Bid-Fish: An android application for online fish auction based on case study from Muara Angke, Indonesia

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Bid-Fish: An android application for online fish auction based on case study from Muara Angke, Indonesia

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Abstract. In utilizing natural resources from the sea, the Indonesian government has obliged fishermen to distribute all the fish they catch at a fish auction institution that has been provided at each landing port, namely the Fish Auction Place or known as *Tempat Pelelangan Ikan* (TPI) in Bahasa. In this study, we made a sample case at the TPI Muara Angke, North Jakarta which has a function to improve the welfare of fishermen through an auction which is expected to achieve optimal prices. However, in practice, it turns out that there are often price discrepancies expected by fishermen because there are no bidders who bid for more of the fish they have made fishermen prefer to sell their fish catches into cold storage or even directly abroad due to a bad auction system. This is very detrimental to Indonesia because it has lost a lot of its national income. Therefore, it is necessary to digitize the embodied fish auction process in the form of an online mobile platform-based fish auction application to be able to introduce fish training more widely so that many auction participants want to bid higher fish auction prices without limited space and time for bidders participate in the auction so that the potential value obtained by fishermen can be greater and in accordance with the expectations of the fishermen. In this study, we built a mobile application for online fish auctions called "BidFish" which consists of two applications for admin (TPI) and users who have the auction feature (auction) in real time within the time specified by the admin who will automatically determines compiling a price quote from the highest price other than that there is a deposit storage feature (BidPay) which is a requirement for the user to be able to attend an auction. This application is built with the Android platform considering the level of Android smartphone usage is very large in Indonesia so it is expected to be a solution to the price mismatch problem that occurs in an auction by getting more bidders.

1. Preliminary

Indonesia is an archipelago consisting of more than 70% water area on its surrounding. This is certainly an opportunity for Indonesia to be able to optimize all natural resources obtained from its water area. However, in Indonesia is still lacking on facilitate the implementation collateral duty lives of fishermen catch fish in the sea, so many fishermen prefer to sell their catch to distribute abroad compared directly into the State. As stated in the Regulation of the Governor of DKI Jakarta No. 44 of 2015 section 9 section 5m [1] which confirms that the Executing Unit of port Fisheries has the job of one of them is implementing the auction then made a fish auction place (TPI) which has a function to improve the welfare of fishermen [2] via auction are expected to achieve the optimal value for the

income of fishermen are still at values less effective, because often times the price that they got by fishermen fishing does not match expectations. One of the factors that influence this problem is the limited public access to the location of fish auctions (TPI) and the limitations of the segment of buyers who only come from local residents so that they cannot bid at a higher price.

Reporting from the site Emarketer.com a digital marketing research institute stated that by 2018 Indonesia will surpass 100 million active smartphone users that will make Indonesia as the fourth biggest smartphone user population in the world [3]. This opportunity, certainly can be used by Indonesia to overcome the above problems by to digitizing the fish auction process through an application platform mobile like Android to introduce the fish auction, more broadly in order to include more people who follow the auction that will be competition auction prices tight and produce a high-end price auction without being confined by limited scope and time.

2. Research Methods

The method used to build applications for online fish auction is Agile Software Development [4]. It is an approach to project development that covers the scope, design, build, test, check and deploy a project within the time span between 4 to 6 weeks of development projects that enable a redesign based on advice or criticism from the evaluation of the use of the system by the user [5].

There are a number of specific methods in agile model, in this research, we used an Extreme Programming (XP) that is a type of software development intended to improve quality and responsiveness to evolving customer requirements with assuming simplicity principle in XP [6].

Tempat Pelelangan Ikan (TPI) Muara Angke is a fish auction place in Jakarta which in this case becomes a BidFish customer that we make as a reference source for building the BidFish application. Our study lasted for 3 months until it reached the current application.

The Agile Software Development Model can be visualized as below :

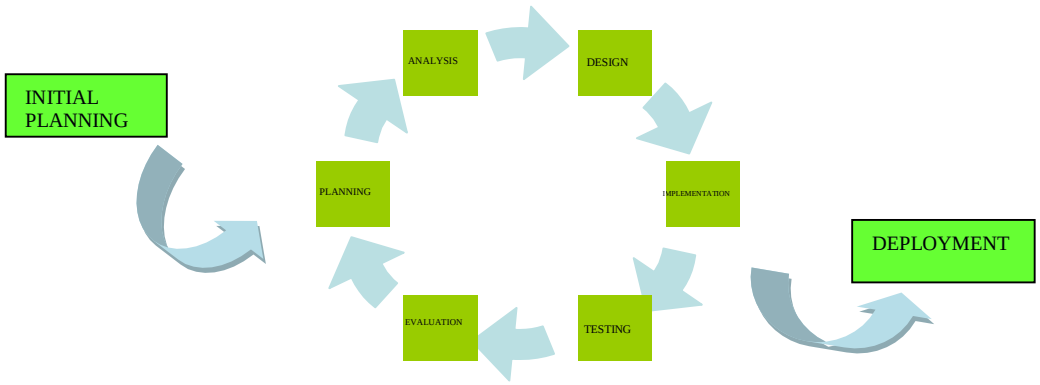

Figure 1. Agile Software Development Model

2. 1. Initial planning

At this initial stage, we determine a the scope of the project, including the method being used and the cooperation with TPI Muara Angke. A period (*sprint*) were determined in order to complete the development of all modules effectively.

2. 2. Planning

The planning stage of the development of system modules, including:

- Defining user needs and requirements.
- Determination of processing time
- The division of tasks for programmers
- Budgeting

2. 3. Analysis

This stage aims to analyze the current system and the new system to get the right system improvements:

- The current system of business process analysis
- A new system of business process analysis
- Analysis of the needs of the system module

2. 4. Design

After analyzing the course of the system, then the next stage is Design stage which aims to design the modules specified in the first sprint using the User-Centered Design (UCD). The output of this stage is the prototype of the modules.

2. 5. Implementation

This stage is the construction step done by the programmer to integrate all the modules in accordance with the design that has been created in, implemented inside the application system.

2. 6. Deployment

After making the application of the direct application deployed as version 0.0 with limited functionality only covered the modules with highest priority.

2. 7. Testing

Stage for testing the system in order to know the extent to which applications run as user desired performance and know the point of the problem (error and bugs) that exist in the application.

2. 8. Evaluation

This stage aims to present the recording or documentation of system testing that has been done on the subject evaluation in order to achieve system improvement by enhancing the iteration on further system development.

3. Result And Discussion

3. 1. Initial Planning

TPI Muara Angke organize a conventional auction, in which we had found some potential problem through this conventional system experience. Fishermen should participate in every auction held, but so many fishermen who still refuse participating or become an auctioneer and choose to sell the fish catch result to the *cold storage* or exporting the resource abroad, because of the small interest of participant or bidder. This cause some contradictory to the Regulation of Governor. By auctioning the fish, Indonesian market price stability can be maintained properly [7].

Figure 2. Bidders see fish that will be auctioned

Figure 3. The fish will be auctioned

3. 2. Problem Analysis

Several activities including field observations and interviews had been conducted during this study at TPI Muara Angke to deeply analyze the problem. The analysis involved several stakeholders that are higly relaed to the fish auction process at TPI Muara Angke. Problems that occur within the current auction system which can be identified at this time are:

- Fishermen who still refuse auctioneer fish and choose to sell fish catching result of cold storage, as opposed to government regulation of 2002, the government provides guidance and support in order to capture the results of the fishermen sold through auctions.
- Many people who are not familiar with the fish auction, given that the fish auction place a limited presence.
- The auction is held every morning, and have a relatively complicated process carried out by the roles involved in the auction. Then the auction process can be made more effective and efficient than the conventional auction system.

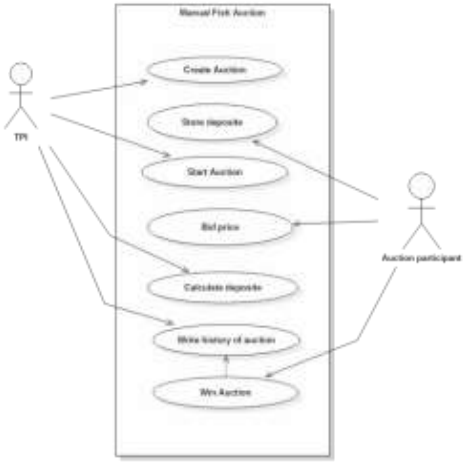

Figure 4. Use Case Conventional Fish Auction

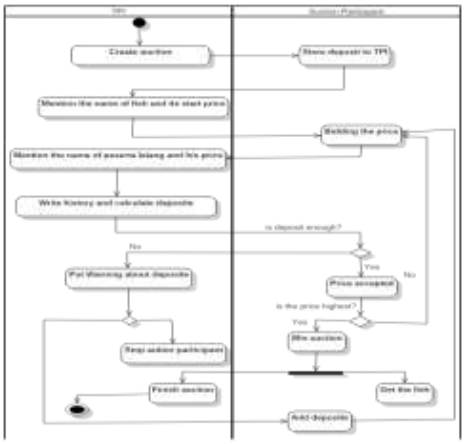

Figure 5. Activity Diagram Fish Auction Conventional

3. 3. System planning

From the analysis of the problems that have been described, we generate several requirements related to online fish auction application design that are described as follows:

Table 1. Actor details

Actor	Description
User (Customer/Auction Participant)	User is someone who would be Customer or Auction Participant. Auction Participant can do bidding on any auction wants, by accordance with existing regulations.
Administrator (TPI/ Auctioneer)	Administrator is someone who takes duty as Auctioneer in this system, with this case, Tempat Pelelangan Ikan Muara Angke (Fish Auction Muara Angke). Auctioneer's responsibility is to held the auction, takes full control of the auction, in accordance with existing regulations.

3.3.1. Design Solutions Digitization strategy in online fish auction system can be implemented in an application android based online fish auction, which is expected to facilitate the work of the auctioneer within streamline time in auction activity, and customers get access to better communication and wide without having to come to the venue. The auction will be run in real-time. The online fish auction application consists of two applications, namely the application for an *auctioneer* and *customers*. Thus, the application can introduce the fish auction to the general public, so that the participants of the auction and the fishermen's income will be increased. Moreover, fishermen will not have to sell the fish catch to *cold storage*.

3.3.2. Target Users and Markets This application is used by the fish auction place and also customers—people who want to buy fish through fish auction (the actor has been described on Table 1). Fish Auction Place will make the auction in accordance with the existing Standard Operating Procedures. Figure 6 and 7 show the proposed solution of online fish auction application.

Figure 6. Use case conventional fish auction

Figure 7. Activity Diagram Conventional Fish Auction

3. 4. Applications Features

The main features are the features BidFish applications in real time auction to determine the highest price offered by the customer, the deposit feature, feature an auction participant registration and proof print features the winning bidder.

3. 4. 1. Feature 1: Fish Auction Features fish auction is for the fish auction features real time in the application. Fish Auction Sites Indonesia as the auctioneer will make a fish auction within the specified time passes auctioneer special applications, which will be directly integrated with customer specific applications. Customer-specific application will show you the data that is being held auctions, and will immediately be able to follow the auction. Customers can make an offer / quote in real time, and the system will automatically determine the winner based on the highest bid during the auction period ends. If both bidders to be a winner in the fish auction, the auction participants will print a proof in the form of receipts / receipt of electronic pdf file format.

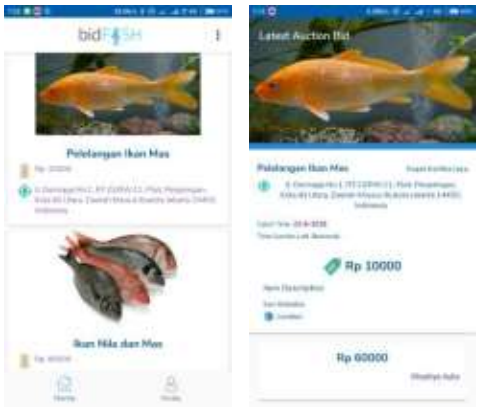

Figure 8. Features Fish Auction Online (Customer)

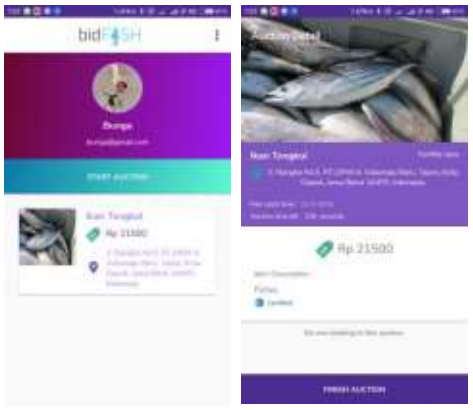

Figure 9. Features of Fish Auction Online (Auctioneer)

3. 4. 2. Feature 2: BidPay BidPay features are the features of the participants deposit the auction before it enters the auction. Deposit is one of the requirements of customers can be a bidder. Features BidPay is where the auction participants to save a deposit to participate in the auction.

Figure 10. Bidders profile

Figure 11. Feature: BidPay

4. Conclusion

Indonesia needs to introduce their fish auction more broadly to encompass a lot of people that would occur auction tight price competition and result in higher final price auction. Therefore, they invented the fish auction online application called BidFish.

BidFish expected to be a platform that is able to facilitate the work of the auctioneer in time streamline the auction activities, customers get access to better communication and wide without having to come to the venue. Of course, the auction will be run in real-time. In addition, the online fish auction application can introduce the fish auction to the general public, so that the participants of the auction will be increased, so that the fishermen's income will be increased, so that the fishermen do not have to sell the fish catch to cold storage.

BidFish consists of two main applications, namely application for the *auctioneer* and the *customer*, where the auctioneer is an opportunity for TPI to hold online fish auctions, and the customer application is where the bidders can follow the online auction, which was held by TPI.

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