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Nitipyuk: A Crowdsourcing Marketplace for Personal Shopper

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Abstract

Over the past two years, personal shopper businesses have been increasingly carried out individually through social media. Several web applications offering this type of services have emerged, but they did not come without limitations to certain products and feature availabilities in them. The limitations to individual personal shoppers were raised as the problems that will be discussed in this study. The purpose of this research was to develop an application that can open an opportunity for anyone to become an entrepreneur as well as requester or personal shopper customer. This research involved literature review, comparative analysis of similar applications, application design and evaluation with proportion testing to compare the proportion of users who agreed to those who disagreed with the statements related to the variables evaluated. In addition, an independent test was also performed to find out about the variables related to users' satisfaction with the application. The researchers suggest developing an e-commerce application with an addition of a bidding feature to increase the level of requester-traveler interaction. From the evaluation results, it can be proven that Nitipyuk is useful and easy to use for users. It only needs improvement in the user interface design to better attract users.

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Keywords: Marketplace; E-Commerce; Crowdsourcing; Personal Shopper; Web Application;

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1. Introduction

Personal shopper business has been striving in Indonesia over this past two years[1]. To start this business, it does not require a huge amount of fund. Generally, this business is carried out through individual promotions via social media. Consequently, people interested in this type of businesses (usually souvenir enthusiasts or travelers) gain only a limited amount of information through social media and conduct their transactions based solely on trust. Although several web applications are available to offer this type of services, limitations to certain products and feature availabilities are still present in those applications. This is based on a comparative analysis of similar applications conducted by the authors.

A research team from Stanford University had developed a prototype crowdsourcing marketplace that gives an opportunity to anyone to increase their potential by utilizing their expertise called Daemo[2]. Crowdsourcing marketplace has applications in various fields. For example, some projects in Europe have been carried out using this system. A project can be completed by digital workers who live in different places by collaborating together on the project[3]. An increase can be found in the number of companies that switched from closed business systems into open business systems through crowdsourcing, one of which is Threadless[4]. Both the for-profit and non-profit sectors applied crowdsourcing systems to gather funds in the form of either cash or goods (untukmu.com). Afuah and Tucci proposed these systems as a more efficient and effective alternative solution to solve a company's problems that cannot be solved internally[5].

Baethge et al.[6] in a social commerce study state that it is necessary to consider and attempt to meet the requirements of a diverse group of users during the development of a website. They also suggest that it is important to develop a website that can bring together varying users like personal shoppers and customers.

The ample opportunity for personal shopper businesses and the limitations to individual personal shoppers are raised as the problems to be discussed in this study. The purpose of this research was to develop an application that allows plenty of opportunity for anyone to develop a personal shopper business through an e-commerce-based crowdsourcing marketplace with an addition of a bidding feature for negotiating the price before a transaction takes place. To find out whether the suggested application has fulfilled users' requirements, the researchers used a statistical test in which feedback from users after trying this application was evaluated. The statistical method used was the proportion test. There were seven variables evaluated by looking at the proportion of users who agreed to those who disagreed with the statements related to the variables evaluated. In addition, an independent test was also conducted to find out which variables were related to users' satisfaction with the application.

2. Literature review

According to Dan[7], unique features are present in e-commerce technologies accessible at anytime and anywhere (ubiquitous), reaching not only local but also global markets. They also have operational standards well-known in general, rich with contents from the products sold or the services offered. There is also an unlimited amount of invaluable information available through the features that allows interaction between customer and merchant. Personalization and features that allow users to submit and share products, information, or photos are also readily available.

Crowdsourcing is defined as the application of information technologies as resources, both labor and non-labor, from various open calls[8]. The literature study by Palocious et al. resulted in a conclusion that the application of crowdsourcing includes five main components, namely work as a problem solving solution, produce idea and learning media related to the gathered knowledge shared by multiple sources, a collaboration program that should be able to develop new innovative programs based on the knowledge spread in the crowdsourcing, a method of new product development with facilitation for customers' participation in contributing ideas for the new product, and crowdsourcing's ability to build a relationship between start-up companies and entrepreneurs[9].

Siyal and Xavier developed a model to perform crowdsourcing-assisted software engineering. This model is used to complete a software project by employing online workers to work on various portions, such as user requirement extraction, design, coding, and testing[10]. CrowdCE is a model for Software Development Life Cycle (SDLC) in which the development step is performed by crowdsourcing software. The result of this evaluation model is better than the traditional SDLC[11].

Some other research studies related to crowdsourcing include one regarding the development of Champagne, a web tool used to start a campaign through crowdsourcing[12], one regarding a crowdsourcing-based auction system[13], and a literature study related to fund gathering through a crowd, or better known as crowdfunding[14].

Limitations to employee recruitment now can be overcome with the advent of CrowdAdvisor, a marketplace that gives an opportunity for users to apply for jobs by applying crowdsourcing. CrowdAdvisor provides an online assessment that helps a company to decide whether a potential employee would be a good fit or not for them[18].

The concept of crowdsourcing is applicable not only to business-natured e-commerce marketplace activities but also social activities, in which it helps social organizations to obtain required items through crowddonate. This has been applied in the web application Untukmu.com[19].

3. Methodology Research

a. User Requirement Survey
   A survey was conducted on 132 respondents, consisting of students, employees, housewives, and entrepreneurs. The data gathered were related to their experience in online transactions or in using personal shopper services as well as the obstacles they faced when conducting personal shopper services transactions.
b. Comparative Analysis of Similar Applications
   Based on the data gathered through the survey, a comparative analysis of similar applications was conducted to find out the existing advantages and disadvantages. The applications analyzed were bistip.com and airfrov.com.
c. Crowdsourcing Marketplace Model Design
   The roles proposed in the model consist of three components[15]: a client role, consisting of people who request the product, also referred to as requester; a vendor role, consisting of travelers who buy the product requested by the client; and a crowdsourcing marketplace role, that makes sure both client and vendor roles perform their respective tasks.

Among the e-commerce features defined by Dan[7], applied in the design of the web-based application Nitipyuk, which is applicable anywhere, there is a bidding feature that facilitates the interaction between client and vendor in not only local but also global market. The design of Nitipyuk system can be seen in the following diagram (Fig.1) :

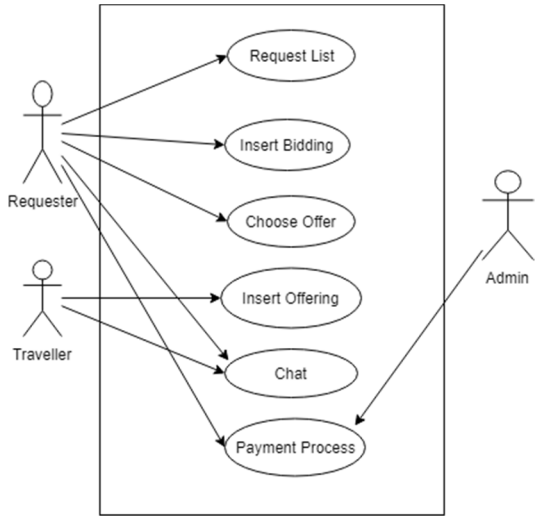


Fig. 1. Use Case Diagram for Nitipyuk App

In Fig.1, Nitipyuk has a functionality to request for a list of items, insert price bidding of the desired item, choose an offer to purchase from the many available offers, and make a payment.

d. Application Evaluation

Evaluation was carried out on Nitipyuk in order to obtain feedback on the application usability. There were seven variables used:

1. interesting application display;
2. ease of use of the application;
3. facilitation for the process of personal shopper transaction;
4. benefit obtained from the application;
5. ease of use of the features in the application;
6. users' satisfaction with the features in the application; and
7. worthiness of the application to be widely spread.

The seven variables above were used in the evaluation involving 19 respondents who had tried Nitipyuk. They would either agree or disagree with the statements related to the seven variables. The proportion of those who agreed to those who disagreed with the statements was computed. If the proportion of those who agreed with the statements was higher than 0.5, the evaluation result would be considered positive. However, if the value was less than 0.5, it would be necessary to make corrections and improvements in the application. The proportion test started from defining the hypothesis, to performing statistical calculation, to determining the rejection area (16).

H_0: $P \leq 0.5$ (there are no proportion differences).

H_1: $P > 0.5$ (there are proportion differences).

$$Z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1 - p_0)}{n}}} \quad (1)$$

The value of Z, as shown above (1), is a statistical test value. That value was to be compared with the value of table Z_α. H_0 was to be rejected if $Z > Z_\alpha$ or if the p-value was smaller than α. If H_0 was rejected, the results of the evaluation of Nitipyuk would be based on the good results of the variables evaluated.

e. Analysis of Factors Related to User Satisfaction

One of the variables evaluated was users' satisfaction with the features in the application. If users were satisfied with the application, an analysis of factors that caused user satisfaction would be done. To evaluate the relationship between two variables, a statistical independent test was performed. The evaluation was conducted by testing the relationship between the variable user satisfaction and the other variables (application display, ease of use of the application, facilitation for the transaction process, user benefit, ease of use of the features, and worth of being spread widely). If there was a relationship between the variable user satisfaction and the other variables, attention would need to be directed to those variables to increase users' satisfaction with the application. The independent testing started from describing the hypothesis, to calculating the chi-square statistics, to finding out the rejection area (17).

H_0: There are no relationship between two variables.

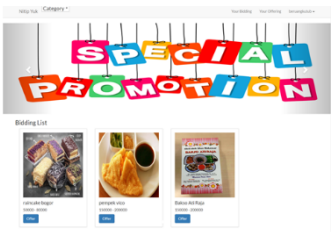
H_1: There is a relationship between two variables.

$$\chi^2 = \sum_i \sum_j \frac{(f_{ij} - e_{ij})^2}{e_{ij}} \quad (2)$$

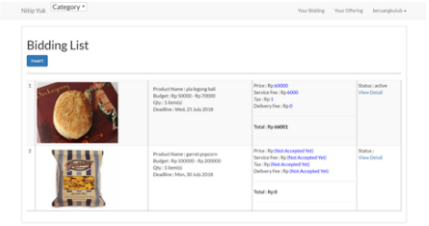
where f_{ij} is the frequency of the observation from the contingency table, and e_{ij} is the expected frequency from the contingency table. The value of χ^2 is the value of statistical testing that would be compared with the value of chi-square table with $(r - 1)(c - 1)$ degrees of freedom. H_0 would be rejected if the value of the statistical testing was more than the value of the table or if the p-value was less than α.

4. Result and Discussions

The results of the evaluation of the application Nitipyuk can be seen in the following figures (Fig. 2 (a), (b)):



(a)



(b)

Fig. 2. (a) Front Page, (b) Bidding List screen

In order for an application to be chosen by clients, it is necessary to have vendors of high quality. According to research by Guo, there are two factors that affect vendor preference in a crowdsourcing marketplace, namely swift trust, determined based on clients' experience in interacting with the vendors, and vendor-task fit, referring to the vendors selected by the admin of the crowdsourcing marketplace during registration. Accordingly, the prototype of the application Nitipyuk specified registration terms that must be followed by vendor candidates to give them a sense of credibility, such as the obligation of having ID proof. It also involved clients' ratings for the vendors who had completed the tasks given.

The prototype of the application was evaluated by 19 users. The first evaluation was carried out by proportion testing based on the variables and the results are shown in Table 1.

Table 1. Proportion testing to evaluate Nitipyuk app

Variable	Proportion	p-value	Description
Interesting application display	0.5263	0.5	Don't reject H_0
Ease of use of the application	0.8421	0.002953	Reject H_0
Facilitate the process of personal shopper business	1	0.00001	Reject H_0
User benefited through the use of the application	0.9474	0.000121	Reject H_0
Ease of use of the features in the application	0.7368	0.03323	Reject H_0
User satisfaction towards the features of the application	1	0.000018	Reject H_0
Worthiness of the application to be widely spread	0.8947	0.000659	Reject H_0

Table 1 shows that Nitipyuk gained good evaluation results as indicated by the proportion of the users who agreed with the statements. Out of the seven statements, only one was receiving disagreement. The testing was conducted by comparing the p-value with the α value. In this research, α value was defined to be 5%. The result of the testing shows that the p-value for the variable application display was 0.5, which was bigger than 0.05. Hence, H_0 was not rejected. This shows that users did not agree that this application has an interesting display. Therefore, it is necessary to improve the user interface design to better attract the users.

Afterwards, evaluation to confirm whether there was a relationship between user satisfaction and the other variables was performed. This was necessary to find out which variables needed correction. The following are the results of the evaluation by independent testing.

Table 2. Independence testing of user satisfaction towards Nitipyuk app

Variable	p-value	Description
Interesting application display	0.4749	Don't reject H_0
Ease of use of the application	0.504	Don't reject H_0
Facilitate the process of personal shopper business	0.04491	Reject H_0
User benefited through the use of the application	0.000258	Reject H_0
Ease of use of the features in the application	0.8035	Don't reject H_0
Worthiness of the application to be widely spread	0.2992	Don't reject H_0

Independent testing was undertaken to find out which of the variables were related to users' satisfaction with the application Nitipyuk. Table 2 presents the results of the independent testing. Based on Table 2, it can be concluded that the application's facilitation for the transaction of personal shopper business and the benefits users obtained from using the application generated user satisfaction. However, the variables application display, ease of use of the application, ease of use of the features in the application, and the worthiness of the application to be widely spread did not have any relationship with user satisfaction.

5. Conclusion

The purpose of this research was to develop an application that is able to give an opportunity to anyone to develop a personal shopper service business through an e-commerce-based crowdsourcing marketplace. To serve the purpose, the application Nitipyuk was developed in this research. From the survey results, it can be concluded that the application Nitipyuk as a crowdsourcing marketplace application is able to open a new e-commerce opportunity by using a C2C model. By applying the concept of marketplace crowdsourcing, it creates a bigger opportunity for requesters as clients and travellers as vendors to finish the tasks given. Proportion testing wasthen performed to find out whether the suggested application has fulfilled user requirements or not. The results of the proportion testing on the seven variables investigated show that the display of the application Nitipyuk needs to be improved to be more interesting. Meanwhile, the other variables showed positive results. Lastly, independent testing was conducted to find out whether the variables were related to users' satisfaction with this application. The results show that the users were satisfied with the application for receiving facilitation with the personal shopper service and feeling benefited from the use of the application. To increase user satisfaction and to allow wider spread, it is deemed necessary to improve the application Nitipyuk in the areas of display and ease of use of the application and the features. Future research is recommended to focus more on the development of user interface and user experience more fitting for a crowdsourcing-based personal shopper marketplace application.

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