ICST 2018

RISTEKDIKTI
Ministry of Research, Technology and Higher Education
Republic of Indonesia

Universitas Riau

29 - 30 October 2018

The 3rd International Conference on Science and Technology

Program and Abstract

Institute of Research and Community Services

Meneliti, Berkarya dan Mengabdi

PREFACE

The 3rd International Conference on Science and Technology (ICST 2018) is a continuation of the two previous conferences in 2016 and 2017. The conference held on 29-30 October 2018 in Pekanbaru-Indonesia is intended to be a forum used by researchers to disseminate their ideas and research findings in science and technology. The theme of the ICST 2018 is "Collaborating to Develop Our Country". This theme has meaning that collaboration among field of researches is needed to rise and find ideas and technology in order to develop the nation and the country.

Each paper submitted to this conference is reviewed by Program Committee. The papers with the highest quality are accepted for oral presentation and publication in the conference proceedings. Further, the selected papers will be published in the index journals.

On behalf of this conference committee, we would like to express our highest appreciation to Rector of Universitas Riau and Director of Institute of Research and Community Services (LPPM) Universitas Riau for the full support. Our special thanks go to the Steering Committee and Program Committee members that come from Australia, India, New Zealand, Malaysia, China, UAE, United States of America, Italy, South Africa, Chile, Brazil, Pakistan, Saudi Arabia, Nigeria, Kuwait, Brunei Darussalam and Indonesia for their valuable efforts in the review process that help us to guarantee the quality of selected papers for the conference.

We also would like to express our thanks to the keynote speakers, Prof Dr Jemal H. Abawajy from Deakin University Australia, Prof Dr Lilia Halim from National University of Malaysia, Prof Dr Andrew S. Ball from RMIT University, Australia and Prof Dr Richardus Eko Indrajit from Perbanas Institute, Indonesia.

Finally, we cordially thank all the authors for their valuable contributions and other participants of this conference.

Thank you.

Conference General Chair

Dr. Elfizar

Program

MONDAY (October 29, 2018) - DAY 1

07.30 – 08.30	The 3rd Int'l Conference on Science and Technology Registration Mutiara Merdeka Hotel (2nd floor)
08.30 – 08.45	National Anthem of Indonesia - Indonesia Raya
08.45 – 09.00	Welcoming Speech by ICST 2018 Committee Dr Elfizar
09.00 – 09.20	Opening Speech by Rector of University of Riau Dr. Ir. Agus Indarjo, M.Phil
09.20 – 10.00	Refreshment
10.00 – 12.30	Keynote Speeches Prof Dr Jemal H. Abawajy (Deakin University, Australia) Prof Dr Lilia Halim (National University of Malaysia, Malaysia) Prof Dr Andrew S. Ball (RMIT University, Australia) Prof Dr Richardus Eko Indrajit (Perbanas Institute, Indonesia)
12.30 – 13.30	Break and Lunch Mutiara Merdeka Hotel
13.30 – 17.30	Parallel Session I Room A
13.30 – 17.30	Parallel Session II Room B
13.30 – 17.30	Parallel Session III Room C
13.30 – 17.45	Parallel Session IV Room D
13.30 – 17.30	Parallel Session V Room E
17.30 – 18.00	Closing and Best Papers Announcement

TUESDAY (October 30, 2018) – DAY 2 (Post Seminar, Tour – optional)

08.30 –	Pick up the group from the lobby
10.00 –	Arrive at the tour location
12.30 –	Refreshment and lunch
14.00 –	Leave to Pekanbaru
16.30 –	Arrive at Mutiara Merdeka Hotel

Parallel Session I
Room : A
Time : 13.30 – 17.30
Chair : Nery Sofiyanti

Time	Title & Authors
13.30 – 13.45	Diversity of Soil Macrofauna and Mesofauna in The Peatland That Overgrown and Unovergrown by Difference Age of *Mucuna* *Wawan, Hapsoh, Andri Imam Mashuri, Angga Prayuga*
13.45 – 14.00	Photo-oxidation Stability of Patin (*Pangasius hypopthalmus*) and Red Palm Mixed Oil *Dewi Fortuna Ayu, Ariyano Pinem, Akhyar Ali, and Andarini Diharmi*
14.00 – 14.15	Marketing Efficiency of Aloe Vera Leaf and Efficiency of Nata De Aloe Beverage Processing in Pekanbaru City *Yeni Kusumawaty, Evy Maharani, Susy Edwina, Tengku Harunur Rasyid*
14.15 – 14.30	Isolation of Antimicrobial Secondary Metabolites from Fungi *Penicillium* Sp. LBKURCC34 *Annisa Fitri*
14.30 – 14.45	MICROSOP (Microalgae Sorbent for POME) From *Chlorella* sp. which is Immobilized with Alginat Calcium *Fucy Adilla Hasti, Indah Darmayanti, Desy Christina, Shinta Elystia*
14.45 – 15.00	Analysis of Macrozoobentic Community Response to Heavy Metal Contamination in Coastal Sediment of Kundur Island *Bintal Amin, Irvina Nurrachmi, Nanda Alitua Pasaribu, Sihol CH Siringoringo*
15.00 – 15.15	Diversity and Distribution of Rattan Jernang (Arecaceae) in Bukit Duabelas National Park, Indonesia *Revis Asra, Holger Kreft, Joko Ridho Witono*
15.15 – 15.30	Hydroponic, An Effort to Improve Agriculture in Urban Areas *Yulia Andriani, Roza Yulida, Rosnita*
15.30 – 15.45	The Order Polypodiales (Pteridophyte) From Coastal Area of Riau Province, Indonesia *Nery Sofiyanti, Mayta Novaliza Isda*
15.45 – 16.00	Utilization of Biochar and Biofertilizer to Improve Water Holding Capasity and Availability of Phosphorus in Ultisol Land with Soybean Indicators *Sidik Yunedi, Andrian Perdana, Eka Lupitasari, Wawan*
16.00 – 16.15	Bioprocess Engineering of Microalgae (*Chlorella sp*) For Enhancing Lipid as Lip Balm Basic Material Formula *Sri Indira Puspa Pertiwi, Herta Furaida Erlangga, Andhika Chandra, Shinta Elystia*
16.15 – 16.30	Microbial-Cellulose Production from Sagu Liquid Waste Using Dip Fermentor *Fajar Restuhadi, Yelmira Zalfiatri, Dewi Fortuna Ayu, Topan Indra Pati*

Parallel Session II
Room : B
Time : 13.30 – 17.30
Chair : Yohannes Firzal

Time	Title & Authors
13.30 – 13.45	Acceleration of Rural Economic Development through the Development of Plantations Superior Commodities in the Coastal Areas of the Province of Riau *Almasdi Syahza, Djaimi Bakce, Mitri Irianti, Brilliant Asmit*
13.45 – 14.00	Wood Plastic Composite (WPC) Applications as a Replacement Material in Traditional Buildings in Sinaboi *Indra Kuswoyo, Muhammad Arief Al Husaini*
14.00 – 14.15	Analysis of Consumer Attitudes to Consume Beverages of Del Monte Import Products in Pasar Bawah Kota Pekanbaru *Raka Prasetyo, Novia Dewi, Ermi Tety*
14.15 – 14.30	The Effect of Audit Opinion, KAP Size, and Management Shift Towards Auditor Switching (The Study at LQ45 Company Which is Listed at Indonesia Stock Exchange) *Andreas, Enni Savitri*
14.30 – 14.45	Marketing and Rubber Price Transmission in Kampar Subdistrict of Kampar District *Eliza, Novia Dewi, Shorea Khaswarina*
14.45 – 15.00	Competitiveness Analysis of Indonesian Processed and Non-Processed Agricultural Commodities in The Asean Region *Ermy Teti, Suardi Tarumun, Deby Kurnia*
15.00 – 15.15	Application of Local Wisdom on Sago Farming in Meranti Island Regency of Riau Province Indonesia *Eri Sayamar, Yulia Andriani, Novian, Roza Yulida, Rosnita*
15.15 – 15.30	Characteristic of Old Shop Houses Façade in Selatpanjang City as Character of Waterfront City *Pedia Aldy, Wahyu Hidayat*
15.30 – 15.45	Comprehensive Analysis of Change Management in the Public Sector *Abdulaziz Aljunaibi*
15.45 – 16.00	Integration and Financial Tools Application of SME Business Decisions (APIK KU Application) *Johny Budiman, Wisnu Yuwono, Agung Riyadi, Syaeful Anas Aklani, Renza Fahlevi*
16.00 – 16.15	Preserving Traditional Malay Kampong as Heritage Landscape: Case Study of Koto Sentajo Kuantan Singingi *Yohannes Firzal, Gun Faisal, Indra Kuswoyo*
16.15 – 16.30	Addition of Red Ginger Extract in Making Breadfruit Leaf Powder Instant Drink *Raju Dede Sumarlin, Dewi Furtuna Ayu, Rahmayuni*
16.30 – 16.45	Effect of Different Raw Material Handlings Toward Fat Content And Fatty Acid Profile of Eel Tailed Catfish (*Paraplotosus albilabris*) Flour *Dian Iriani, Sumarto, Jansen Tumpubolon*

Parallel Session III

Room : C
Time : 13.30 – 17.30
Chair : Ardiansyah

Time	Title & Authors
13.30 – 13.45	Analysis of Learning Difficulties on the Topic of Ion Equilibrium and pH of Buffer Solution Based on Attribute Hierarchy Method *R.Usman Rery, Wimbi Apriwanda, Herdini, Masnaini Alimin*
13.45 – 14.00	Improving Pedagogic Competency of Chemical Teachers in SMAN 2 Bangkinang Kota Using The Application of Lesson Study As Learning Community (LSLC) *Addinul Adli, Maria Erna, Rasmiwetti*
14.00 – 14.15	The Development of Diagnostic Instrument of Ordered Multiple Choice (OMC) Type Using Attribute Hierarchy Method (AHM) Model on The Topic of Thermochemistry *Siti Nazhifah, Jimmi Copriady, Roza Linda*
14.15 – 14.30	Development of Student Worksheets (SW) Based on Constructivism in Carboxylic Acid Materials and the Derivative *Rendra, Jimmi Copriady, Maria Erna, Susilawati*
14.30 – 14.45	The Development of Students Worksheets Based On Guided Inquiry on the Topic of Materials Buffer in High School *R. Okta Rise Armis, Asmadi M Noer, Rasmiwetti*
14.45 – 15.00	Chemistry Teacher's Misconception on Atomic Structure and Periodic System: The Application of Three-Level Multiple Choice *Jimmi Copriady, R. Usman Rery, Masnaini Alimin, Sri Wilda Albeta*
15.00 – 15.15	Developing Student worksheet Based on Discovery Learning on the Topic of Buffer Characterized by Critical Thinking Content *Deta Marlia Rahmadeni, Asmadi M. Noer, Maria Erna*
15.15 – 15.30	Development of Difficulty Test Instrument for Ordered Multiple Choice (OMC) In Acid-Base Materials *Rizqiani Abfidah, Susilawati, Rasmiwetti*
15.30 – 15.45	Developing Chemical Equilibrium Learning Module Through Lesson Study *Ellya Adnan, Maria Erna, Roza Linda*
15.45 – 16.00	Development of Assessment Instruments to Diagnose the Ability of Students' Critical Thinking in Equilibrium Subject *Vicky Wahyudi, Maria Erna, Roza Linda*
16.00 – 16.15	The Development of E-Module Based on Problem Based Learning For the Main Topic of Electrolyte and Non-Electrolyte Solvent *Jumrotus Sholeha, Jimmi Copriady, Rasmiwetti*
16.15 – 16.30	The Development of Students'Activity Sheet in Discovery Based Learning for Solubility Equilibrium Material Characterized by Creative Thinking Content *Khairunnisa, Asmadi M. Noer, Maria Erna*
16.30 – 16.45	Development of Student WorkSheets (SWS) Based on Constructivism in Amine Materials *Nurul Auliya Nisa, Susilawati, Jimmi Copriady*
16.45 – 17.00	Developing Learning Media Based on Lectora Inspire on Chemical Equilibrium *Nurhafni, Maria Erna, Susilawati*

Time	Title & Authors
17.00 – 17.15	The Comparison of Students' Misconception on Acid Base Topic after General Chemistry II Course and Chemistry School II Course at Chemical Education of University of Riau *Abdullah, Rini, Ardiansyah*
17.15 – 17.30	The Development of Chemistry Equilibrium Student Worksheets Based on Guided Inquiry through the Lesson Study Approach *Fajar Aidilsyah, Maria Erna, Roza Linda*

Parallel Session IV
Room : D
Time : 13.30 – 17.45
Chair : Sri Gemawati

Time	Title & Authors
13.30 – 13.45	Implementation Logic Scoring of Preference Method for Determining Landfill with Geographic Information System *Dovel Pirmanto, Jatmiko Endro Suseno, Kusworo Adi*
13.45 – 14.00	Implementation of Circular Hough Transformation (CHT) Algorithm To Detect Circles with the Central Method on an Image *Zaiful Bahri, Sukamto*
14.00 – 14.15	The Use of Information and Communication Technology for Palm Oil Farmers in Pelalawan District of Riau Province *Roza Yulida, Rosnita, Yulia Andriani, Eri Sayamar*
14.15 – 14.30	The Development of Early Warning System for Detecting Flood Disaster in Part of Bandar Lampung City *Nirmawana Simarmata, Ayudia Hardiyani Kiranaratri, Denny Hidayat Tri Nugroho*
14.30 – 14.45	A Three-Step Iterative Method To Solve A Nonlinear Equation Via An Undetermined Coefficient Method *Nora Fitriyani, M Imran, Syamsudhuha*
14.45 – 15.00	Decision Support System for Supervisor Selection Based on Competency *Elvira Asril, Fana Wiza*
15.00 – 15.15	Computer Adaptive Test Implementation to Improve The Efficiency of Student Admission in Universities *Maksum Ro'is Adin Saf, Dini Hidayatul Qudsi*
15.15 – 15.30	Determination of Total Calorie Pregnant Women Using Fuzzy Inference System (FIS) Mamdani" *Tri Monarita Johan*
15.30 – 15.45	Effectiveness and Efficiency of Using Tree Sampling Methods on Estimating Eucalyptus Stand Potential (*Eucalyptus Pellita* F. Meull) *Muhammad Ikhwan, Emy Sadjati, Ambar Tri R. N.*
15.45 – 16.00	A Derivative Free Three-step Iterative Method to Solve A Nonlinear Equation *Nurul Khoiromi, M Imran, Syamsudhuha*
16.00 – 16.15	The Effect of MYOB Test Clinic Toward Student Competence *Suharyono, Husni Mubarak*
16.15 – 16.30	The Generalized Pascal Matrix via The Generalized Tribonacci Matrix *Sri Gemawati, Mirfaturiqa*
16.30 – 16.45	Applying PROMETHEE Method on Decision Support System to Determine University Majors Based on Android *Gita Sastria, Tomi Firman Cahyadi, Alfirman*
16.45 – 17.00	Handling Concept Drift in Online Machine Learning: A Literature Review *Ibnu Daqiqil Id, Zainal Arifin Hasibuan*
17.00 – 17.15	Development of Malay Traditional Dances and Songs Application *Elfizar, Sukamto, Aidil Fitriansyah*
17.15 – 17.30	Community Partnership Program: Developing Multimedia as a Learning Media for Elementary School Teachers *Refika Andriani, Destina Kasriyati, Sutjeo*

Time	Title & Authors
17.30 – 17.45	Information System of House Building Costs and Analysis of Materials and Salary at PT. Graha Riau *Fatayat*

Parallel Session V
Room : E
Time : 13.30 – 17.30
Chair : Fitmawati

Time	Title & Authors
13.30 – 13.45	Effects Precursor on Morphology and Catalytic Properties of the *Birnessite*-Type Octahedral Layered Manganese Oxide Catalysts using Reflux Method for Degradation of Methylene Blue *Amelia Pertiwi, M. Azanil Putra, Siti Saidah Siregar, Amir Awaluddin, Nurhayati*
13.45 – 14.00	Electrochemical Exfoliation of Graphite Using Sulfuric Acid for Graphene Synthesis: Disintegration Rate and Raman Spectroscopy *Amun Amri, Azhari Harahap, Syelvia Putri Utami*
14.00 – 14.15	The Effect of Blending Time to Characteristic and Performance of Rubber Seeds (*Havea Brasiliensis*) Biocoagulant for Peat Water Treatment *Ridha Ridya Wanie, Amilia Linggawati*
14.15 – 14.30	Calination Effect Of Octahedral Layered Birnessite-type Manganese Oxide (OL-1) Nanostructures with Tremendous Catalytic Activity for Methylene Blue Degradation *Muhammad Azanil Putra, Amelia Pertiwi, Amir Awaluddin, Nurhayati, Siti Saidah Siregar*
14.30 – 14.45	Antimicrobial Activity of Growth Media of Local Isolate *Penicillium* sp. LBKURCC29 *Nuryani Nenci, Yuharmen, Yuana Nurulita*
14.45 – 15.00	Antimicrobial Activity of Secondary Metabolites from Liquid Fermentation Medium of *Penicillium* sp. LBKURCC34 stimulated by *Staphilococcus aureus* *Khairullinas, Citra Hardiyanti, Ayu Putri Anugrah, Yuana Nurulita*
15.00 – 15.15	Antioxidant Activity of Wild Mango (*Mangifera*) from Sumatra *Fitmawati, Erwina Juliantari, Rodesia Mustika Roza, Mayta Novaliza Isda*
15.15 – 15.30	Analysis of Peat Soil Microbial Community Function in Bukit Batu, Riau Province: Community-level Physiological Profiling (CLPP) Application *Abbrar Yusra, Nelvia, Nova Wahyu Pratiwi, Delita Zul*
15.30 – 15.45	Efficiency of Removal Heavy Metal Chromium (VI) From Electroplating Effluent Using *Anabaena Cycadae* Immobilized in an Aerator Tube Based Biosorption *Ferdy Ashari Syawal, Ayu Eka Putri, May Kristina, Shinta Elystia*

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ABSTRACT

Integration and Financial Tools Application of SME Business Decisions (APIK KU Application)

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Abstract

This study aims to design an accounting and financial application that can help Micro, Small and Medium Enterprises (SMEs) actors in carrying out financial recording and reporting as well as financial information with good accounting standards and the use of financial tools in the Accounting and financial applications, financial information, business decision making, SMEs, SDLC business. This research method is making a draft application for recording financial information, in the form of a System Development Life Cycle (SDLC) designed to help SME owners obtain financial information to make decisions in the SME business efficiently and effectively.

Keywords: Accounting and financial applications, financial information, business decision making, SMEs, SDLC.

Competitiveness Analysis of Indonesian Processed and Non-Processed Agricultural Commodities in the ASEAN Region

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Abstract

The commitment of the ASEAN Economic Community opens up opportunities for member countries including Indonesia to improve the trade balance, especially in processed and non-processed agricultural products. These opportunities should be followed by increasing the competitiveness of each country. The purpose of this study was to analyze the development of exports of processed and non-processed Indonesian agricultural products in the ASEAN region and the competitiveness of exports agricultural products in ASEAN countries to the main destination countries. ISP analysis is used to determine the development of exports, while the Constant Market Share (CMS) and Revealed Comparative Advantage (RCA) approaches are used to analyze the competitiveness and competitive advantages of each ASEAN member country. The results showed that Indonesia was in the top position for the export of agricultural processed products in 2009 with an ISP reaching 0.87. Whereas for non-processed agricultural products led by Thailand with ISP reached 0.89. Increased competitiveness of processed and non-processed products is more influenced by increased demand in export destination countries. The RCA index of non-processed agricultural products in Thailand reached the peak in 2014 at 3.2 position, while Indonesia had the highest RCA index in agricultural processed products which reached 8.80. This shows that Indonesia has comparative advantages in agricultural processed products compared to other countries in ASEAN.

Keywords: competitiveness, agricultural products, comparative.

Integration and Financial Tools Application of SME Business Decisions (APIK KU Application)

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Abstract: This study aims to design an accounting and financial application that can help Micro, Small and Medium Enterprises (SMEs) actors in carrying out financial recording and reporting as well as financial information with good accounting standards and the use of financial tools in the Accounting and financial applications, financial information, business decision making, SMEs, SDLC business. This research method is making a draft application for recording financial information, in the form of a System Development Life Cycle (SDLC) designed to help SME owners obtain financial information to make decisions in the SME business efficiently and effectively.

Keywords: Accounting and financial applications, financial information, business decision making, SMEs, SDLC.

1. Introduction

Micro, Small and Medium Enterprises (SME) are one of the drivers for the economy in Indonesia. SME businesses have proven themselves as one of the most resilient businesses in the face of the monetary crisis in 1998, when many large businesses went bankrupt due to the crisis; SMEs still existed and sustained the Indonesian economy. Recorded, 96% of SME in Indonesia still survive the crisis. The same thing happened in 2008-2009 [11].

Based on data released by Indonesia Central Bureau of Statistics, SMEs are proven to be able to survive and thrive after the crisis hit in 1998 and 2008. The data below presents the development of SMEs in Indonesia after the economic crisis in 1998 and 2008.

In its development, SME is not without problems and obstacles that accompany it. Lestiawan and Mahmud (2014) stated that in general there are four main problems of SME, namely access to capital, generally SME owners are not bankable, SME financial management has not been neatly arranged between costs and revenues, access to marketing because network limitations have caused SME not fully accessing markets and SME does not tend to focus on one main business [6].

Based on Table 1, it is clearly explained that one of the fundamental problems in the growth and development of SME is closely related to the limitations of SME in managing corporate finances. This is because not all SME has good financial reporting. Whereas Ediraras (2010) stated that several roles and functions of financial statements are as an assessment of business performance and performance evaluation materials for the future, as consideration for business decisions and company operations and as an initial requirement to apply for financing to banks [3].

Meiliana and Dewi (2015) said that in a company, recording and reporting is needed to assess the firm's performance [9]. According to Suryo (2008) in Hariyadi (2014), in addition to capital and market

access that can make it difficult for Micro, Small and Medium Enterprises (SME) to grow, many SME cannot afford to become large because they do not have systematic bookkeeping, as a result there is no strict separation between personal money and company money [4].

Table 1. SMEGrowth in Indonesia, 1998 – 2000 and 2008 - 2010

Indicators	Quantity	1998	1999	2000	2008	2009	2010
Total of SMEs	Unit	36,813,578.0	37,911,723.0	39,784,036.0	51,409,612.0	52,764,603.0	53,823,732.0
Amount of SMEs Growth	Percentage	-7.42	3.0	4.9	2.5	2.6	2.0
Total of SMEs Employees	Person	64,313,573.0	67,169,844.0	72,704,416.0	94,024,278.0	96,211,332.0	99,401,775.0
Growth of SMEs Employees	Percentage	-1.96	4.4	8.2	3.9	2.3	3.3
Constant GDP contribution of SMEs	IDR Billions	552,945.4	647,475.0	760,089.0	1,165,753.2	1,212,599.3	1,282,572.0
Growth GDP Contribution of SMEs	Percentage	52.2	17.1	17.4	6.0	4.0	5.8
SMEs Export Value	IDR Billions	69,315.4	52,594.1	75,448.6	178,008.3	162,254.5	175,894.9
SMEs Export Value Growth	Percentage	76.5	-24.12	43.5	26.8	-8.85	8.4

Source : Indonesia Central Bureau of Statistics

Ediraras (2010) said that one way to have and analyze financial reporting on SME is to recruit financial experts, but of course this will add new problems for SME that are not yet financially well established. Therefore, the need for a mobile application that can facilitate SME owners in preparing transactions that occur in their business and summarizing them into a financial report and can then be analyzed for business decision making for SME companies in Indonesia is required [3].

Some financial applications have been created to help companies prepare their financial statements. But previous applications have not been able to meet all the needs of SMEs. From some limitations of existing applications, this design will make financial applications that have additional advantages such as applications that can run on Android-based smartphones, store data in form of excel and pdf format, send external data to other devices, upload and download data so that consumers are easy to obtain data under any conditions and provide recommendations for users to make business decisions.

2. Literature Review

2.1. Perceived Usefulness

Bashir and Madhavaiah (2015) define perceived usefulness as the degree to which application users believe that using the application will improve the firm's performance [1]. Previous researchers revealed that consumers would be willing to use the latest technology if the technology was able to help consumers facilitate their activities [7,8,14].

APIK KU application design aims to answer the needs of SME owners in the preparation of easier, more precise and systematic financial statements. The results of this design do not only make it easy for SME owners in preparing financial statements, but also make it easier for others such as banking (decisions in determining loans) and investors (in determining investment decisions).

2.2. Perceived ease of use

Davis (1989) in Nguyen (2016) states that although an application provides benefits to consumers (perceived usefulness), but not necessarily consumers will use the application if the application is difficult to use/learn (perceived ease of use) [10]. Mazhar (2014) revealed that a new technology must be easy to operate [8]. If an application is easy to use/operate, it is more likely that the application will be adopted by consumers [12,13,14].

2.3. Perceived risk

Yan (2016) explained that the use of new technology can pose risks, especially when consumers must provide confidential data into the application [13]. Perceived risk is a criterion that is often used to analyze consumer behavior. Perceived risk consists of financial risk, functional risk, time risk,

psychological risk and social risk. Consumers have concerns about losing money if they use new technology [7]. Bashir and Madhavaiah (2015) define perceived risk as an uncertainty that application users will experience financial loss, performance, social or privacy when adopting an application [1].

Perceived risk has a significant negative effect on consumers' intention to use the application, meaning that the higher the risk arising from the use of the application, the lower the likelihood that the application will be used by consumers [5,7,13].

In designing financial applications, APIK KU uses the SDLC method. SDLC concept is the development of a system cycle in application design, which includes planning, analysis, design, implementation and maintenance, making it easier for future system development. This system life cycle aims the application system to minimize the possibility of incorrect input made by consumers when entering data transaction in the financial application. In addition, the application has entered the SDLC method, so that data processing process becomes information faster and consumers can immediately make a decision.

2.4. Social Influence

Social influence in this study is defined as the influence given by the community, family and other people to users (SME owners) to use or not use APIK KU applications in their companies. Thakur (2013) states that an individual will use a technology as a result of other individual influences [13]. Social influence has a significant positive effect on consumers' intention to use financial applications. This proves that the greater the influence given by the community / relatives it will increase the possibility of consumers to use an application [1,7].

APIK KU application has considered and implemented all the inputs and suggestions for the early stages of several investor communities as well as from the banking team. This is to ensure that in the future APIK KU financial applications can be used as the main reference for SMEs who want to get loan facilities from banks and investors. Of course, if the output produced by the APIK KU application is in accordance with the standard banking standards, then the banking will easily recommend this application to SME owners who have not received access to loans to banks.

3. Material & Methodology

In the APIK KU financial application review there are several phases of the creation of this application. The flow starts from the requirement analysis of problems and constraints faced by SME owners in preparing financial statements. The next step is to design an interface design that suits the needs of SMEs. In the next step is the design of a database that is useful for storing transactions entered by the user into the APIK KU application. API-Endpoints design, then application and API interconnection and end with application testing to several SME owners. The results of entering the SME performer will be used as reference material for improving the APIK KU application.

Learning the system is needed. By focusing on system flow and software usage. Problem recognition is done by determining the problems that will be faced. At this stage it is determined who will use the application, the properties of the user and what the user expects.

4. Results and Discussion

4.1. Application Design

Application design section contains use case diagrams, use case scenarios, sequence diagrams, ER diagrams, and data concept models. Figure 1 and Figure 2 are an application flowchart and use case diagram of the application, respectively.

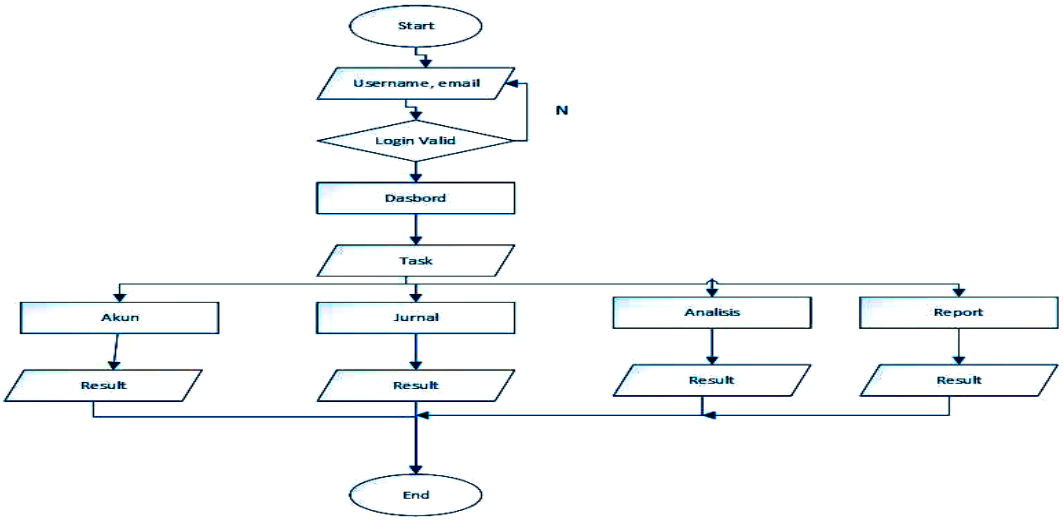

Figure 1. Application flowchart

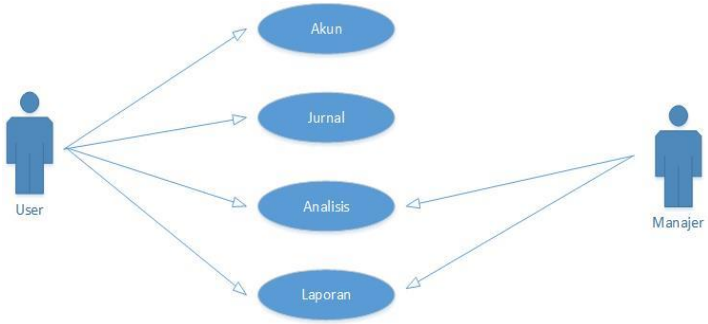

Figure 2. Use Case Diagram

The following is a sequence diagram that describes the behavior of a job starting from the input or event to produce a particular output.

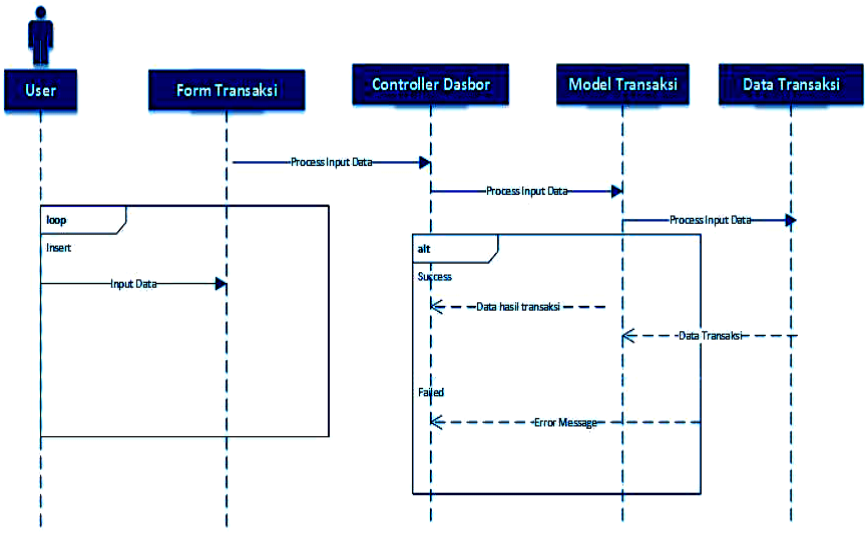

Figure 3. Transaction sequence diagram

In the transaction sequence diagram contains the android application transaction connected to the Server API, if an error occurs it will send an error message to android (Figure 3).

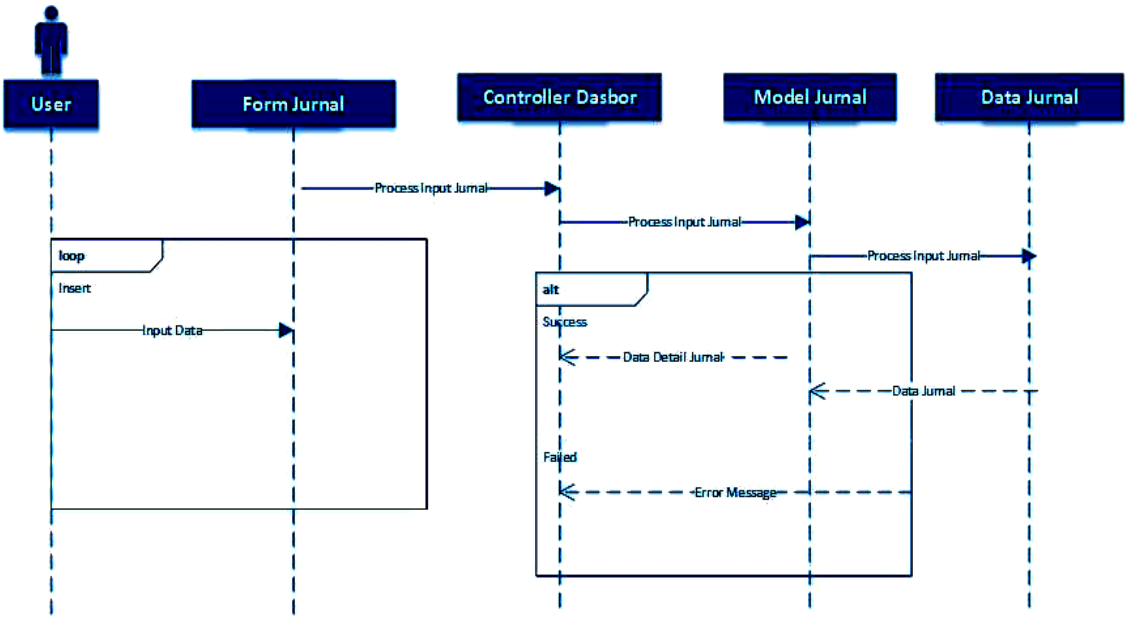

Figure 4. Journal sequence diagram

Journal diagram sequence contains the journaling process in an android system that is connected to the server to analyze journals that are on android (Figure 4). In the Figure 5, the Analyze sequence diagram contains journal process in an android system that is connected to the server to display financial report in the android system.

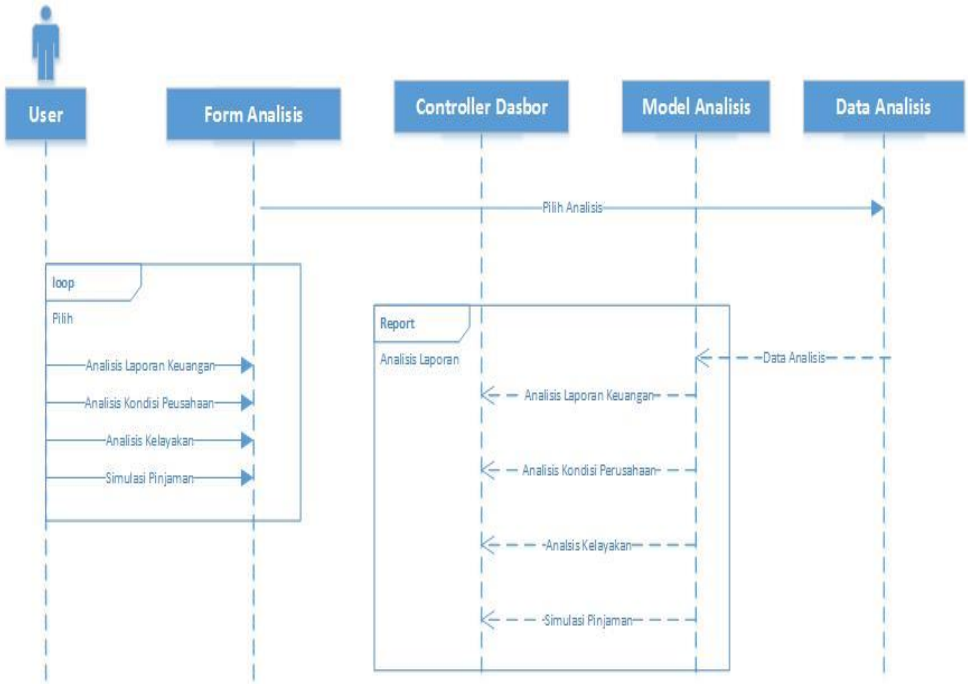

Figure 5. Analysis Sequence Diagram

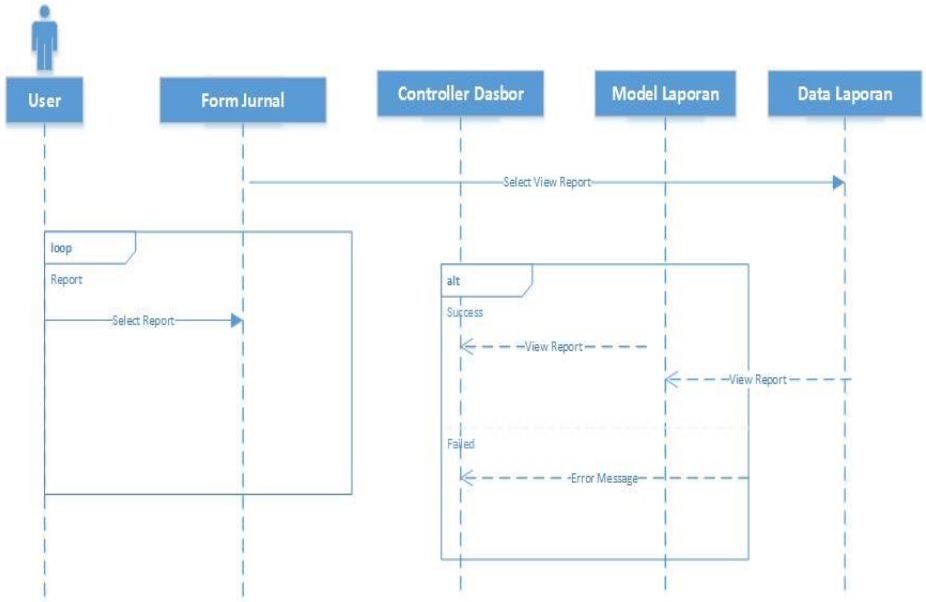

Figure 6. Report sequence diagram

In Figure 6, Report sequence diagram contains the journal process in an Android system that is connected to the server to display reports on Android.

4.2. Designing of API-endpoints

API design

In a computer programming, API (Application Programming Interface) is a definition of a subroutine, or protocol as a tool for building software. A well-made API can make programmers easier to develop software that is more structured and dynamic.

API is usually made for Android-based applications where accessing the database using fire-endpoints cannot directly use connection strings, to make it faster and safer. In this study, researchers developed API-Endpoints to make a transaction between android and database servers. With the following concepts:

API -->
-->login/{email}/token [post/get]
-->jenistransaksi [get]
-->pilihjenis/box1/{id} [get]
-->pilihjenis/box2/{id} [get]
-->newtransaction/{data} [post]
-->transaksi/{id} [get]
-->laporan/jurnal/{data} [get]
-->laporan/bukubesar/{data} [get]
-->laporan/neraca/{data} [get]
-->laporan/labarugi/{data} [get]
-->laporan/analisiskeuangan/{data} [get]
-->laporan/analisiskondisi/{data} [get]
-->laporan/analisiskelayakan/{data} [get]
-->laporan/tempatusaha/{data} [get]

Calling the Transaction Type List

The transaction list is used to fill in the option box, the type of transaction when making a new transaction. Method: **GET**http://159.89.109.117/api/jenistransaksi/

JSON-data:
id : (id type of transtraction)
name : name of transtraction
Return:
{"status":"success","data":[{"id":"1","nama":"Pemasukan"},{"id":"2","nama":"Pengeluaran"},{"id":"3","nama":"Hutang"},{"id":"4","nama":"Bayar Hutang"},{"id":"5","nama":"Piutang"},{"id":"6","nama":"Dibayar Piutang"},{"id":"7","nama":"Tambah Modal"},{"id":"8","nama":"Tarik Modal"},{"id":"9","nama":"Pengalihan Modal"},{"id":"10","nama":"Penyesuaian"}]}
To choose only one type:
http://159.89.109.117/api/jenistransaksi/**{idjenistransaksi}**
Contoh: http://159.89.109.117/api/jenistransaksi/5
Return:
{"status":"success","data":[{"id":"5","nama":"Piutang"}]}

Calling of asset type

Used to fill in the box that will be filled in by filling in the assets, and for assets. To answer in the first option box using the following url:

Method: GET (box option 1)
http://159.89.109.117/api/pilihjenis/box1/{idjenistransaksi}
Method: GET (box option 2)
http://159.89.109.117/api/pilihjenis/box2/{idjenistransaksi}

JSON-data:
id : (id of asset)
name: Name of asset
code: Details of the asset code
Contoh: The type chosen is is id=1, income
http://159.89.109.117/api/pilihjenis/box1/1
Return:
{"status":"success","data":[{"id":"24","nama":"Penjualan","kode":"511"},{"id":"25","nama":"Retur Penjualan","kode":"512"},{"id":"26","nama":"Potongan Penjualan","kode":"513"},{"id":"33","nama":"Penjualan Barang","kode":"514"},{"id":"34","nama":"Pendapatan diluar Usaha","kode":"517"},{"id":"35","nama":"Pendapatan Bunga Bank","kode":"518"}]}

Add transaction data

These endpoints are used to record new transaction data based on, user, date and type of assets.
Method: GET / PUT

http://159.89.109.117/api/newtransaction?paramater
Required Parameter:
iduserRequired id yang didapatkandarigetuser, Integer
dateRequired date of format send, DateFormatYmd (ex. 20180529)
jenisRequired transaction type id selected from the API , Integer

box1Required selected asset id from box1 , Integer
box2Required selected asset id from box2, Integer
nilaiRequired the amount of money used sends by numbers , Integer

textRequired write information for the transaction made , String 128 character
JSON
Status :success
Data :: Data successfully saved

Example:

http://159.89.109.117/api/newtransaction?iduser=1&date=20180519&jenis=1&box1=2&box2=5&nilai=5000000&text=Penjualan10paket

Will store transaction data according to the one sent according to the parameters sent. If the required parameters are missing, it will cause a return error and be asked to enter the parameters less

Example:
{"status":"error","data":"Please input Text"}

Get a Transaction List

This endpoint is used to read the list of records previously entered. By using a search in the form of a date, month or year.

Method: GET
http://159.89.109.117/api/transaksi?parameter
Required Parameter:
iduserRequired id obtained from getuser, Integer
dateOptionaldate format searched, DateFormatYmd (ex. 20180529)
looking for years 2018
lookingfoer month 201804
Search for specific dates 20180517

JSON-data:
id : (id transaksi)
box1 : Id asset to optionbox 1
box2 : Id asset to optionbox 2
date :transaction disbursement date
value :value / amount of transaction money
information :transaction description
Contoh:
http://159.89.109.117/api/transaksi?iduser=1&date=20180520

Return:
{"status":"success","data":[{"id":"1","idjenis":"1","box1":"12","box2":"7","date":"20180520","nilai":"500000","keterangan":"Membayar Cicilan"}]}

Note:
To get the name of the type of transaction and the name of the asset, we can call the fire again to get it by using:

Get the name of the Transaction Type: (As in the page above)
http://159.89.109.117/api/jenistransaksi/5
MendapatkannamaAktiva: (untuk box1=12)
http://159.89.109.117/api/activa/12

4.3. Result.

Figure 7 is the main menu of the application. There are 3 parts, namely toolbar header, slide show, and menu content in the form of images. The toolbar header contains a side menu icon, which when touched opens the left menu (left menu). Slideshow will display several images automatically or you can swipe left/right to change the image, which can later be used to put announcements about the latest application updates, or other announcement information that is useful for application users. Menu icons, there are main menus that are often used by users later, namely, adding transactions, viewing daily transaction journals, reports, and analysis. The menu icon when touched, it will go to the desired page.

Figure 7. Main menu

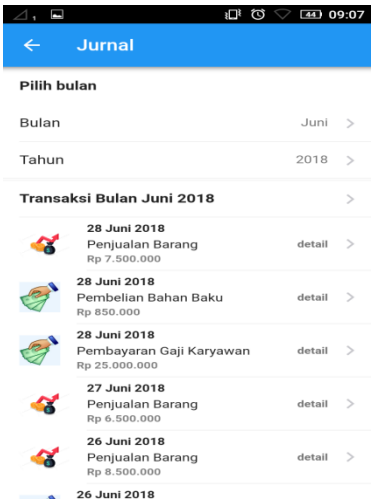

Figure 8. Journal

In the new transaction form, the user can type a new transaction based on the selected day. There are several entries that must be selected and entered by the user including:

1. Date, the user can choose the date of the day when the user uses the application, and 30 days before the day. In other words, users will only be able to report new transactions before expiring within 30 days.

2. Users can choose the type of transaction, including income, expenses, debt, debt payments, receivables, paid receivables, additional capital, capital withdrawals, capital transfers and adjustments.
3. Users can choose the origin of the transaction and the purpose of the transaction, whether entered into cash, assets or other.
4. Users can fill out information about the use of the funds for what or where, up to the user.
5. Users can fill in the amount / nominal money from the transaction.
6. Then the user can click the save button, to record transactions into the database, which will be displayed in daily journals and other reports.

If user presses the journal icon on the main menu, the daily journal display will appear as shown by Figure 8. Users can change the month and year to display transactions for one month, as desired by default is the month and year according to when the application runs.

In the list, there is a transaction list sorted by the latest date until the longest transaction. The list contains information about the transaction date, transaction information, and the amount of money in the transaction. There is also an icon image to make it easier to distinguish each type of transaction. If the user presses on one list, it displays the details of one transaction, which includes the date, information, number, date entered, and user inputting, because it is possible in one business unit, there are several users.

Figure 9. Report

Figure 10. Analysis menu

If you choose the report menu, it will display the Figure 9. There is a slide image for announcements or other information, then there is a sub-menu for the report including:

1. Journal report, this report is used to record journals from a particular month according to user requests.
2. The ledger report, displays transaction reports in the form of ledgers, in the ledger report the user can specify a specific month with a range that can be determined.
3. The balance sheet report, displays the report in the form of a trial balance, can be determined by the user based on the desired month.
4. Profit/Loss Reports, displaying reports in the form of profit/loss reports, the user can determine based on the desired month.

In the main menu, when we choose the analysis menu, it will display Figure 10. The analysis sub menu consists of:

1. Analysis of financial statements

A. Liquidity Analysis

For a liquidity analysis of the current ratio and quick ratio, the following formula is used to calculate the Current Ratio and Quick Ratio.

Current ratio = Current assets ÷ Current liabilities

$$Quick\ Ratio = \frac{Current\ Assets - Inventory}{Current\ Liabities}$$

B. Activity Analysis

Current Ratio = Current Assets ÷ Current Liabilities

$$Quick\ Ratio = \frac{Current\ Assets}{Current\ Liabilities}$$

Inventory Turnover = Cost of Goods Sold ÷ Inventory

$$Average\ Collection\ Period = \frac{Account\ Receivable}{Average\ Sales\ per\ Day} \quad \frac{Account\ Receivable}{\frac{Annual\ Sales}{365}}$$

Total asset turnover = Sales ÷ Total Assets

C. Probability Analysis

$$Gross\ profit\ margin = \frac{Sales - Cost\ of\ goods\ sold}{Sales} = \frac{Gross\ profits}{Sales}$$

Operating Profit Margin=Operating Profit ÷ Sales

Net profit Margin = Earnings Available for Common Stockholders : Sales

Return on Total Assets (ROA) = Earning Available for Common Stockholders ÷ Total Assets

D. Debt Analysis

Debt ratio = Total liabilities ÷ Total assets

Times interest earned ratio = EBIT ÷ taxes

2. Analysis of Company Conditions

Altman z score

$Z = 0{,}012X_1 + 0{,}014X_2 + 0{,}033X_3 + 0{,}006X_4 + 0{,}999X_5$

where:

X1= Working Capital / Total Assets

X2= Retained Earnings / Total Assets

X3= Earnings Before Interest and Taxes/Total Assets

X4= Market Value of Equity/ Total Liabilities

X5= Sales/Total Asset

Z= Z-Score (General Ratio)

3. Feasibility Study Analyze

A. Payback Period

B. Net Present Value

By using a formula:

$$NPV = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} - CF_0$$

C. Net Present Value (NPV)

$$PI = \frac{\sum_{t=1}^{n} \frac{CF_t}{(1+r)^t}}{CF_0}$$

D. Internal Rate of Return

$$\$0 = \sum_{t=1}^{n} \frac{CF_t}{(1+IRR)^t} - CF_0$$

$$\sum_{t=1}^{n} \frac{CF_t}{(1+IRR)^t} = CF_0$$

	A	B	C
1	DETERMINING THE INTERNAL RATE OF RETURN		
2		Year-End Cash Flow	
3	Year	Project A	Project B
4	0	$ (42,000)	$ (45,000)
5	1	$ 14,000	$ 28,000
6	2	$ 14,000	$ 12,000
7	3	$ 14,000	$ 10,000
8	4	$ 14,000	$ 10,000
9	5	$ 14,000	$ 10,000
10	IRR	19.9%	21.7%
11	Choice of project		Project B
	Entry in Cell B10 is =IRR(B4:B9). Copy the entry in Cell B10 to Cell C10. Entry in Cell C11 is =IF(B10>C10,B3,C3).		

4. Loan Amortization simulation

Principle	Interest	Time	Amortitation	Flate	Number		Date	Saldo	Principle	Interest	Total
25,000,000	11.00%	6	4,301,364	6.47%				25,000,000			
						1	01-Oct-18	20,927,803	4,072,197	229,167	4,301,364
						2	01-Nov-18	16,818,277	4,109,526	191,838	4,301,364
						3	02-Dec-18	12,671,081	4,147,196	154,168	4,301,364
						4	02-Jan-19	8,485,869	4,185,212	116,152	4,301,364
						5	02-Feb-19	4,262,292	4,223,577	77,787	4,301,364
						6	05-Mar-19	0	4,262,293	39,071	4,301,364

5. CONCLUSIONS

5.1. Conclusions

a. This financial application (APIK KU) is expected to be able to assist SME owners in preparing financial/bookkeeping reports that are more systematic, precise and have a direct impact on decision making.

b. This financial application is expected to be able to answer SMEs needs in financial application in order to report financial statement that can be saved, download, upload and can be sent through android smartphone.
c. This financial application (APIK KU) will be the first choice for SME owner because this application does not costly in the operation.
d. This financial application (APIK KU) is expected to be able to assist SME owners to get loan facility from the bank because the output of this financial reporting is based on loan bank application standard.
e. Making decision for investor is easier when SME uses APIK KU application.

5.2. Limitations

1. This application (APIK KU) is still in the design stage.
2. This appication (APIK KU) has not be tested directly to SME owner.

5.3. Recommendation

It is recommmeded to test APIK KU directly to SME owner in order to get feedback and to make it better.

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References

[1] Bashir, I. and Madhavaiah, C., "Consumer attitude and behavioural intention towards internet banking adoption in India", *Journal of Indian Business Research* 7(1), (2015).
[2] BPS Indonesia, https://www.bps.go.id/statictable/2014/01/30/1322/tabel-perkembangan-umkm-pada-periode-1997--2013.html, 2018.
[3] Ediraras, T. D., "Akuntansi dan Kinerja UKM". *Jurnal Ekonomi Bisnis*, 15(2). (2010).
[4] Hariyadi. "Faktor–faktor yang Mempengaruhi Penggunaan Informasi Akuntansi pada Usaha Mikro, Kecil, dan Menengah (UMKM) yang Bergerak di Bidang Jenis Usaha Makanan di Kota Tanjungpinang", *Jurnal Umrah* (2014)
[5] Leiva, F., and Climent, S., "Determinants of intention to use the mobile banking apps: An extension of the classic TAM model". *Elsevier Espa˜na* (2016).
[6] Lestiawan, H., and Mahmud, "Purwarupa Pembelajaran Mandiri Sistem Aplikasi Akuntansi UMKM Berbasis Web Dalam Pemberdayaan Usaha Masyarakat Jawa Tengah", *Prosiding SNATIF ke-1* (2014).
[7] Makanyeza, C., "Determinants of consumers' intention to adopt mobile banking services in Zimbabwe" *International Journal of Bank Marketing* (2017).
[8] Mazhar, F., "An Investigation of Factors Affecting Usage and Adoption of Internet & Mobile Banking In Pakistan", *International Journal of Accounting and Financial Reporting*, 4(2) (2014).
[9] Meiliana, K., and Dewi, "Analisis Penggunaan Sistem Informasi Akuntansi Pada Usaha Kecil dan Menengah di Yogyarakarta", *Modus* 27(I), 29-40 (2015).
[10] Nguyen, T., Cao, T., and Dang, P., "Predicting Consumer Intention to Use Mobile Payment Services: Empirical Evidence from Vietnam", *International Journal of Marketing Studies* 8(1), (2016).
[11] Rifani, L., and Aini, N., ""Aplikasi Sisitem Informasi Akuntansi Pada Usaha Kecil Menengah Kampung Kue Rangkut Surabaya", *Seminar Nasional Sistem Informasi Indonesia* (2016).
[12] Singh, S., and Srivastava, R.K., "Predicting the intention to use mobile banking in India", *International Journal of Bank Marketing* (2018).
[13] Thakur, R., and Srivastava., M., "Customer usage intention of mobile commerce in India: an empirical study", *Journal of Indian Business Research* 5(1), 52-72 (2013).
[14] Yan, W., and Zhang, D., "Factors influencing the intention to use information service mashups: an empirical study of digital libraries in China", *The Electronic Library* 34(4), (2016).

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