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***USABILITY EVALUATION OF FLIP APPLICATIONS USING  
COGNITIVE WALKTHROUGH AND THINK ALOUD  
EVALUATION METHODS***

**TUGAS AKHIR**

Diajukan Sebagai Salah Satu Syarat  
untuk Memperoleh Gelar Sarjana Komputer pada  
Program Studi Sistem Informasi

Oleh:



**FANNISHA**

**11950321550**



UIN SUSKA RIAU

UIN SUSKA RIAU

**FAKULTAS SAINS DAN TEKNOLOGI  
UNIVERSITAS ISLAM NEGERI SULTAN SYARIF KASIM RIAU  
PEKANBARU**

**2023**

**LEMBAR PERSETUJUAN**

***USABILITY EVALUATION OF FLIP APPLICATIONS USING  
COGNITIVE WALKTHROUGH AND THINK ALOUD  
EVALUATION METHODS***

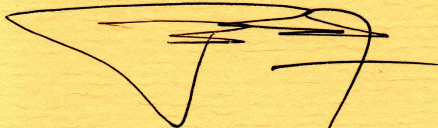
**TUGAS AKHIR**

Oleh:

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**11950321550**

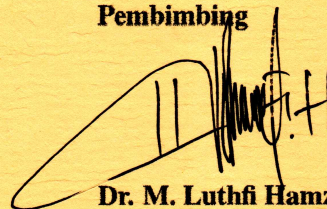
Telah diperiksa dan disetujui sebagai Laporan Tugas Akhir  
di Pekanbaru, pada tanggal 05 Juni 2023

**Ketua Program Studi**



**Eki Saputra, S.Kom., M.Kom.**  
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**Dr. M. Luthfi Hamzah, B.IT., M.Kom.**  
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## LEMBAR PENGESAHAN

### *USABILITY EVALUATION OF FLIP APPLICATIONS USING COGNITIVE WALKTHROUGH AND THINK ALOUD EVALUATION METHODS*

#### TUGAS AKHIR

Oleh:

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Telah dipertahankan di depan sidang dewan penguji  
sebagai salah satu syarat untuk memperoleh gelar Sarjana Komputer  
Fakultas Sains dan Teknologi Universitas Islam Negeri Sultan Syarif Kasim Riau  
di Pekanbaru, pada tanggal 09 Mei 2023

Pekanbaru, 09 Mei 2023

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**Sekretaris : Dr. M. Luthfi Hamzah, B.IT., M.Kom.**

**Anggota 1 : Eki Saputra, S.Kom., M.Kom.**

**Anggota 2 : T. Khairil Ahsyar, S.Kom., M.Kom.**

## LEMBAR HAK ATAS KEKAYAAN INTELEKTUAL

Tugas Akhir yang tidak diterbitkan ini terdaftar dan tersedia di Perpustakaan Universitas Islam Negeri Sultan Syarif Kasim Riau adalah terbuka untuk umum, dengan ketentuan bahwa hak cipta ada pada penulis. Referensi kepustakaan diperkenankan dicatat, tetapi pengutipan atau ringkasan hanya dapat dilakukan atas izin penulis dan harus dilakukan mengikuti kaedah dan kebiasaan ilmiah serta menyebutkan sumbernya.

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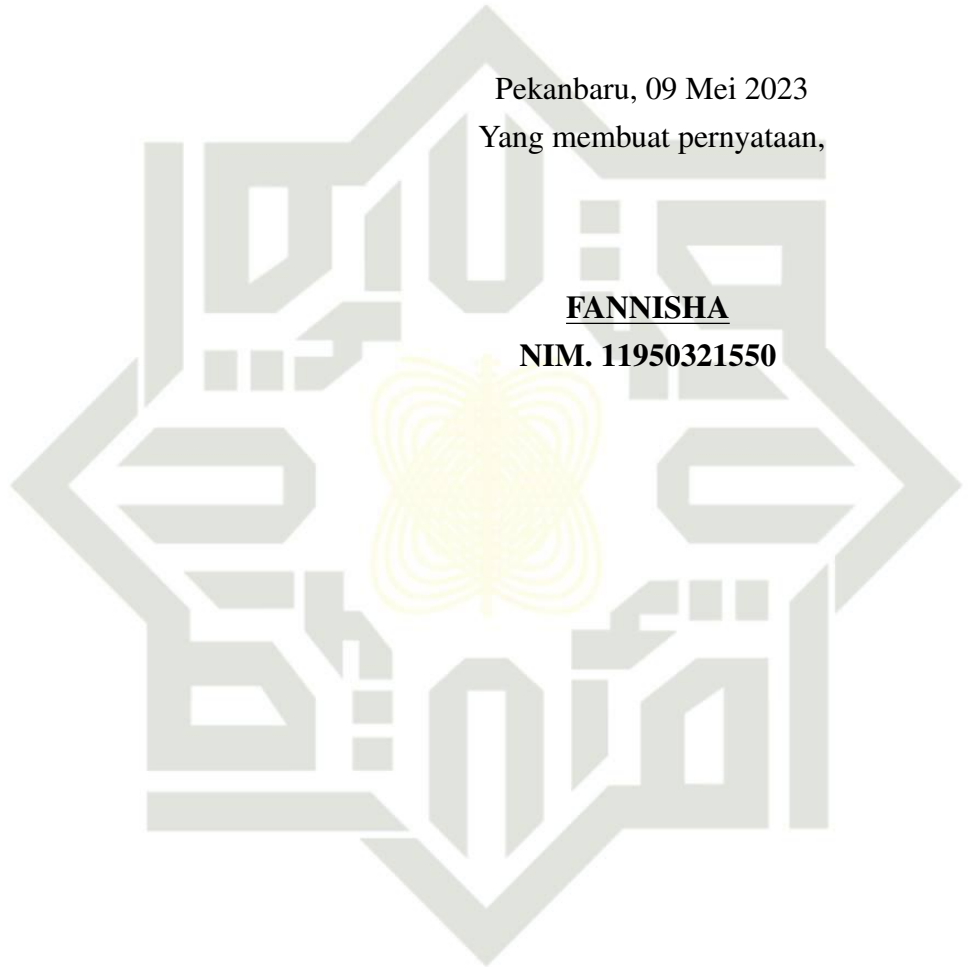
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Pekanbaru, 09 Mei 2023

Yang membuat pernyataan,

**FANNISHA**

**NIM. 11950321550**



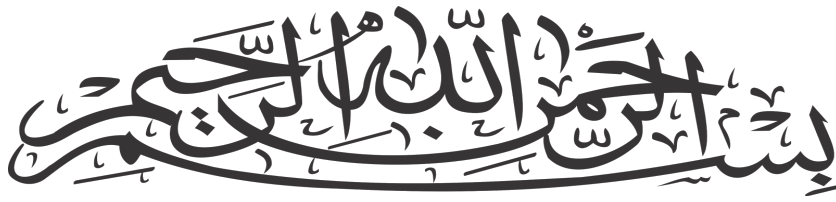
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## LEMBAR PERSEMBAHAN



*Barang siapa yang hendak menginginkan dunia, maka hendaklah ia menguasai ilmu. Barang siapa menginginkan akhirat hendaklah ia menguasai ilmu, dan barang siapa yang menginginkan keduanya (dunia dan akhirat) hendaklah ia menguasai ilmu” (HR. Ahmad)*

Sujud syukurku kusembahkan kepada-Mu Allah *Subhanahu Wa Ta’ala* yang Maha Agung, yang Maha Tinggi, yang Maha Pengasih, lagi Maha Penyayang atas takdir-Mu telah Engkau jadikan aku manusia yang senantiasa berfikir, berilmu, beriman, dan bersabar serta bersyukur dalam menjalani kehidupan ini. Semoga keberhasilan ini menjadi satu langkah awal yang baik bagiku meraih cita-cita besarku. Lantunan *Al-Fathihah* beriringan shalawat dan salam, kuhanturkan kepada Baginda Nabi yang membawa cahaya bagi kita semua Rasulullah Muhammad *Shallallahu ’Alaihi Wa Sallam*.

Waktu yang sudah kujalani dengan jalan hidup yang sudah menjadi takdirku, sedih, bahagia, dan bertemu orang-orang yang memberiku sejuta pengalaman bagiku yang telah memberi warna-warni kehidupanku. Kasih sayang Ayahanda dan Ibunda tercinta yang begitu tulus untukku. Persembahan teristimewaku berikan untuk kedua orang tuaku yang banyak berperan dalam perjalanan hidupku selama ini atas lantunan doa-doa, pengorbanan, dan kerja kerasnya yang terbaik sehingga aku dapat merampungkan Tugas Akhir ini guna untuk memperoleh gelar sarjana.

Usaha, semangat, dan kerja keras yang diiringi dengan keikhlasan hati dan kesabaran. Semoga ilmu yang telah diajarkan dan yang telah aku peroleh menuntunku menjadi manusia yang berharga di dunia dan di akhirat nantinya. *Aamiin*.

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## KATA PENGANTAR

*Assalamu'alaikum Warrahmatullahi Wabarakaatuh*

*Alhamdulillah Wa Syukurillah*, ungkapan puji syukur peneliti haturkan atas kehadiran Allah *Subhanahu Wa Ta'ala* atas segala rahmat dan karunia-Nya sehingga peneliti dapat menyelesaikan Tugas Akhir ini dengan baik dan tepat waktu. Shalawat serta salam kita ucapkan kepada Nabi Muhammad *Shallallahu 'Alaihi Wa Sallam* dengan mengucapkan *Allahumma Sholli'Ala Sayyidina Muhammad Wa'Ala Ali Sayyidina Muhammad*. Tugas Akhir ini dibuat untuk menyelesaikan dan memperoleh gelar Sarjana Komputer di Program Studi Sistem Informasi Universitas Islam Negeri Sultan Syarif Kasim Riau.

Banyak pihak pemangku kepentingan yang terlibat dalam Tugas Akhir ini, yang telah memberi peneliti bimbingan, bantuan, nasihat, petunjuk, perhatian, serta semangat. Maka dari itu, peneliti ucapkan terimakasih kepada:

1. Bapak Prof. Dr. Hairunas, M.Ag sebagai Rektor Universitas Islam Negeri Sultan Syarif Kasim Riau.
2. Bapak Dr. Hartono, M.Pd sebagai Dekan Fakultas Sains dan Teknologi.
3. Bapak Eki Saputra, S.Kom., M.Kom sebagai Ketua Program Studi Sistem Informasi sekaligus Penguji I peneliti yang telah memberikan masukan, arahan, dan saran pada Tugas Akhir ini.
4. Ibu Siti Monalisa, ST., M.Kom sebagai Sekretaris Program Studi Sistem Informasi.
5. Bapak Anofrizen, S.Kom., M.Kom sebagai Ketua Sidang Tugas Akhir peneliti yang telah meluangkan waktu, memberikan motivasi, masukan, serta arahan demi kelancaran Sidang Tugas Akhir ini.
6. Ibu Zarnelly, S.Kom., M.Sc sebagai Dosen Pembimbing Akademik peneliti yang telah memberikan bimbingan serta nasihat selama masa perkuliahan yaitu sejak Semester 1 hingga Semester 8.
7. Bapak Dr. Muhammad Luthfi Hamzah, B.IT., M.Kom sebagai Dosen Pembimbing peneliti dalam Tugas Akhir ini. Terimakasih sebesar-besarnya atas bimbingan, bantuan, nasihat, arahan, motivasi, serta dukungan tiada hentinya yang telah diberikan sehingga Tugas Akhir ini dapat diselesaikan dengan baik sampai saat ini.
8. Bapak T. Khairil Ahsyar, S.Kom., M.Kom sebagai Kepala Laboratorium Program Studi Sistem Informasi sekaligus Penguji II peneliti yang telah berkenan memberikan saran dan arahan yang bermanfaat pada Tugas Akhir ini.

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9. Seluruh Bapak dan Ibu Dosen Program Studi Sistem Informasi yang telah banyak memberikan ilmunya kepada peneliti. Semoga ilmu yang diberikan dapat peneliti amalkan dan menjadi amal jariyah.
10. Seluruh Pegawai dan Staff Program Studi Sistem Informasi yang telah bersedia meluangkan waktu dan tenaga untuk membantu dan mempermudah proses administrasi Tugas Akhir ini.
11. Kedua orang tuaku, Ummi dan Abi tersayang Nurbariani dan Hendrizof Halim yang selalu mendoakan, memberikan dukungan, memberikan perhatian, memberikan kasih sayang, dan juga semangat. Terimakasih atas semua pengorbanan dan kerja keras yang telah kalian lakukan dengan penuh keikhlasan demi menuju kesuksesan anakmu ini. Semoga Allah *Subhanahu Wa Ta'ala* selalu menjaga dan melindungi Ummi dan Abi dimanapun kalian berada.
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13. Kepada teman-teman seperjuangan semasa perkuliahan dan Tugas Akhir, yaitu Dimas Fajar Sulaiman, Fatika Putri, Syari'ah Islami, Dinda Sofianti, dan Yolanda Yeza. Terimakasih untuk segala perhatian, bantuan, dan dukungan yang tiada henti telah kalian berikan sampai detik ini. Kalian terhebat, semoga Allah *Subhanahu Wa Ta'ala* selalu mengiringi setiap langkah perjuangan kita sehingga kita dapat sukses bersama-sama. *Aamiin*.
14. Terimakasih atas diriku sendiri untuk perjalanan yang telah dilalui, sudah kuat, dan pantang menyerah dalam memperjuangkan gelar Sarjana Komputer (S.Kom) ini. Maaf telah sering memaksa untuk terus berjalan meski lelah. Semoga lelah dan jerih payah ini akan terbayar suatu saat nanti.
15. Seluruh teman-teman Sistem Informasi Angkatan 2019 khususnya Kelas G, yang telah memberikan bantuan dan inspirasi dalam penyusunan Tugas Akhir ini.
16. Semua pihak yang tidak dapat peneliti sebutkan satu-persatu yang terlibat dalam perjuangan penyelesaian pendidikan Strata 1 (S1) yang telah memberikan bantuan, dukungan, motivasi, dan semangat kepada peneliti, baik dalam pengumpulan data maupun dalam penyusunan Tugas Akhir ini. Semoga segala doa, motivasi, dan dukungan yang telah diberikan selama ini menjadi amal kebajikan dan mendapat balasan setimpal dari Allah *Subhanahu Wa Ta'ala*. Peneliti menyadari bahwa dalam penulisan Tugas Akhir ini masih banyak

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terdapat kekurangan dan jauh dari kata sempurna. Untuk itu kritik dan saran yang membangun sangat peneliti harapkan demi kesempurnaan Tugas Akhir ini.

*Wassalamu'alaikum Warahmatullahi Wabarakaatuh*

Pekanbaru, 05 Juni 2023

Peneliti,

**FANNISHA**  
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## ICSTSN 2023 - Paper Status - ID 112

ICSTSN 2023 < icstsn2023@ifet.ac.in >

Sat, Mar 18, 2023 at 22:51

From: 190331150@students.uin-suska.ac.id, muhammad.luthfi@uin-suska.ac.id, eki.saputra@uin-suska.ac.id, tengkukhairil@uin-suska.ac.id

Dear Author,

We have now completed the review of your paper ID '112', titled as " **Usability Evaluation of Flip Application Using Cognitive Walkthrough and Think Aloud Evaluation Methods** " .

Based on the recommendations from the reviewers assigned for your paper, we are pleased to inform you that your paper has been **ACCEPTED** by the **Technical Program Committee (TPC)** for **ORAL PRESENTATION** at Second IEEE Sponsored International conference on Smart Technologies and Systems for Next Generation Computing (**ICSTSN 2023**) to be organized on **April 21<sup>st</sup> and 22<sup>nd</sup> 2023 (Hybrid Mode)**.

The reviewer's comments can be accessed by login to your CMT user account.

The reviewer's comments are also attached herewith.

1. **Technical Quality (Technical contribution in the proposed method, results and comparative performance)**
- 4: Good
2. **Presentation Quality (IEEE conference format- 2 column; Figures- readable, axis, legend; Tables- readable, units)**
- 3: Average
3. **Clarity (Quality of English, background study, clear description of the concept and methodology, visible contribution, explanation of results/findings and detailed analysis)**
- 4: Good
4. **References and Literature Survey (Relevance, quality, publication year of references, if the references are properly cited, if major references are missing. Please notify authors in the comment section, if they do not consider recent publications or miss major references in the literature survey.)**
- 3: Average
5. **Overall Presentation and state-of-art quality (out of 5)**
- 4/5
1. "The paper presents a novel contribution to the field and has the potential to advance knowledge in this area."
2. "The paper clearly communicates the research question, methods, results, and implications, and is well-organized and well-written."
3. "The paper incorporates current research and theoretical perspectives on the topic, and contributes to a deeper understanding of the phenomenon."
4. The authors provide a clear and concise explanation of their research design and methodology, bolstering the credibility of their findings.
6. **Comments to the authors (Your suggestions are extremely important for the authors to improve the quality of the paper. We kindly request you to provide feedback to authors.)**
1. "The paper presents a novel contribution to the field and has the potential to advance knowledge in this area."
2. "The paper clearly communicates the research question, methods, results, and implications, and is well-organized and well-written."





Your paper ID: **ICSTSN 112**, has been **ACCEPTED**

ICSTSN 2023 < csten2023@ifet.ac.in >

Thu, Mar 23, 2023 at 23:26

to: 1900371100@students.uin-suska.ac.id, muhammad.luthfi@uin-suska.ac.id, eki.saputra@uin-suska.ac.id, tengkukhairil@uin-suska.ac.id

Dear Author,

**Congratulations!!!**

The review and selection process for your paper ID **ICSTSN-112** entitled "**Usability Evaluation of Flip Application Using Cognitive Walkthrough and Think Aloud Evaluation Methods**" has been completed. Based on the recommendations from the reviewers assigned for your paper, I am pleased to inform you that your paper has been **ACCEPTED** by the **Technical Program Committee (TPC)** for **ORAL PRESENTATION** which is organized by IFET College of Engineering, Villupuram, Tamil Nadu, India during **21<sup>st</sup> - 22<sup>nd</sup>**, April 2023. I am also glad to inform you that the proceedings of ICSTSN 2023 will be submitted for inclusion in IEEE Xplore.

**Note** Conference will be held in both **OFFLINE and ONLINE MODE**.

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You are further requested to do the following

You are requested to kindly **register** at the earliest (after paying the Conference Registration Fees) using the Registration Link.  
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**Final submission Checklist**

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1. Camera ready paper in IEEE double column format (in Microsoft office word file) should be uploaded in the CMT portal.
2. Filled in Google form.
3. Proof of registration fee paid.

**(The final paper should not exceed 6 pages, IEEE Xplore does not support pages more than**

**6. Rs.500 will be charged for every extra page)**

With Regards,

**Conference Coordinator**

ICSTSN-2023

Syarif Kasim Riau



# Usability Evaluation of Flip Applications Using Cognitive Walkthrough and Think Aloud Evaluation Methods

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transactions [34][35]. However, this only applies to state-owned banks to non-state-owned banks and for fund transfers among state-owned banks, there is no administration fee. This also applies to e-wallets where there are no inter-collaboration online payments.

The Flip application is an application tool for transferring funds between banks and top-up e-wallets without incurring administration fees when making transactions. The use of the Flip application is not only limited to domestic transactions but also includes international transactions and has worked with more than 100 banks in Indonesia and 48 countries. In addition to fund transactions, the Flip application also offers services for buying credit, data packages, electricity tokens, and PDAM with agent price offers. In addition, the Flip application also provides services for companies. Where you can make automatic inter bank transfers to thousands of accounts at once and accept online payments on one platform, which has been trusted by more than 800 companies in Indonesia. Under the auspices of PT. Fliptech Lentera Inspirasi Pertiwi, the Flip application has been licensed, licensed, and supervised by Bank Indonesia with License Number 18/196/ DKSP/68, since 2016. This can be proven by the public's trust in this application, with more than 10 million users and 420 thousand reviews with a rating of 4.4/5.0 on the Play Store [3][36].

A survey was conducted on 30 respondents using the Flip application in the reviews on Google Play Store based on the order of the most relevant reviews, in the context of pre-evaluation research usability to assess what users feel and find out if there are problems with the Flip application. There are several problems described by respondents, including:

1. Transactions that take a long time to wait. It's not only the money transfer, such as e-wallet top-up transactions, electricity/data purchases, and filling process that takes up to 20-30 minutes to wait.
2. After making a transfer, the user is required to confirm the proof of the transaction. Previously,

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**Abstract**— The Flip application is a digital financial service that makes it easy for users to transfer between national and international banks without administrative fees, there are also digital wallet services such as purchasing credit, electricity, and other. Creating a good user experience, it takes an evaluation of the usability of the Flip application, to find out the level of user satisfaction and identify problems. Therefore, it is necessary to evaluate usability using cognitive walkthrough and think-aloud methods by performing task scenarios and assessments from the user's perspective on the Flip application. The test was carried out on 100 respondents in the Pekanbaru city area. Based on the test results, the effectiveness rate was 92.3% and the efficiency level was 0.22 goals/sec as well as the satisfaction level based on the method used value which can be seen from the problems caused are not included in the fatal category and the positive response of respondents regarding the evaluation. This shows that the Flip application is very good but still needs improvement to be used more optimally. Recommendations are given as a reference in developing and improving applications in overcoming problems from the test results. Recommendations are interface improvements including appearance, indication, function, and operation of the Flip application.

**Keywords**— *flip application, evaluation, usability, cognitive walkthrough, think aloud*

## I. INTRODUCTION

Law Number 3 of 2011 concerning Fund Transfers in article 1 point 1, a transfer is a process that begins with an order from the sender and aims to send a certain amount of money to the recipient until the recipient gets a certain amount [1]. In general, fund transfers to m-banking, and e-wallets may incur a fee for each transaction. This has been regulated based on Bank Indonesia Regulation or PBI Number 14/23/PBI/2021 concerning Fund Transfers, in these rules it is stated that each transfer provider has the right to charge a fund transfer fee by understanding the policy provisions [2]. In accordance with these Bank Indonesia regulations, an administration fee is stipulated for inter-bank



use transferred a certain amount of money with a QR code provided by the Flip application. With this unique code, the system can automatically read.

The Flip application uses an automatic log-out system if the user does not open an account for a week or security purposes. With automatic logging out, users find it difficult, because they have to log in again using their email and password or code verification.

Some features and services need to be added, users feel the need for improvement on menu icons, shortcuts, and layout to make it simpler and easily accessible. Users find it a bit complicated about where should I click which menu to select.

Responses and services related to complaints from users are still relatively poor. Many users feel that they are not getting service or a fast response to the problems raised.

Some of the problems that occur from the reviews by users, problems can be identified with the level of user satisfaction [4], but evaluation is needed usability to identify and fix problems and improve the usability of the Flip app. Besides, will if the system can do what the user wants, but the user cannot find it because the display is difficult to understand [5]. Apart from evaluating usability, can also increase the progress of user capture, increase productivity and increase the performance or results of a system.

Evaluation usability is one of the evaluations that is used to determine the quality between products and users' evaluation [7]. Usability is also used to assess whether user interaction with the application is going well. ISO-9241-11 defines usability with 3 aspects namely effectiveness, efficiency, and satisfaction. A product is said to be effective if the user succeeds in achieving the goals of the software [8]. Efficient includes the amount of running of users to achieve goals. And satisfaction is related to the attitude of user acceptance of the software. If the performance of a product can meet the needs of the user, the level of user satisfaction will be high, otherwise, it will decrease [9][31]. If the results obtained exceed expectations, the user will feel very satisfied.

Walkthrough takes a method in conducting the evaluation of usability to process and identify data [10][33]. Cognitive Walkthrough is a method for detecting problems in the interface by submitting a series of tasks to the user [11]. The tasks given are in the form of scenarios that must be done to see the extent of user knowledge and errors made by users in using the application. Think Aloud Evaluation is a method that openly expresses the thoughts, feelings, and opinions of users when interacting directly with applications using task scenarios [12]. This method is considered to have a significant influence and can provide an overview of the evaluations carried out as well as the dominant method of testing usability. These two methods will be used to measure the level of user satisfaction with the Flip application and provide recommendations for improvement from the evaluation results.

## II. LITERATURE REVIEW

### A. Financial Technology (fintech)

FinTech is the result of a collaboration between banking technology and business technology which gradually transforms conventional business models into more modern ones. Where previously transactions took long periods of time with large amounts of cash to be exchanged. FinTech Indonesia's main business includes moving money internationally or globally, making it easy to transfer money from anywhere in the world, even from people who have never received it before. Financial technology has three types of services, namely as follows: Third-party payment systems, Peer-to-Peer (P2P) Lending, and Crowdfunding [13]. The Flip app uses a concept third-party payment system, which worked as an intermediary between banks. This is the basis for why transactions are free of administration fees [14].

### B. Usability

According to [15] Jacob Nielsen in his book, mentions five attributes to know usability of interfaces, that is Learnability, Error, Efficiency, Memorability, and satisfaction [15]. Flip-based application effectiveness measurement standards learnability and erroring calculations success rate interpreted based on the 1991 Debdagri Research and Development Reference, with a ratio scale  $\geq 40\%$  up  $\leq 80\%$  [16], as shown in Table 1 below.

TABLE I. MEASUREMENT SUCCESS RATE

No	Effectiveness Ratio	Category
1	$\geq 40\%$	Very Ineffective
2	40% - 59.99%	Ineffective
3	60% - 79.99%	Effective enough
4	$\leq 80\%$	Very effective

The measurement of the efficiency of the Flip application is also determined by the results of the average time required to complete the task scenarios presented using time behavior so that the results of measuring the efficiency of the Flip application can be understood [17], they are in Table 2 [18].

TABLE II. MEASUREMENT TIME BEHAVIOR

No	Time Duration	Qualification
1	60-300/Sec	Very Fast
2	360-600/Sec	Fast
3	660-900/Sec	Slow

### C. Sampling Technique

Used a random sampling technique in the sample population for testing [19]. The use of random sampling technique is based on the fact that there are no special characteristics of the sample, each population has the same right to be sampled. The number of Flip app users based on download data at the Google Play Store. 10 million users. The sample data source focuses on Flip application user respondents in the city of Pekanbaru. However, the number of users in the city of Pekanbaru is unknown. Then the number of samples with Lameshow obtained is 96.04 [20]. Then the results of calculating the number of samples are rounded up to 100

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100 samples, which will later become research respondents in the Pekanbaru city area.

G. Cognitive Walkthrough

Cognitive Walkthrough is a theory-based method, in which the evaluator evaluates each step necessary to perform a scenario-based task and looks for a problem in usability that will interfere with learning by exploring a product or application [21]. There are five measurement parameters in the Walkthrough namely: the success of the task viewed from the user/respondent, the time needed to do the task, the number of reflexes/errors made, efficiency of users (number of clicks), and Ability to learn the application. Cognitive Walkthrough includes two phases: preparation with four phases covering literature studies studying the system being tested, determining respondents and compiling scenarios of tasks that must be carried out by respondents, and execution with one phase including analysis of results [22].

H. Think Aloud Evaluation

Think Aloud is a popular way of gathering information by viewing interactions with users. This technique is used to evaluate systems involving users, also known as end users, by expressing in detail what user feel and think when using the system [23]. Think Aloud can be identified into two basic types namely, Concurrent Think Aloud, making participants express the user's thoughts during the implementation of the task scenario given, and Retrospective Think Aloud, which makes participants express their judgments or arguments after the scenario task is done [24]. It has the simple advantage that it requires little knowledge to perform and provides a useful understanding of the interface and can also be used to observe how the system is used.

III. METHODOLOGY

The research methodology is the stages that will be carried out during the research process, in this chapter an explanation of each stage of the research will be discussed.

A. Planning Stage

Information or data obtained directly from the research object. Three ways were carried out, namely observation, interviews, and distributing questionnaires. Observations were made by observing and directly accessing the Flip application. Then interviews were conducted with several application users in Pekanbaru City. Next is the questionnaire distributed to 100 respondents to find out the problems that occur.

A. Data Processing Stage

Recapitulation of descriptive data using Microsoft Excel software. Using the parameters of task success, the number of errors, and the amount of time the respondent completed the task and observing the respondent and the respondent's point of view while working on the task on the Flip application for data processing. Conclusions were also made on the basic knowledge of the respondents in learning the Flip application.

B. Analysis Stage and Results

An analysis is carried out on usability to measure and determine the efficiency, ease of learning, and ability to remember how to interact without difficulty or error in the Flip application. In order to make it easier to determine and classify the aspects of the problem that must be improved or developed even better.

C. Recommendation

This stage provides an explanation regarding the discussion of conclusions from the analysis and recommendations in the form of input, from a list of problems that have been found based on the evaluation results of the Flip application. The recommendations made can be used to improve and develop the Flip app, in terms of appearance and usability. The flow of the research stages can be seen in the flowchart of Figure 1.

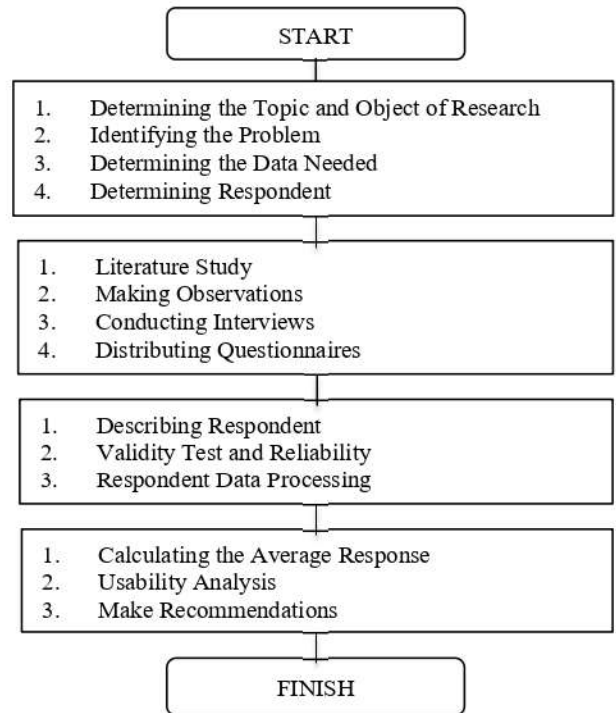


Figure 1. Methodology Study

IV. RESULT AND DISCUSSION

A. Task Scenario Selection

The first step in research preparation is using the method of Cognitive Walkthrough and methods Think Aloud to determine which task scenarios will be given and done to the respondent.

TABLE III. TASK SCENARIO

Code	Task Scenario	Stages
TS1	Bank Account Transfer/E-Wallet	11
TS2	Purchase Credit/Data/ Electricity/ Top Up Balance	6
TS3	Help Center	5

Table 3. is the choice of task scenarios along with the number of stages of the process. When working on the task scenario given to the respondent, obstacles will be

seen as well as the extent to which the respondent can carry out the stages of the task given properly and correctly.

## 2. Calculation Effectiveness and Efficiency

a. To find out the effectiveness of the Flip application is determined by analyzing successful tasks and completion rate 1 of and partial success with a completion rate of 0, the efficiency level of the Flip application was seen by measuring time-based efficiency in carrying out the task scenarios [25], then user success was determined by conducting an analysis using the Cognitive Walkthrough and Think Aloud.

$$\text{Success Rate} = \frac{\text{Success Task} - (\text{Partial Success} \times 0,5)}{\text{Total Task}} \times 100\% \quad (1)$$

$$\text{Success Rate} = \frac{245 - (46 \times 0,5)}{300} \times 100\% = 92,3\%$$

The app effectiveness percentage of success rate obtained from calculations using equation (1). The results obtained were 92.3% with a very effective category. However, several tasks were wrong/unable to be completed by the respondents. The highest failure rate was ST1 because the average respondent was confused with the first step in finding the transfer menu icon or writing that the respondent did not understand.

$$\text{Time Based} = \frac{\sum_{j=1}^R \sum_{i=1}^N N_{ij}}{NR} \quad (2)$$

$$\text{Time Based} = \frac{68,90}{300} = 0,22 \text{ goals/sec}$$

The time required by the respondents to complete the task were analyzed time-based. The results of the calculations in equation (2) show that the respondents' average time usage is 0.22 goals/sec. Is a value in the very fast category, the longest time is in ST1 with an average duration of 106.65 goals/sec because the average respondent needs to choose by paying attention to the display that is appropriate to the task, there are icons and written commands that are ambiguous with what is stated to do Duty.

## C. Respondent Descriptive Analysis

Of the total sample of respondents who were evaluated in this study, there were 100 people. In the gender category, there were 37 men and 63 women, with an age range of 20-33 years totaling 97 people and with an age range of 34-47 years totaling 3 people, which were old user categories namely 66 people and new user categories namely as many as 34 people. The percentage data graph can be seen in Figure 2.

## D. Problem Seriousness

An assessment was made of the respondent's statements regarding the questions asked with a value range of 1 to 5 [32], this assessment will indicate the level of the respondent's problem regarding functions and operations as a guide for determining the level of serious problems that will arise [26]. table 4 is a category of value problems.

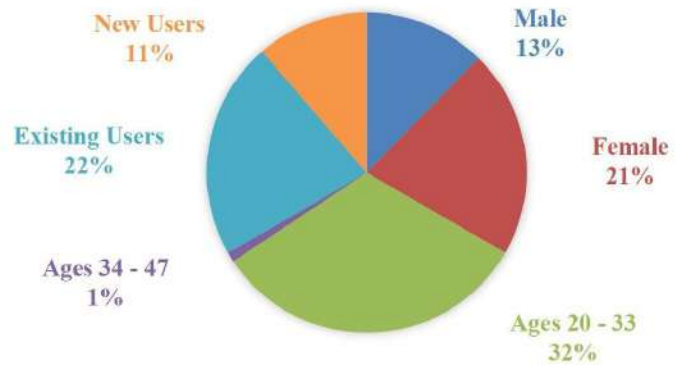


Figure 2. Percentage of Respondent Data

TABLE IV. TASK SCENARIO

Score	Word Assessment	Description
5	Yes	Most likely it will work
4	Yes maybe	Chances are it will work
3	Don't know	Between success and failure
2	Not sure, for sure	Low success rate
1	Not	Failed / Unsuccessful

## E. Problem Type

In determining the problem usability by using the

method Cognitive Walkthrough, respondents will be asked questions regarding the evaluation analysis of the Flip the application as a whole to find out whether the system can direct respondents to be able to use Functions and operations properly and correctly. Analysis criteria question [27]:

1. Will the user try to achieve the correct result?
2. Will the user notice that the correct action is available?
3. Will users associate the right actions with the results they want to achieve?

Once the action is performed, will the user see progress made toward the goal?

Problem Type (PT)	Explanation	Source
User (U)	The problem comes from user experience and knowledge.	Question 1 and 3
Hidden (H)	The display has no indication or hint about the available functions	Question 2
Text and Icon (T)	Placement, appearance and content can easily be misinterpreted or misunderstood.	Question 3
Sequences (S)	Functions and operations must be performed in an unusual order.	Question 1
Physical Demand (P)	Views require user skills. Such as physical speed, motor, and strength	Question 4
Feedback (F)	Views give a vague indication of what the user is doing or has done.	Question 2 and 4





Table or matrices in general application display combinations in sorting and attaching data, in order to discussion of the analysis of problems that arise.

TABLE VI. PT VS PS

PS	PT			
	1	2	3	4
0.5	0.5			
0.3			0.25	
0.6			0.3	
			0.75	0.16
			0.18	

Table VI shows the average general problem of the interface experienced by respondents. The high value of the problem's physical demands indicates that the display requires skill from the user, with a severity value of 4 where this value is also found in all problem types on each task. And other problems arise because of the user rather than the interface itself. However, the problems found are not fatal and can be easily resolved.

TABLE VII. PS VS TN

TN	PS			
	1	2	3	4
			0.16	0.56
				0.18
			0.14	0.32

Table VII shows the average task that has the most problems experienced by respondents. It can be seen that problems generally occur with level 4 in each task scenario, with the highest problem value at TS1. Then with a value of 3 on TS2 and TS3. All problems only reach levels 3 and 4, this shows that the problems found are not fatal and do not hinder users from mastering the interfaces from the Flip app.

TABLE VIII. PT VS TN

TN	PT					
	U	H	T	S	P	F
1	0.38	0.3		0.29		0.39
2	0.18					0.18
3	0.36		0.18			0.13

Table VIII. The following table contains an explanation of which types of problems are most common among all tasks with the average number of problems experienced by respondents. It can be seen that the problem in the task steps that are significant in each task is shown in terms of user knowledge and indications interface to commands for each task. The level of problems is classified as not having serious problems and are easy to overcome.

F. Respondent's Responses

Satisfaction with the Flip application was analyzed through gestures, behavior, and positive and negative

after the assignments were given to respondents [29]. The following are specific questions that will be asked of respondents [30]:

1. How do you feel when you do the task given in relation to the Flip application about at difficulties did you experience when carrying out the assigned tasks related to the Flip application?
2. In your opinion, what needs to be changed or improved regarding the Flip application to make it easier for you to carry out the tasks given?

A summary of respondents' responses to each scenario of the tasks performed can be seen in Table 9. following.

TABLE IX. FEEDBACK RESPOND

Task Scenario	Feedback
TS1	<b>Positive Response:</b> 40%, respondents find it easy to learn the interface and fast in using the Flip application. For new users, the appearance of the Flip application is familiar enough to be used like other e-wallet applications
	<b>Negative Response:</b> 60%, respondents still feel confused in determining the initial stage of inter bank transfers or e-wallet top ups. Respondents felt that icons and text indications were not clear enough and looked ambiguous. There are limits and maintenance to the transaction record
TS2	<b>Positive Response:</b> 89%, respondents stated that the use of the purchase feature did not experience problems because the purchase process on the Flip application used was quite common like other applications with very cheap prices.
	<b>Negative Response:</b> 11 %, respondent given input regarding the selection of the nominal purchase price. Respondents felt that there was too much writing listed, not only focusing on choosing a purchase price.
TS3	<b>Positive Response:</b> 100%, respondent feel happy with the pictures of the steps for using each feature that are presented, the presentation of topics related to problems can be searched without having to always contact customer service. In addition, the customer service chat feature is available 24 hours.
	<b>Negative Response:</b> 100%, there is no negative response from respondents in this task scenario.

Based on the assessment, almost all respondents gave positive and negative responses to assignments, especially at TS1 and TS2. Except for TS3 where all respondents gave 100% positive responses because all respondents could access easily and felt safe or there were no problems and obstacle

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V. CONCLUSION

on level testing usability of the Flip application that has been carried out using the method Cognitive Walkthrough and methods Think Aloud Evaluation. The results obtained are the quality of the Flip application with a percentage value learnability and effectiveness of 92.3% in the very effective category and efficiency value of 0.22 goals/sec in the very fast category. The satisfaction value which can be seen from the positive response of respondents regarding the application. This shows that the Flip application is very good and still needs improvement so that it can be used as a supporting system. Recommendations are given as a feedback in developing and improving applications in order to solve the problems from the test results. Recommendations are interface improvements including appearance, indication, function, and operation, of the Flip application.

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## LAMPIRAN A KUESIONER

*Assalamu'alaikum warahmatullahi wabarakatuh.*

Dengan Hormat,

Saya Fannisha mahasiswa dari jurusan Sistem Informasi fakultas Sains dan Teknologi Universitas Sultan Syarif Kasim Riau. Kuesioner ini disusun dalam rangka penelitian tugas akhir peneliti mengenai evaluasi usability pada aplikasi Flip menggunakan metode Cognitive Walkthrough dan Think Aloud Evaluation.

Peneliti mengharapkan kesediaan dari Bapak/Ibu/Saudara/i untuk menjadi responden dengan melakukan tugas dan menjawab pertanyaan sesuai dengan pengalaman, sehingga nantinya dapat memberi manfaat bagi aplikasi Flip ke depannya.

Setiap informasi yang didapatkan dari kuesioner ini murni dilakukan untuk penelitian Tugas Akhir dan peneliti akan menjamin atas kerahasiaan dari setiap informasi yang diberikan. Terima kasih atas kesediaan Bapak/Ibu/Saudara/i telah mengisi kuesioner ini.

### A. Identitas Responden

1. Nama :
2. Jenis Kelamin :
3. Usia :
4. Kategori Pengguna : Lama/Baru\*

\*coret salah satu

Harap diisi sesuai dengan pengalaman pengguna pada aplikasi Flip

**Tabel B.1.** Kuesioner Skenario Tugas dan Think Aloud

**B.** Skenario Tugas & Think Aloud

Kode	Skenario Tugas	Tahapan	Waktu	Kendala/Tanggapan/Saran
ST1	Transfer Rekening Bank/E-Wallet			
ST2	Pembelian Pulsa/Data/Listrik/Top Up Saldo			
ST3	Pusat Bantuan			

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Task	Action success		Action failure	
Action step				
Will the user try to achieve the right result?	yes <input type="checkbox"/>	from experience	the system tells them to	no <input type="checkbox"/>
Will the user notice that the correct action is available?	yes <input type="checkbox"/>	from experience	they would see a call-to-action	no <input type="checkbox"/>
Will the user associate the correct action with the effect they're trying to achieve?	yes <input type="checkbox"/>	from experience	a prompt/label matches action	no <input type="checkbox"/>
After the action is performed, will the user see that progress is being made toward the goal?	yes <input type="checkbox"/>	from experience	there's a connection between the system response and user goal	no <input type="checkbox"/>

Gambar B.1. Kuesioner Cognitive Walkthrough

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Fannisha, Muhammad Luthfi Hamzah, Eki Saputra, Tengku Khairil Ahsyar

2023 2nd International Conference on Smart Technologies and Systems for Next Generation Computing (ICSTSN)

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in

Second IEEE International Conference on "Smart Technologies and Systems for Next Generation Computing(ICSTSN 2023)" held at IFET College of Engineering on 21<sup>st</sup> and 22<sup>nd</sup> April 2023

  
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Kepada PT Bank Syariah Indonesia, Tbk. to PT Bank Syariah Indonesia, Tbk  
Harap dilakukan transaksi berikut Please do this transaction: Cabang Branch **Kc. SUNDARAN** 1

Jenis transaksi Transaction:  Setoran Deposit  Pemindahbukuan RITS  Kliring Ekspose Clearing Collection  SWIFT  Minal Demand Draft  Lainnya Other

**harap ditulis dengan huruf cetak fill in with block letters**

VALIDASI Validation: AC84 D 1042195118 FANNISIA  
AC04 K US01341300010022 Cabang/lingkup "PT"  
204 R P152710 Fee Atas Transaksi SWIFPM  
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28 MAR 2023 28 MAR 2023 10:48 FTY23087RDKLW 3132951  
IDR 2,283,000.00  
USD 150.00  
TDR 381,500.00

**PENERIMA Beneficiary**  Penduduk  Bukan Penduduk  
Nama  Resident  Non-Resident  
INDIAN OVERSEAS BANK  
Nomor rekening Account Number: 03780200000501  
Bank: HET PAGAR, ENST ROPYD PAD,  
Address & Telephone Number: +91 99991 91007

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Nama  Resident  Non-Resident  Customer  Walk in Customer  
FANNISIA  
Nomor identitas Identity Number: 1471076905000021  
Alamat & Nomor Telepon Address of telephone Number: Jl. GUPURU6 SIAK, KULUH-TEWAYAN  
0821 2660 4152

**MATA UANG Currency**  Rupiah local Currency  Valuta Asing foreign currency

**SUMBER DANA TRANSAKSI Source of Fund**  Tunai Cash  Cek/Slip/giro Cheque

**BIAYA TRANSAKSI Handling Charge**  Tunai Cash  Debet Rekening: Debit Account: 10421951118

**BIAYA Koresponden Correspondent Charge**  Pengirim Applicant  Penerima Beneficiary  Lainnya Others

**Jumlah Transfer Amount of Transfer** **diisi oleh Bank filled out by bank**  
Komisi Commission: 1  
Biaya Pengiriman (SWIFT/RITS/SKIN) 1  
Biaya Koresponden Correspondent Charge: 76 MAR 2023  
Sub Total: 10421951118  
Kurs Rate: 150  
Total: 150 USD

**BERITA UNTUK PENERIMA Message for Beneficiary**  
SWIFT CODE : 106A0000378 (106A1V88070)

**TUJUAN TRANSAKSI Underlying Transaction**  
Pembayaran KIR FANNISIA  
MAREK 10 155511CS TSP-112

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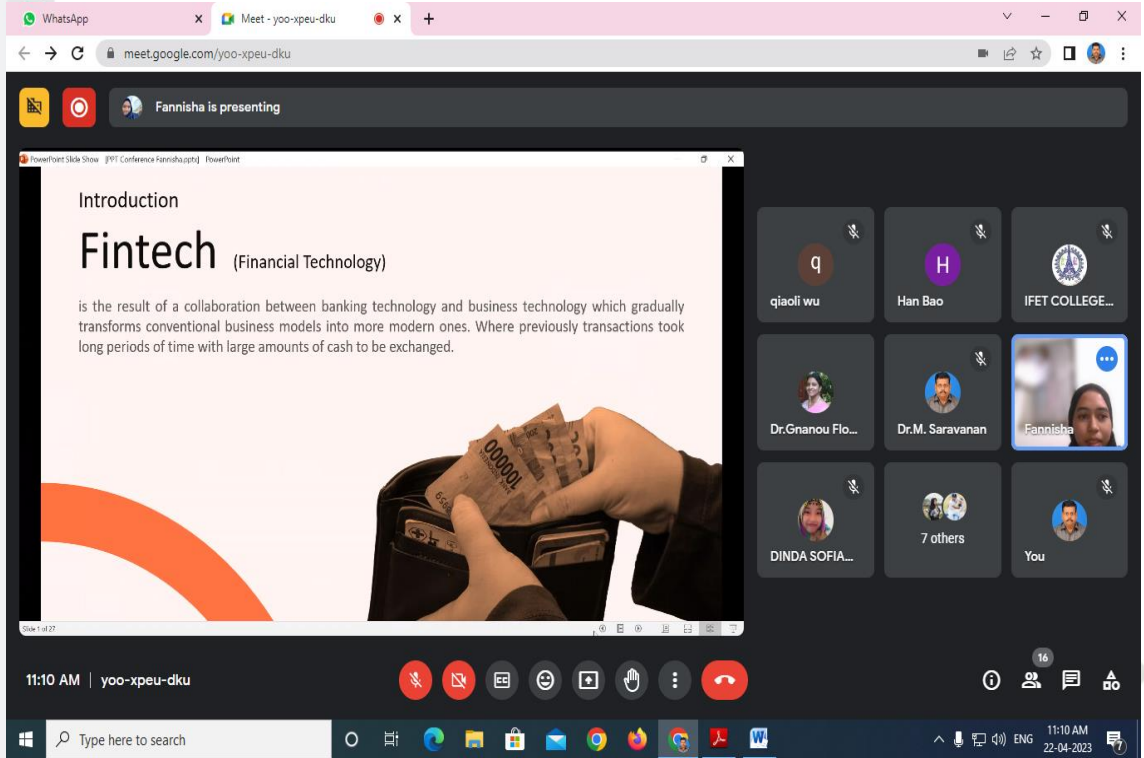
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**Session Chairs** : 1. Dr.Gnanou Florence Sudha, Professor/ECE,  
Pondicherry Technological University, Puducherry  
2. Dr.M.Saravanan, Professor, ECE, IFETCE, Villupuram

**Date and Time** : 22/04/2023 (Saturday-FN), 10 AM to 12.00 PM

**Track 7** : Wireless communication (Online)

**Meeting ID** : meet.google.com/yoo-xpeu-dku

S.NO	Paper ID	Paper Details
1	ICSTSN 65 (10.00-10.15 AM)	Design and Analysis of Microstrip Yagi Uda Antenna for 5G Communications on FR4 Substrate <i>Pavidha. V, A. Jayakumar</i>
2	ICSTSN 220 (10.15 -10.30 AM)	Joint User Cooperation and Scheduling for Federated Learning in CFmMIMO Networks <i>Ke Xiong, Han Bao, Bo Gao, Pingyi Fan</i>
3	ICSTSN 196 (10.30-10.45 AM)	Adaptive Sensor Scheduling for Federated Learning over 6G In-X Subnetworks <i>Bo Gao, Qiaoli Wu, Ke Xiong</i>
4	ICSTSN 112 (10.45-11.00 AM)	Usability Evaluation of Flip Application using Cognitive Walkthrough and Think Aloud Evaluation Methods <i>Fannisha, Muhammad Luthfi Hamzah, Eki Saputra, Tengku Khairil Ahsyar</i>
5	ICSTSN 224 (11.00-11.15 AM)	DQ-WiAPDoM: A DQN-based AP Deployment Optimization Method for Wi-Fi FTM Positioning <i>Zihao Liu, Han Li, Bo Gao, Ke Xiong, Pingyi Fan</i>
6	ICSTSN 326 (11.15-11.30 AM)	Modeling and Comparative Analysis of Microwave Circulators with Variation of Material Properties <i>Anuj Kumar Goel, Sarbjit Singh</i>
7	ICSTSN 17 (11.30-11.45 AM)	Modeling of Green Communication Based VLLC System <i>Meet Kumari</i>



## DAFTAR RIWAYAT HIDUP

Peneliti Tugas Akhir ini bernama Fannisha. Lahir di Padang pada tanggal 29 Mei 2000. Merupakan anak pertama dari tiga bersaudara pasangan Ayahanda Hendrizof Halim dan Ibunda Nurbariani. Peneliti bertempat tinggal di Pekanbaru, Riau. Memulai pendidikan Sekolah Dasar pada tahun 2005-2011 di SDIT Cendekia dan SDIT Al-Fityah. Pada Tahun 2011 melanjutkan pendidikan Sekolah Menengah Pertama (SMP) dan Sekolah Madrasah Aliyah (MA) mengambil jurusan agama di Al-Ihsan Boarding School, lulus pada tahun 2018. Pada tahun 2018 mulai bekerja di berbagai bidang pekerjaan mulai dari karyawan toko hingga kepanitiaan turnamen futsal. Pada tahun 2019 peneliti melanjutkan pendidikan Strata 1 (S1) dan diterima sebagai mahasiswa di Program Studi Sistem Informasi Fakultas Sains dan Teknologi Universitas Islam Sultan Syarif Kasim Riau. Selama masa perkuliahan peneliti aktif mengikuti berbagai kegiatan kampus, telah melaksanakan Kerja Praktek (KP) di MA Al-Ihsan Boarding School serta mengikuti Kuliah Kerja Nyata (KKN) pada tahun 2022 di Desa Teluk Batil, Kecamatan Sungai Apit, Kabupaten Siak. Selanjutnya peneliti menyelesaikan penelitian Tugas Akhir dengan topik Evaluasi Sistem dan mengambil studi kasus pada Aplikasi Play Store Dompot Digital Flip dalam bentuk paper yang diterbitkan di IEEE.

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