Usability Evaluation of a Fintech Lending Mobile Application for University Student: A Case Study

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Abstract. The rapid development of information technology has changed various sector of our life, including economy. A number of startup companies in Indonesia has been utilized technology to deliver financial services to its customer. One of them attempts to answer the needs of university students in Indonesia for an alternative source of funding, who develop a lending mobile application for student. An initial study using interview and secondary data found that the users still find difficulties to use the mobile application. Usability is one approach that can be used to minimize the problem. The purpose of this study is to increase a fintech mobile application’s usability by conducting evaluation of several features including, ‘creating a new account’, ‘completing profile registration’, ‘applying for university tuition lending’, and ‘applying for goods lending.’ Usability evaluation was conducted by testing the effectiveness, efficiency, and satisfaction through a set of remote usability testing involving 20 participants. The results shows that the mobile application is not optimized in terms of effectiveness, efficiency, and satisfaction as yet. Using the Concept Generation Method, 21 recommendations were proposed to increase the usability of the lending mobile application.

1. Introduction

Technology utilization in Indonesia’s financial lending industry enables lending activity to be conducted more effectively and efficiently, so called financial technology (fintech). According to the Indonesian Financial Services Authority, fintech lending has the most aggressive growth in the overall fintech category. The rapid growth of fintech lending businesses is influenced by public demand for an alternative source of funding which could go beyond geographic limitation, convoluted administration, and other barriers that exist in the traditional financial institution.

This paper studied a fintech lending mobile application, Cicil, which is developed by PT Cicil Solusi Mitra Teknologi. The apps could be downloaded from Google PlayStore. Cicil provides a lending services for university students in Indonesia, particularly for school tuition and purchases of goods. There are administration barriers for university students in Indonesia to access loan services through the traditional financial institution and this lending service aims to help students with a safer yet convenient alternative source of funding for their needs.

A preliminary study was conducted to examine the experience in using the fintech lending mobile application (from now on called lending mob apps). The investigation includes interview and observation to five respondents as well as documentation of user feedbacks in Google PlayStore. Resemblant problems were identified from those three methods that users found it difficult to operate and access the product. There are confusions during the process of proposing the loan in the lending mobile apps and 80% of the respondent claimed that it discourages them to use the lending mobile application even further.
Usability evaluation can be used as an approach to solving the problems in mobile applications in general. Usability is a crucial factor for software products and has a vital role in the success of software product development [1]. Usability describes a product's ability to reach user expectations and evaluation could be conducted through a set of procedures to collect end-user interaction data with the product [2].

This research aimed to evaluate the interface of a lending mob apps from the view of usability by investigating three parameters namely effectivity, efficiency, and satisfaction [3]. The output of the study is a detailed assessment of the mobile application and identification of room for improvements for the application which can be used as a reference for other lending mob apps to improve the interface and use of the apps.

2. Methods

2.1. Usability Testing

The usability testing procedure was conducted remotely via Google Meet (recorded) and several controls have been made. The researcher confirmed all the participant used a mobile phone for the testing (not tablets) with Android Operating System. The testing consisted of three methods: performance measurement, Retrospective Think Aloud (RTA), and questionnaires. Participants were asked to perform four tasks in the mobile application. Performance was measured based on the success rate, total time on task, and errors. The RTA was applied to capture user experience, by asking the participants to reflect their experience of using the application and pointed out the problem they found during the task. They were supported by video recording of their own test session in order to be able to recall the problem and make the most representative justification from it.

Two questionnaires were used to measure user satisfaction that are After Scenario Questionnaire (ASQ, Sauro & Lewis, 2016) and System Usability Scale (SUS, Sauro & Lewis, 2016), with 7-point Likert Scale and 5-point Likert Scale respectively [4]. At the end of every task, participants were asked to fill out the ASQ. The session closed with filling out the SUS after finishing all the tasks, RTA sessions, and post-task questionnaires. Qualitative data collected through the RTA protocols are used to fit up with the questionnaire result for determining the user satisfaction level.

2.2. Participants

There are twenty participants involved in the usability testing (10 males, 10 females) [5]. All of the participants were active university students ranging from 17 to 21 years old. Participants were recruited based on the company’s target market profile consisting new users and existing users with a balanced proportion. New users were university students who have never had prior experience using the mobile application.

2.3. Testing scenario

There are four scenarios/tasks set for the testing procedure. First, participants were asked to create a new account in the mobile application. The second scenario is completing the profile of the user account. Third, the participants were asked to perform a loan request for school tuition and, four, a request for purchasing goods. All the tasks that were set in this research were further divided into subtasks to conduct an in-depth data processing and analysis.

3. Results

3.1. Effectiveness

Tasks in this research were divided into several subtask and the success criteria were defined prior the testing for each of them. A task/subtask with success rate above 70% categorized as effective [5]. There were one ineffective subtask identified in the first task (creating password that met the specifications), two ineffective subtasks in the second task (open profile form easily, find & click the “simpan &
selanjutnya” button), one ineffective subtask in the third task (find & click the “simpan & selanjutnya” button), and no ineffective subtask for the fourth task. Success rate and user group contribution of failure of all task presented in Table 1.

### Table 1. List of ineffective sub task and its success rate (%)

| Task       | Total                                      | New User Group               | Existing User Group          |
|------------|--------------------------------------------|-----------------------------|------------------------------|
| Task 1     |                                            |                             |                              |
|            | Creating password that met the specifications (60%) | Find and click “Daftar” easily (50%) |                               |
|            |                                            | Creating password that met the specifications (50%) |                               |
| Task 2     |                                            |                             |                              |
|            | Open profile form easily (55%)             | Open profile form easily (40%) |                               |
|            | Find & click the “simpan & selanjutnya” button (45%) | Find & click the “simpan & selanjutnya” button (40%) |                               |
| Task 3     |                                            |                             |                              |
|            | Find & click the “simpan & selanjutnya” button (65%) | -                           |                               |
|            |                                            | Find & click the “simpan & selanjutnya” button (50%) |                               |

### Table 2. Time on task and t-test value across different tasks (measured in unit of time: second)

| Task: Create new account | t-value | Total Mean | Total Std. Dev | New User Group Mean | New User Group Std. Dev | Existing User Group Mean | Existing User Group Std. Dev |
|--------------------------|---------|------------|----------------|--------------------|-------------------------|--------------------------|------------------------------|
| 1.1 Find account registration form | 0.00    | 21.55      | 17.75          | 35.1               | 15.71                   | 8                        | 3.23                         |
| 1.2 Fill out account registration form | 0.64    | 44.8       | 10.06          | 45.9               | 11.34                   | 43.7                     | 9.07                         |
| 1.3 Verify and confirm account registration | 0.16    | 60.5       | 15.66          | 66.2               | 16.11                   | 54.8                     | 13.64                        |

| Task: Completing account profile | t-value | Total Mean | Total Std. Dev | New User Group Mean | New User Group Std. Dev | Existing User Group Mean | Existing User Group Std. Dev |
|---------------------------------|---------|------------|----------------|--------------------|-------------------------|--------------------------|------------------------------|
| 2.1 Find profile form           | 0.01    | 53.6       | 58.66          | 88.5               | 67.15                   | 18.7                     | 6.96                         |
| 2.2 Fill out profile form       | 0.02    | 659.5      | 103.24         | 710.5              | 116.31                  | 608.5                    | 56.49                        |
| 2.3 Verify and confirm profile  | 0.03    | 38.9       | 26.12          | 51.6               | 32.44                   | 26.2                     | 5.47                         |

| Task: University tuition loan request | t-value | Total Mean | Total Std. Dev | New User Group Mean | New User Group Std. Dev | Existing User Group Mean | Existing User Group Std. Dev |
|--------------------------------------|---------|------------|----------------|--------------------|-------------------------|--------------------------|------------------------------|
| 3.1 Find university tuition loan page | 0.02    | 12.7       | 12.88          | 19.3               | 15.49                   | 6.1                      | 3.70                         |
| 3.2 Fill out university tuition loan form | 0.01    | 163.5      | 61.29          | 198.3              | 39.40                   | 128.7                    | 60.72                        |
| 3.3 Verify and confirm loan request | 0.13    | 24.5       | 12.56          | 28.8               | 12.51                   | 20.2                     | 11.65                        |

| Task: Goods loan request | t-value | Total Mean | Total Std. Dev | New User Group Mean | New User Group Std. Dev | Existing User Group Mean | Existing User Group Std. Dev |
|--------------------------|---------|------------|----------------|--------------------|-------------------------|--------------------------|------------------------------|
| 4.1 Find goods loan page | 0.02    | 5.45       | 4.41           | 5.9                | 4.98                    | 5                        | 3.97                         |
| 4.2 Fill out goods loan form | 0.00    | 154.6      | 109.54         | 221.6              | 121.74                  | 87.6                     | 23.16                        |
| 4.3 Verify and confirm loan request | 0.07    | 33         | 7.17           | 34.7               | 7.02                    | 31.3                     | 7.27                         |

### 3.2. Efficiency

Efficiency measurement were conducted by looking at the total time on each task and occurrence of error during the task. Subtask were considered inefficient when there is a significant difference in time of New User Group versus Existing User Group. Error on task also indicated inefficiency due to the need of user to revise or re-do the process [6]. There are two inefficient subtasks for task 1 (find account registration form and fill out account registration form); three inefficient subtasks for task 2 (find profile form, fill out profile form, verify and confirm profile); two inefficient subtasks for task 3 (find university
tuition loan page, fill out university tuition loan form); two inefficient subtasks for task 4 (find goods loan page, fill out goods loan form). The time on task, $t$-test value and error for task 1, 2, 3, and 4 are presented in table 2 and table 3 respectively.

### Table 3. List of error occurrence

| Errors in 1st task | Errors in 2nd task | Errors in 3rd task | Errors in 4th task |
|-------------------|-------------------|-------------------|-------------------|
| KA1: Failed to find and click on “daftar” button easily | KB1: Failed to find profile form easily | KC1: Miss to input payment deadline | KD1: Failed to input product URL |
| KA2: Failed to create qualified password | KB2: try to submit the uncomplete personal data form | KC2: Miss in uploading the proof of bill | KD2: Miss filling the seller note |
| KA3: Submitting the form without finishing the questions | KB3: Input wrong optional data | KC3: Input wrong optional data | KD3: Proceed request before finishing the loan request form |
| KB4: try to submit the uncomplete academic data form | KB5: unaware of optional data in students job field | KB6: Miss in uploading ID card | KB7: Miss in uploading ID card and selfie |
| KB8: Miss in uploading Student ID Card | KB9: Miss in registering parents’ phone numbers | KB10: Try to submit uncomplete parents data form |

### Table 4. Results of After Scenario Questionnaire (ASQ)

| Task | ASQ Questions | Mean | New User Group | Existing User Group | Total |
|------|---------------|------|----------------|---------------------|-------|
| 1    | ASQ1          | 5    | 5.6            | 6.1                 | 5.55  |
|      | ASQ2          | 4.9  | 5.5            | 6.1                 | 5.55  |
|      | ASQ3          | 4.7  | 5.5            | 6.1                 | 5.55  |
|      | ASQ4          | 4.1  | 5.5            | 6.1                 | 5.55  |
| 2    | ASQ1          | 4.4  | 5.5            | 6.1                 | 5.55  |
|      | ASQ2          | 4.7  | 5.5            | 6.1                 | 5.55  |
|      | ASQ3          | 4.9  | 5.5            | 6.1                 | 5.55  |
|      | ASQ4          | 4.3  | 5.5            | 6.1                 | 5.55  |
| 3    | ASQ1          | 5.2  | 5.5            | 6.1                 | 5.55  |
|      | ASQ2          | 5.1  | 5.5            | 6.1                 | 5.55  |
| 4    | ASQ1          | 5.1  | 5.5            | 6.1                 | 5.55  |

3.3. **After Scenario Questionnaire (Post-task Questionnaire)**

User satisfaction in each subtask was calculated using the After Scenario Questionnaire (ASQ). ASQ questionnaire in this study consist of 3 questions:

1. *Secara keseluruhan, saya puas dengan kemudahan penyelesaian tugas pada skenario ini*
2. *Secara keseluruhan, saya puas dengan waktu penyelesaian tugas pada skenario ini*
3. Secara keseluruhan, saya puas dengan informasi pendukung yang tersedia (pusat bantuan online, pesan, dokumentasi) ketika menyelesaikan tugas ini

Respond collected in 7-point Likert scale with score 1 as very disagree and score 7 as very agree. Task 2 has the lowest satisfaction among other tasks. The result of the ASQ questionnaire presented in Table 4.

3.4. System Usability Scale (Post-test Questionnaire)
The overall satisfaction measured using the System Usability Scale. In total, the mobile application scored 56.4 out of 100 and compared to previous studies is within the 15-34 percentile [7].

| Table 5. System Usability Scale (SUS) result |
|---------------------------------------------|
| SUS Score | Grade | Percentile |
| New User Group | 46.3 | F | 0-14 |
| Existing User Group | 66.5 | C | 41-59 |
| Total Score | 56.4 | D | 15-34 |

3.5. Retrospective Think Aloud
By using Pareto Method, the researcher prioritizes problems, which identified by the participant in the RTA session for each scenario. The problems prioritized for the 1st, 2nd, 3rd, and 4th scenario could be observed in Table 6.

| Table 6. List of prioritized usability problems |
|-----------------------------------------------|
| 1st Scenario | 2nd Scenario | 3rd Scenario | 4th Scenario |
| Complaints related to verification process | Complaints related to the profile form features | Complaints related to the university loan form features | Complaint related to the product input process |
| Complaints related to the initial steps on making the new account | Complaints related to the instruction to fill the profile form | Complaint related to the loan calculation | Complaint related to form instructions and information |
| Complaints related to the initial steps to complete user profile | Complaint related to diction selection in the profile form | Complaint related to diction selection in the university loan form | Complaint related to the goods loan form features |
| Complaint related to diction selection in the profile form | Complaint related to diction selection in the university loan form | Complaint related to loan submission flow | Complaint related to the loan calculation |
| Complaint related to form instructions and information. |

3.6. Room for Improvements
Referring to the definition of usability from International Organization for Standardization (ISO), a system/product should be effective, efficient, and satisfy the user therefore improvement shall be cultivated when one or more of the parameters are not reached. This research formulates recommendations based on the scenario from the usability evaluation. There are 21 recommendations proposed based on the result of the evaluation of the Mobile Application listed in Table 7. Recommendations formulated using the concept generation method, which consist of 5 steps [8]:

1. Usability problem definition
2. External exploration (benchmarking, external discussion, etc)
3. Internal exploration (internal brainstorming, etc)
4. Concept exploration (combining internal & external exploration)
5. Recommendation design (2D wireframe)
### Table 7. List of improvement recommendations

| No | Scenario | Usability Parameters | Related Errors | Recommendation |
|----|----------|----------------------|----------------|----------------|
| 1  | (1st Scenario) Find account registration form | Efficiency, Satisfaction | KA1 | Resize and shift “Daftar” button |
| 2  | (1st Scenario) Create password | Effectiveness, Efficiency, Satisfaction | KA2 | Create realtime feedback for every password criteria with color indicator. |
| 3  | (1st Scenario) Submit account registration form | Efficiency | KA3 | Differentiate optional and non-optional field using different color and add information about referral code. |
| 4  | (1st Scenario) Account verification | Efficiency, Satisfaction | - | Sending OTP code through SMS |
| 5  | (2nd Scenario) Find profile form | Effectiveness, Efficiency, Satisfaction | KB1 | Re-design profile menu with a clear profile button |
| 6  | (2nd, 3rd, 4th Scenario) Click “Simpan & Selanjutnya” button | Effectiveness, Efficiency, Satisfaction | KB2, KB4, KB6-KB22, KB24-KB32, KC1, KC2, KC5, KC6, KD2 | Move “Simpan & Selanjutnya” button to the end of the form |
| 7  | (2nd, 3rd, 4th Scenario) Upload photos | Efficiency, Satisfaction | KB7, KB8, KB17, KB18 | Redesign upload status bar with clear status and color indicator. |
| 8  | (2nd Scenario) Input unregistered faculty | Efficiency, Satisfaction | - | Shift additional faculty button below the registered faculty |
| 9  | (2nd, 3rd, 4th Scenario) Input date information | Efficiency, Satisfaction | KC1 | Use dropdown menu for to input date information |
| 10 | (2nd Scenario) Input GPA | Efficiency, Satisfaction | KB23 | Create GPA sample |
| 11 | (2nd Scenario) Information about emergency contact person | Efficiency, Satisfaction | - | Create “rumah” option |
| 12 | (2nd Scenario) Input optional and non-optional information | Effectiveness, Efficiency, Satisfaction | KB3, KB5, KC3 | Differentiate optional and non-optional field using different color |
| 13 | (2nd Scenario) Input Guarantor (penjamin) data | Efficiency, Satisfaction | KB33 | Create pop-up information about Guarantor (Penjamin) |
| 14 | (3rd & 4th Scenario) Initiate loan request | Effectiveness, Efficiency, Satisfaction | KC4, KD1 | Change “Simulasi Cicilan” button to”Mulai Hitung Cicilan” button |
| 15 | Add loan button in “Cicilan” tab | - | | |
| 17 | (3rd & 4th Scenario) input down payment | Efficiency, Satisfaction | - | Empty down payment field as default |
| 18 | (3rd & 4th Scenario) Loan calculation | Efficiency, Satisfaction | - | Add pop up information about load detail |
| 19 | (3rd Scenario) Loan insurance information | Efficiency, Satisfaction | - | Add pop up information about loan insurance |
| 20 | (4th Scenario) Input product’s URL | Efficiency, Satisfaction | KD1 | Create how-to information to input product’s URL under URL field. |
| 21 | (4th Scenario) create note for seller | Efficiency, Satisfaction | KD2 | Remove "Keterangan tambahan produk" |

### 4. Conclusions
Usability testing has been conducted to the Fintech Lending Mobile Application involving three parameters: effectiveness, efficiency, and satisfaction. According to the result, the mobile application still has room for improvements in regards with the usability aspect. In total, there are 4 out of 12 subtasks
were identified as ineffective and 9 out of 12 subtasks were identified as inefficient category. The overall satisfaction of the mobile application was measured using the System Usability Scale with the score result 56.4 out of 100 points which is considered as low user satisfaction. In order to achieve a better usability for the mobile application, 21 interface recommendations were formulated and had passed the initial validation as proper solutions for the existing usability problems.

It should be taken into consideration that the evaluation sessions for all of the participants was held online and remotely, while it is considered as a good alternative if an in-house usability testing was not possible to conduct [9]. As a control, the researcher makes sure that all the devices used by participants are mobile phones (not tablets) with Android OS. For further research, it is recommended to conduct further usability testing, such as the AB testing for the 21 recommendation that is already formulated in this study.

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