receive photo from ESP32 cam rename photo file with time and save it in upload folder. Finally, photos are processed by a web server to be displayed on marketplace. Image capture is done automatically using programming (with arduino IDE) that is uploaded to the ESP32 cam that can set according to our needs, for example every 30 seconds. ESP32 Cam sends image via http protocol to the domain address, then the web server captures the image sent to be stored in a folder on the webserver. The PHP script is responsible for receiving incoming image from the ESP32 Cam.

The rooftopgarden application is designed to be built as software that runs on mobile hardware, shown in Fig. 2. The development of the E-Vegetable application interface prototype was carried out using the Figma design service. Using Figma allows a group to collaborate on a design model remotely.

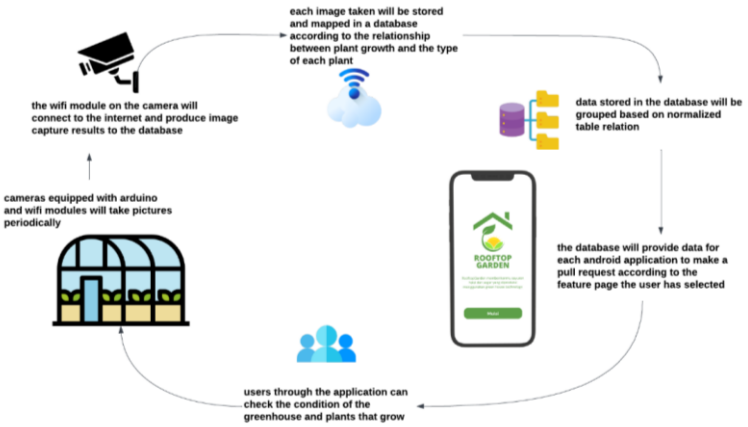

Fig. 2. System Design

The rooftop garden app can be downloaded in rooftop garden landing page (Fig. 3). The rooftopgarden start page will be encountered by users when opening the application. On this page there is a login button to then go to the login page which when pressed will forward the user to another page.

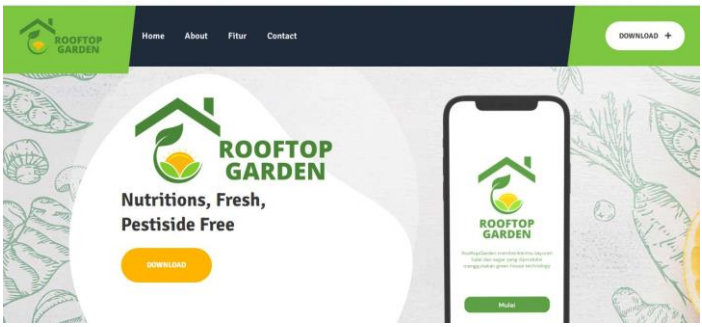

Fig. 3. Rooftop garden landing page

The menu “buy vegetables” page and “harvest schedules” (as shown in Fig. 4) can be found by customers users from the main page. This page will be visited the most because it is used to initiate transactions to buy vegetables. Customers also can see a list of some of the vegetables available. When a customer chooses a vegetable, a price, product details and vegetable availability will be displayed.

Fig. 4. Main menu and harvest schedule display

After selecting vegetables, several forms will be displayed to the user as shown in Fig. 5. Fill in this form regarding the purchase amount, order from the seller along with delivery time, and delivery method. If customer wants to buy vegetables in the future, the transaction will be in the form of an order with a delivery time that the customer can specify. Then there is a button that will enter the order into the customer's shopping cart.

Fig. 5. Check out display

Users can also make purchases by doing price comparisons first. From the main page, customer can enter the "Browse vegetables" page. With this feature, customers can buy vegetables with greater confidence because they already know the condition of the vegetables in the garden by looking at some real time images. By using the ESP 32 Cam which sends photos to the e-commerce application server per hour, it is expected that users can see the product to be purchased, both the location and condition of the vegetables. The photo was successfully sent and appears on the e-commerce application as shown in Fig. 6.

Fig. 6. Real time photo gallery

After the user completes the payment, the transaction will be forwarded to the seller's entry transaction list. With a page "see the harvest schedule" and “wish list”, the seller can find out when the vegetables he will need to be provided to the customers for one day. This application is also equipped with the chat feature.

4 Conclusion

Rooftop garden e-commerce application and a real-time image capture delivery system have been design. Realtime image delivery to the rooftogarden.id server was successfully carried out. There are eight parts of the system interface each created to facilitate one or more functional requirements.

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