User interface redesign of e-commerce platform mobile application (Kudo) through user experience evaluation to increase user attraction

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Abstract. The growth of smartphone users has changed Indonesian society lifestyle towards digital, one of the strongest is to shop online. Some of the obstacles in e-commerce expansion in Indonesia have encouraged the emergence of online-to-offline e-commerce platform mobile applications to tackle this barrier. Competition between the various types of e-commerce in Indonesia has made actors of e-commerce aggressively pursuing a strategy to attract the public to choose and use their e-commerce. User experience (UX) is a very important factor for an application to give a first impression about the company and products offered through the interaction between user and product. Effectiveness, efficiency, error, satisfaction, attractiveness, and visual appeal are the most influential UX dimensions in giving the perception to the user. This study aims to evaluate UX e-commerce platform mobile application by using performance metrics, self-reported metrics, behavioral metrics, and issue-based metrics approach that assess performance, perception, behavior, and filter out user feels as a result of the interaction with applications, and also reveal the effect of experience in using the application. Based on the evaluation, it was found in the dimensions of efficiency and visual appeal was significantly affected by experience factor, and the result indicates the user perception about the application was not good enough, especially on the interface design. Therefore, user interface (UI) redesign was developed using the principles of UI design and Activity Relationship Chart (ARC) by combining the UX elements that have been evaluated, in order to increase user attraction.

1. Background

Currently, e-commerce in Indonesia became one of the popular business and potential. According to DBS Vickers and Asosiasi Penyelenggara Jasa Internet Indonesia (APJII), Indonesia became the biggest e-commerce market in ASEAN surpassed Thailand and Singapore to have a transaction value of US $1.1 billion in 2014. However, behind the high of this value, only about 3-5% of active internet users transacting online. This is caused by problems in Indonesia, namely infrastructure, trust, and the owner of a bank account or credit card that is only 40% (SES Jakarta, 2014).

Kudo or Kios Untuk Dagang Online, is a mobile application e-commerce assisted-based underpinning number of e-commerce (platform) that bridges the online store to offline shoppers through
a network of agents. Since 2014, Kudo started its business with electronic kiosks, developed into a tablet, and finally to the application and mobile web in 2016. These developments continue to be merely an interesting and give satisfaction to users and always use Kudo in their online shopping options. Number of mobile applications based company for online shopping continues to increase, each company compete to provide applications that are liked by the users. One of the most important elements in developing the application is user experience (UX). Some of the main elements that make up the UX is value, adoptability, desirability, and usability [1]. Based on the background that has been described, it is necessary to evaluate UX on the pioneer of e-commerce platform mobile application that is Kudo. The purpose of this study was to determine the conditions of UX in Kudo application in order to obtain combination of UX elements as recommendation that aim to increase user attraction in using the application.

2. User Experience
UX term was coined by Donald Norman, “user experience” covers all aspects of interaction the user to go to the company, services and products. Norman coined this term because he feels that the human interface and usability are too narrow, UX is believed to cover all aspects of a person’s experience with systems including industrial design, graphics, interfaces, physical interaction, and manual. In the ISO standard, UX includes all the emotions, beliefs, preferences, perceptions, physical and psychological responses, behaviours and achievements that occurred before, during, and after using something. However, usability and UX has a different purpose. Usability methods used to improve human performances. While the UX methods used to improve user satisfaction in achieving pragmatic and hedonic quality [2].

Besides often associated with usability, UX is also often associated with user interface (UI). UI is part of the UX, UX focused on anything that affects users journey to solve problems, positive or negative, within and outside the display screen, the UI is focused on how the visual appearance and functionality of a product [3]. UX design and research requires consideration of many dimensions [4]. A review reveals various dimensions of UX including affect/emotion, enjoyment/fun, aesthetics/appeal, hedonic quality, engagement/flow, motivation, enchantment, and frustration [5]. UX has a wide range of scope seen from the various theories and research that have been developed. UX dimensions were measured in this study include the effectiveness, efficiency, error, ease of use, satisfaction, attractiveness, and visual appeal.

3. Research Methodology
Data were collected by using a series of task, which is the main activity that can be done in Kudo application, and the stimulus in the form of video recordings that records the procession task for the eye tracking data retrieval. Table 1 summarizes the specific series of tasks given to respondents.

| Table 1. Task |
|---------------|
| Task | Scenario Task |
| 1 | You are a Kudo agent, you want to login to the application. |
| 2 | You want to buy a product in hobby category, you have Rp500,000 as budget to buy the product |
| 3 | You want to top up voucher to your phone number by Rp50,000 |
| 4 | You want to buy ticket flight from Jakarta to Bali on November, 12th 2016 for 1 adults, choose Air Asia flight at 19:25 |
| 5 | You have finished shopping, you want to top up virtual account balance through Bank Mandiri ATM |

This research was conducted through the four metrics as mentioned before. The performance metrics was aimed to know the performance of users on their interaction with the systems and was measured by the task success, time on task, error and efficiency. The self-reported metrics was aimed to measure the overall user perceptions of their interaction and was measured by the SEQ, SUS, and AttrakDiff.
Behavioural metrics was aimed to know the visual attention in the system display design and was known from the eye tracking results (fixation and area of interest). Issued-Based Metrics was aimed to identify the problems from the interaction of the users and is obtained from the Retrospective think-aloud systems.

4. Result and Discussion

4.1. User Experience Evaluation

Data processing was performed using comparing means to determine the effect of experience on the performance and perceptions of respondents to the application. UX condition in terms of each dimension, effectiveness, efficiency, error, ease of use, satisfaction, attractiveness, and visual appeal, supplemented by the results of the retrospective think-aloud.

Table 2. Results of User Experience Evaluation

| Dimensions               | Result                                                                 |
|--------------------------|------------------------------------------------------------------------|
| Effectiveness            | Respondents capable of completing task 100%                           |
| Efficiency               | Respondents who never been use Kudo application require a longer time  |
| Satisfaction             | From SUS, Kudo application requires improvements to increase user satisfaction in using the application. |
| Ease-of-Use              | To complete the task 2 and 5 users still find it difficult            |
| Error                    | Error or sub-process error occurred in both groups of respondents, especially in tasks 2 and 5 that are products transaction and top up balance. |
| Attractiveness           | Kudo application provides low attraction to users, especially on the attributes of HQ-S |
| Visual Appeal (using eye-tracker) | the most area of interest (AOI) draw eyes attention is ads, headers, and images, but the menu bar below is not visible and make the respondents confused |

4.2. Retrospective Think-Aloud

RTA data obtained through interviews with respondents based on their experience while using Kudo application. From 21 kinds of the main problems that must be repaired from Kudo application divided into five classifications by the number of visualization 8, layout 5, structure 4, content 3, and functionality 1. In processing RTA data, the result of the comments between the SPL and BPL unified because the kind of problems experienced by both groups of respondents are similar. Most complaints related to the design of the interface. RTA results are used as a reference in Kudo application UX improvements through redesign process.

4.3. User Interface Redesign

UX evaluation of Kudo application has been done and it is found that Kudo application performance needs to be improved, especially on the interface. The evaluation results are then used as input to designing the new user interface (UI). The objective of this redesign is to increase user attraction and increase user performance. UI is the face and the first thing discovered by users. With a good UI, users can use the existing features well and getting good UX.

UI improvements are done primarily on the main interface and on the interface of task 2, 3, and 5. The choice of color, font, and the layout is done to generate attractive UI for the user. The method used to design the layout of the display is activity relationship chart (ARC). In accordance with the analysis, the focus in this design is the color, font, layout, and drawing. Selection of color in the redesign of UI is more emphasis on the combination and number of colors used on one page or adjacent elements on the page. The font used on the new UI design is a Roboto font and other family types (light, regular, bold). Size used is 12 pt for the body so that the writing can be clearly seen, and size 14 pt for the title section (header) to look bigger.
Redesign done on the main page, the page before login, the login page, the account page, product category pages, and the page credit and bills. Substantial changes occur on main page, account page, and product category page. Figure 1 is the result of redesigning the main page.

**Figure 1. Main page of Kudo Application**  
Before (left) and After (right)

The main page which initially is a product tab is divided into two: the home page with news, promotions, and selling products and category pages that contain product categories provided in the application Kudo. The initial design that puts the product categories under the page (below the fold) make it difficult for users to find their purpose. Menu bar is located at the bottom of the screen is also eliminated, and replaced by a hamburger button located on top of which is the account tab as shown in Figure 2. It also includes notification and help. In addition, to facilitate user and reduce memory, UI design is made so familiar to the user. Separation pages, menu layout, and account page is similar to the kind of applications based on the results of benchmarking.

**Figure 2. Account Page After Login**  
Before (left) and After (right)

Some differences on the account page that are top up balance button appears only on one place for more effective and user attention focused on one place. The placement of the top up balance button is also placed on the top so that users can easily find it because it is the main activity in the use Kudo application, the use of color writings also have a contrasting color so that the content can be seen clearly.
Products provided by Kudo application consist of online products, pulses, bills, and tickets. In order for users easy to find product offerings, all these products are placed on the upper side and each option has its own tab with the aim of organizing a structured product. One improvement to the online product category tab can be seen in Figure 3.

![Figure 3. Online Product Category Page in Thumbnails form](image)

This tab will no longer use the word ‘product’ but a ‘category’ because ‘product’ should represent all products sold in the application. In addition, the categorization of products grouped into two groups based on the type of product and seller. At first categorization is not separated so impressed unstructured. Filter and sort functions can be used to allow users achieve goals more quickly. Views are also provided in two forms, namely thumbnails and list to give preference preferred by the user. The color of each category was made using the same colors that calm to be consistent. Next improvement is the pulses tab in Figure 4.

![Figure 4. Pulses Page](image)

Initially, the product of pulses in the form of vouchers and the data packets are not visible division and create user confusion when choosing. Therefore, the new design is separated between tabs voucher and data. The design also show consistency by giving the same look as the other tabs, as in the category tab. Pulses tab can also be viewed in a list form with the option ‘display’. In the previous view, there are
two search field that has the same function and also the action button to start searching does not stand out that make it ineffective, so the search field below omitted to be concentrated in a single column.

4.4. Increases in User Attraction

After the redesign process, design verification test were made to the same 16 respondents in the study. Each respondent was given a new UI design and Kudo application sequences process interface. After respondents seeing and knowing the process of doing a main activity in the new design, the respondents were asked to give its ratings of the attractiveness of the new UI through AttrakDiff. From the results of AttrakDiff, it is found that ratings on the new UI design has a higher average rating on each attribute. It is also had a significant increase, obtained through paired t-test on the attributes hedonic quality - identity, hedonic quality - stimulation, and attractiveness sequentially which has a p-value of 0.095, 0.003, 0.000, and 0.001. As for pragmatic quality attribute is not significant. It also proves that UI is able to influence the perception of users on the appeal of an application. Therefore, it can be concluded that the user gets a better UX through the newest on the improved UI design of the Kudo application.

5. Conclusion and Recommendations

This research aims to determine the user experience (UX) on the use of Kudo application. Through the UX evaluation conducted to the UX dimensions, it is concluded that Kudo needed an improvement in the interface so it can ultimately increase user attraction. Redesign of UI is done by combining the results of the evaluation and focuses on the use of colors, fonts, layout and structure by using an approach to UI design principles and Activity Relation Chart. Design of the new UI of Kudo application are proven to increase user attraction within the limits of perception of attractiveness that is measured on the AttrakDiff questionnaire which has an average value.

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