MASMe: Developing Mobile Accounting Software for Micro Entrepreneurs

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Abstract—In this study, a new mobile accounting application called MASMe has been developed to assist micro-entrepreneurs in the area of financial management and accounting. The MASMe prototype helps to simplify finance and accounting processes and produce real-time reporting both online and offline. This will help micro-entrepreneurs to understand the accounting concepts and to obtain information to help manage their business and better decision-making. The system will also enable micro-entrepreneurs to apply for business loans and government grants from government agencies and banks to expand their business. As mobile accounting software, MASMe is reasonably simple and straightforward and uses the simple concept of money-in and money-out (i.e. cash flow) given many micro-entrepreneurs have limited finance and accounting knowledge. Employing the Waterfall method of the System Development Life Cycle (SLDC) the requirements of users were collected, and the design of the model was constructed using the Unified Modelling Language (UML) technique. The model was validated and tested through the development of the prototype with feedback received from users of the system. While several inherent limitations were noted, these limitations are expected to be overcome in future versions of the application with the ability to print invoices, export data into Microsoft Excel and to expand the loan payment function of the application to benefit micro-entrepreneurs.

Index Terms—Micro-Entrepreneurs; Financial Management And Accounting, MASMe; Waterfall; System Development Life Cycle (SLDC); Unified Modelling Language (UML).

I. INTRODUCTION

Systematic financial statements and accounting records are essential to assist micro-entrepreneurs to manage their cash flow within the business. Indeed, by managing their cash flow efficiently, micro-entrepreneurs can design strategies to strengthen and grow their business. Previous studies have indicated that many micro-entrepreneurs in Malaysia have failed to survive or have not been able to expand their business due to their inability to manage finances [1]-[4]. For example, a study of small agropreneurs in Terengganu found that only a small portion of entrepreneurs prepared their accounting records [5]. Notwithstanding, this suggests that small entrepreneurs are less concerned about the importance of recording their business affairs, especially the financial and commercially sensitive elements of the business. Furthermore, many small entrepreneurs, whether online or offline, do not comprehend the significance and necessity of having a robust financial accounting system to control their cash flow. Indeed, some small entrepreneurs may not even be aware of the profits generated by the business. Consequently, small entrepreneurs are facing difficulties and challenges in applying for financial loans with many agencies such as

Tekun, AIM, MARA, and Bank Rakyat [3]. Sadly, upon failing to attain a financial loan, they are therefore not able to inject further funds and capital to grow and diversify their business, and worse case, cannot sustain their business.

The absence of having systematic accounting records often results from the limited knowledge of basic accounting concepts and the management of financial records [2]. In fact, many micro-entrepreneurs are not even aware of the need and requirements for financial reporting, including the need for an income statement, balance sheet and cash flow statement [2]. Instead, many consider that accounting is a complicated process and system of accounts incorporating debits and credits each month within the general ledger, double entry bookkeeping systems, financial statements, and so forth, etc. However, limited knowledge of financial accounting should not be seen as a major impediment.

To overcome the limited knowledge and many of the associated problems experienced by many of these micro-entrepreneurs in managing and preparing accounting records, this study aims to develop a mobile accounting system for micro-entrepreneurs, known as MASMe. Notably, the system is different from other accounting software existing in the market (e.g., UBS, Autocount, SQL) because it does not require the user to understand the basic accounting concepts and principles. Moreover, the system only requires the daily movement of financial transactions (i.e. cash flow) information. The information is collected and summarised daily and will automatically be converted into financial reports, namely; the profit and loss statement, balance sheet, and cash flow statement. Furthermore, the accounting system developed as a mobile application will enable micro-entrepreneurs to access the system from their smartphone or other portable devices (i.e. tablets, laptop, etc.). Using a mobile platform, entrepreneurs will quickly be able to update their daily income, sales information and financing in real-time. Accordingly, this study will design and develop the prototype system using the traditional waterfall approach.

This paper is structured into several sections. Section II provides relevant background and profiles of micro-entrepreneurs in Malaysia and existing accounting software. Section III describes the research methodology and describes the system development process. Section IV, presents and discusses the research findings, which are illustrated using screenshots of the prototype. Lastly, Section V and VI, summarises and concludes the work undertaken in this study by discussing the implications, limitations and areas proposed for future research.

II. BACKGROUND OF THE STUDY

A. Micro-Entrepreneurs

Micro-entrepreneurs are small-scale businesses that vary in the provision of trade products and services, namely; foods, scarves, women's accessories, and baby clothing, etc.). Further, most micro-entrepreneurs specialise in providing their goods or services to serve local areas. The definition of a small trader varies. Majlis Amanah Rakyat (MARA) defines a small business as having paid-up capital of RM200,000, whereas, CGC defines a small business as paid-up capital below RM100,000. Valid from 1 January 2014, the SME Corporation Malaysia (SMECORP) introduced a new definition to describe micro businesses based on two categories; sales per annum and full-time employees. Accordingly, SMECORP defined the micro-enterprise as a business generating sales annually less than RM300,000 or employing five or less full-time employees (FTEs) [6]. In Malaysia, micro-enterprises' represent about 75% of the business and the majority of micro-enterprises' are within the services industry [7]. Notably, micro-enterprises' contribute about 8 % of the nation's GDP [7].

The government also helps micro-entrepreneurs by providing micro (small) credit loans to help expand their business via Amanah Ikhtiar Malaysia (AIM), Tabung Ekonomi Kumpulan Usaha Niaga (TEKUN), Perbadanan Jaminan Kredit (CGC), and MARA. In the 2013 budget, the government allocated RM180 million to TEKUN, with a total amount of RM2.86 billion since 1998, distributed to 272,104 micro-entrepreneurs [7]. Through the government program, many micro-entrepreneurs were able to obtain further capital easily, and without hindrance. Hence, the businesses were able to take advantage of the government's aspirations to create a competitive environment for micro-entrepreneurs.

B. Accounting System

Accounting practices and disciplines form the centrepiece or backbone of business including micro and small enterprises. An accounting system refers to a method to capture, record and report financial elements of business events that transpire systematically [8]. Further, accounting systems are utilised by businesses to help manage income, expenses, and other financial tasks and activities. Upon collecting and capturing information within the system, the records are summarised and presented in the form of financial statements (i.e. balance sheet, income statement, and cash flow statement), to stakeholders (including shareholders) who are internal and external to the business. Furthermore, an accounting system is vital and useful in the decision-making process and evaluating strategic opportunities within the business to meet its strategic goals and objectives. In other words, an accounting system can be seen as a process of recording business and financial data into meaningful information for decision-making purposes. The proper accounting system is essential to facilitate the flow of financial health of a business.

A proper accounting system will enable businesses to monitor and track financial transactions, including purchases (i.e. commitments and expenses), sales (invoicing and accounts receivable), liabilities (funds and accounts payable), and so forth [9]. Expenses can be described as cash flow amounts flowing external (out) from the company to other companies and individuals in exchange for services or goods received. Invoices or income can be described as the amount of cash received or generated from sales. All liabilities that help support and sustain the business, whether these are through bank loans, services rendered by other parties, and utilities (power, water, etc.), can be classified as funding (i.e. the need to fund). Adopting reliable accounting systems not only helps to maintain the accuracy of financial records (i.e. bookkeeping) but also helps to generate financial information as mentioned previously to support the operations of the business.

One of the many benefits of an accounting system will be the management of records and data within the system and the ability to retrieve historical and comparative information for statistical and decision-making purposes. From an external auditing perspective, financial reports, transactions and other information held within the system should meet regulatory requirements and financial accounting standards (FIS). Also, the functionality and capability of the system should be able to produce statistical reports or respond to queries to support management or other parties (i.e. shareholders, auditors, users etc.) to make effective and timely decisions. Accordingly, many business owners and business users are seeking accounting information systems (AIS) that are user-friendly, affordable and easy to maintain.

C. Micro-Entrepreneurs and Accounting System

A study by [10] found that small-medium sized enterprises (SME's) and larger companies often had difficulty acquiring external funding due to limited and reliable information on the quality of their operations and management aspects of the business, especially financial management. Lenders (i.e. financial institutions and banks) are reluctant to provide credit facilities to these businesses. In contrast, if in fact, they do lend the business funds they will often impose higher lending costs to cover the risk of the loan (i.e. safeguarding their investment). Further, [11] reported that many small businesses are experiencing late or delayed payment problems. Most SMEs are undercapitalised with poor credit management practices and processes, and the shortage of working capital subsequently affects their future operations. Therefore, maintaining up-to-date and accurate bookkeeping records is useful to monitor and assess the operations of the business and to minimise against possible financial situations (i.e. fraud) that would adversely impact the organisation before becoming critical or unmanageable.

In Malaysia, prior studies suggested that many micro-entrepreneurs have failed to expand or sustain their business [1],[2],[3],[5]. Indeed, many factors contribute towards the failure of micro-entrepreneurs to manage their financial operations within various industries in Malaysia. For instance, a case study on five micro-entrepreneurs who borrowed money from AIM, known as SAHABAT, in Negeri Sembilan and Melaka, [2] identified three main issues that impede micro entrepreneurs in expanding their business. Firstly, the management of accounting records and finances. Only two out of five micro-entrepreneurs kept systematic accounting records. One micro-entrepreneur started his business in 2004 but did not maintain or keep systematic accounting records. Notably, this was primarily due to the lack of knowledge and skill in managing business accounting and finances, not maintaining sufficient and proper accounting records, along with limited knowledge and skills in financial management disciplines. The issue of maintaining (or lack of) improper accounting records, also inhibits businesses to acquire financial loans to expand their

business. Critical Success Factors (CSF) are the most important element for micro enterprises to demonstrate and evidence their business performance, especially towards achieving their business goals, mission and financial targets [12]. Indeed, a significant issue that many businesses overlook or neglect.

In a study regarding small agropreneurs in Terengganu, [5] reported that one of the successful agropreneurs mentioned their CSF is:

... merekod segala urusniaga, untung rugi syarikat.

However, in their study, the results of the site visits and examination of documentation highlighted that, in general, financial management and the management of financial accounts was extremely poor [5]. The study further revealed that only a small portion of entrepreneurs prepare and update accounting records and use external auditing services. Surprisingly, most entrepreneurs were not willing the discuss the management of their financial accounting records. The result of the study was in line with prior studies reporting that micro-entrepreneurs, especially Bumiputras, were less skilled in financial management aspects and practices. Therefore, there is an urgent need for micro-entrepreneurs to acquire the knowledge to manage their accounting records and finances. Moreover, this knowledge is considered to be necessary to help SMEs and micro-entrepreneurs to be sustainable, profitable and competitive.

In summary, prior research has shown that financial management is a critical aspect in the management of small-scale business entities. However, many micro-entrepreneurs are not aware of or know how to maintain proper accounting records or comprehend the principles surrounding cash flow. Moreover, many micro-entrepreneurs are ignorant about the need for resources, do not make the distinction between their personal finances and business finances, actual profit (or loss) and hence, are not able to sustain or expand the operations of the business.

III. METHODOLOGY

The traditional waterfall approach was used to emphasise the logical progression of stages throughout the software development lifecycle (SDLC) Figure 1. The five stages of the approach are described below.:

1. *Requirements Analysis.* In this stage, the user requirements for the proposed system are gathered and documented. The initial requirements for development of the prototype were adapted from the prior literature. Three micro-entrepreneurs in Kedah were also interviewed to collect information on the functional and non-functional requirements. The requirements from the various sources were then analysed and separated into functional and non-functional requirements.

2. *Design.* At this stage, the internal and external designs of the system are drafted. The internal design focuses on the primary functions of the system. Data flow and sequence diagrams were created using 'case' flowcharting software to represent the internal operations of the proposed system, including its interfaces. At this stage, the software (technical) requirements specification for the system is also developed. Cascading Style Sheet (CSS), JavaScript

and PhoneGap were used to develop the features to represent the mobile application environment.
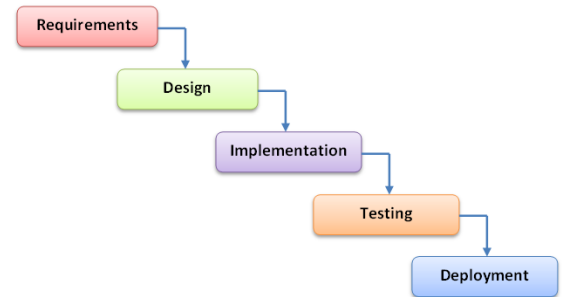

Figure 1: Waterfall Methodology

3. *Implementation.* The prototype of the system is developed using PhoneGap which is an open source framework used by software programmers to develop mobile applications using web-enabled technology. This framework helps the programmer to avoid the complexity of writing the application in multiple languages such as C+ and Java for all relevant mobile platforms. In other words, PhoneGap provides for cross-platform applications using HTML, CSS and JavaScript as a tool to quickly transfer web development skills into developing various mobile applications. Also, by using PhoneGap, the prototype (MASMe) could be coded and executed by the module. Finally, in this stage, the modules are combined and internally tested.

4. *Testing.* Once the system has been developed, it should undergo rigorous testing to ensure that the system (and software) can perform as per the functional user requirements collected in stage 1. The actual user(s) of the system at this stage are expected to test the system based on how they would transact or carry out their (day-to-day) system-based tasks. The users are expected to provide feedback to help resolve any issues and enhance the system before deploying the system in a 'live' environment. In testing the system, 40 micro-entrepreneurs were recruited to use the system and were also requested to answer a set of questions, contained within a questionnaire regarding the usability of the system and the level of satisfaction.

5. *Deployment.* Once the system has been tested and any issues resolved, the system is ready to implement and 'go live'.

IV. FINDINGS

By performing the waterfall methodology, we managed to collect and capture users' requirements and identified ten functional requirements for MASMe.

The logical model of the system is presented in several diagrams such as data flow diagram, use case and sequence diagram. The list of some of the functional requirements is shown in Table 1.

The listed requirements were then conceptualized using use case in Figure 2. Basically, there are ten requirements that MASMe needs to handle, which are login application, manage profile, make sale, make purchase, pay expenses, withdrawal, buy asset, make loan, manage report and exit application. The requirements are grouped into three main menus: Business Profile, Financial System and Financial Report.

Table 1
Functional Requirements

| Functional Requirement		Description
Main	*Sub*	
Business Profile (Pofil Perniagaan)	Business Information	• User taps on Business Information button • User fills his/her business information – Company Name, Registration No., Address, etc. • User can taps on Back button to return to Business Profile Menu
	Capital Resource	• User taps on Capital Resource button • User provides amount of capital • User can taps on Back button to return to Main
Financial System (Sistem Kewangan)	Transaction	• User taps on Transaction button • User records transaction – date, type of transaction (income, cost, expenses or withdrawals) • User can taps on Back button to return to Financial System Menu
	Purchase Asset	• User taps on Purchase Asset button • User records transaction for purchasing asset – date, name, resit no, amount, etc. • User can taps on Back button to return to Financial System Menu
Financial Report (Laporan Kewangan)	Income and Loss Statement	• User taps on Income and Loss Statement button • User can choose year, month start and month end • User can preview and print the statement • User can taps on Back button to return to Financial Report Menu
	Financial Analysis	• User taps on Financial Analysis button • User can choose year and type of account (income, cost, expenses, withdrawal, etc.) • User can preview and print the statement • User can taps on Back button to return to Financial Report Menu
Exit Application		• User taps on exit application button to exit.
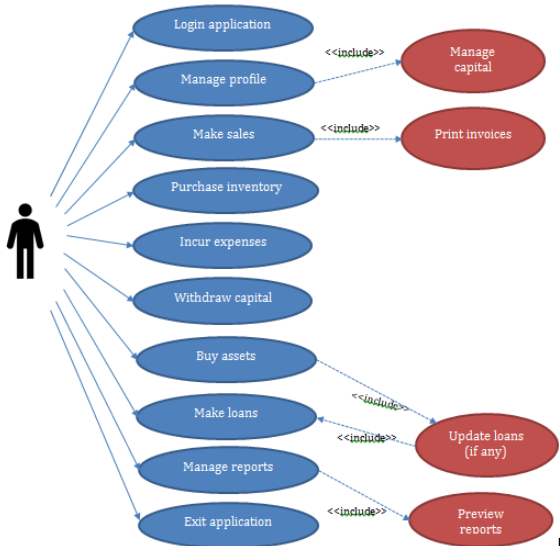
Figure 2: Use Case Diagram for MASMe

We also have a complete model consist of activity diagram and sequence diagram for each of the requirements. However, due to limited space we do not include all here.

The financial concept of this application is a cash-basis concept. The most important element of the system is how the business should handle money in and out daily, as shown in Figure 3. The flows of the system start with recording daily transactions that involve money in, such as sales and other income, and money out, such as cost of goods sold (COGS), operating expenses and administrative expenses. Further, the system will be able to capture money in from initial capital by the owner as well as loan made by the owner. Purchasing of assets and withdrawal of money for personal use will be taken care of too in order to produce a complete entry of business process.
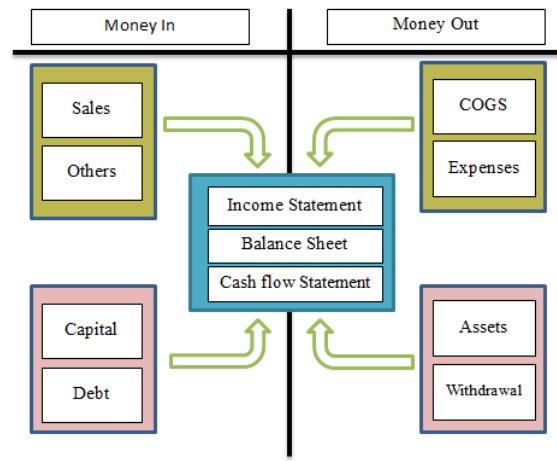

Figure 3: Data Flow Diagram for MASMe

Then, all the entries will be processed through the system application which are built following the accounting concept to provide useful financial statement including statement of comprehensive income (known as income statement), statement of financial position (known as balance sheet) and statement of cash flow.

Based on these conceptual designs, we developed the prototype for MASMe. The pictures below were captured after the installation of the application.

The first page on the system is login page, as shown in Figure 4. User needs to register in order to obtain the username and password, and then will be able to access the application.

Figure 4: User Login Page

Once a user can access the application, the main menu appears (Figure 5). All three buttons will direct to another sub-menu page when user clicks the button.
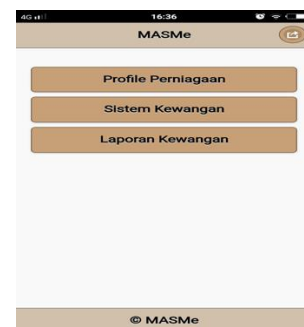

Figure 5: Main Menu of MASMe

Figure 6 shows the example of Business Profile sub-menu. It contains three buttons for the user to choose. When a user clicks on the "Maklumat Perniagaan" button, s/he will be directed to fill in her/his company information, as shown in Figure 7.

Figure 6: Business Profile Page

Figure 7: Business Profile Form Menu

When the user clicks on the "Sistem Kewangan" button in the main menu page, the sub-menu page as captured in Figure 8 will appear.
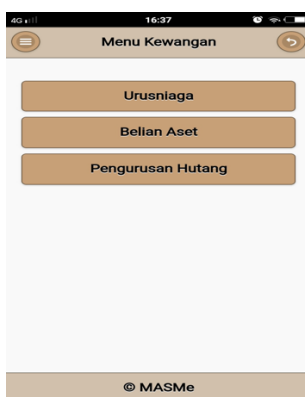

Figure 8: Financial System Sub-Menu

User can click on "Urusniaga" to enter the daily transaction. The transaction can be on money in (sales, withdrawal) or money out (purchase, expenses). Figure 9 illustrates these options.

For example, a user can click on "Hasil" button to enter daily sales from her/his business (Figure 10). User can do this repeatedly and for other types of transactions (cost, expenses and withdrawal) too.
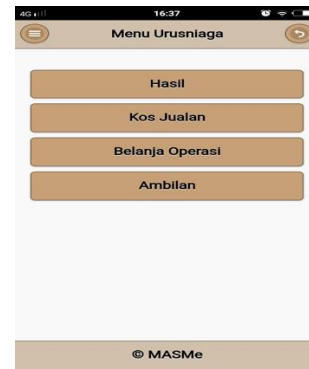

Figure 9: Transaction Page

Figure 10: Sales/Revenue Page Entry

Once the transactions are completed, user can view the financial reports from the Financial Report sub-menu, such as Income Statement, Financial Position Statement and analysis by type of account. Figure 11 illustrates the income statement and Figure 12 shows that the statement can be printed and saved by clicking the print button.

An interesting feature of this application is that it will be able to produce analysis by account type. With this feature, user will be able to monitor his/her business monthly or yearly performance. Figure 13 demonstrates the sales analysis between January 2017 and August 2017.
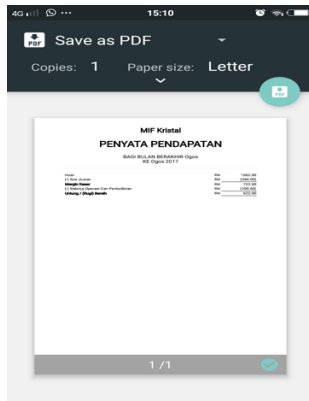

Figure 11: Income Statement Page

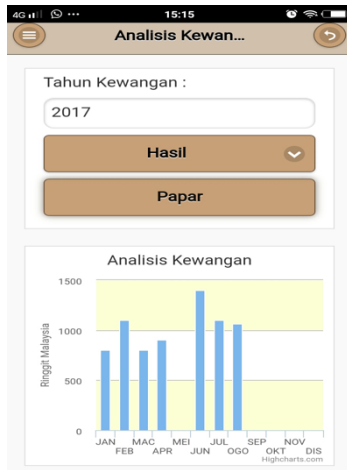Figure 12: Printed version Income Statement

Figure 13: Analysis Page

V. DISCUSSION

Validation of the constructed model was validated during the development of the prototype. The functional and non-functional requirements were created using sequence diagrams, case diagrams, activity diagrams and finally, data flow diagrams to complete and develop the MASMe prototype. To further validate the prototype, a survey was undertaken with 40 micro-entrepreneurs in Malaysia, who were aged between 20 and 49 years of age and who were also involved in selling various products online or offline. The participants were requested to answer and complete a questionnaire based on their self-assessment regarding the usability of the system. The questionnaire employed a five-point Likert-type scale with points ranging from 1 'strongly disagree' to 5 'strongly agree'. Before answering the questions, the participants were requested to use the software aided by a video tutorial.

Figure 14 illustrates the results of the usability test that covers the application design, graphical user interface (GUI), utilities, as well as the user interface (UI) input, UI output, UI structure and overall usefulness of the application. The results indicated that the respondents all concurred that the usability of the system was acceptable for their business.
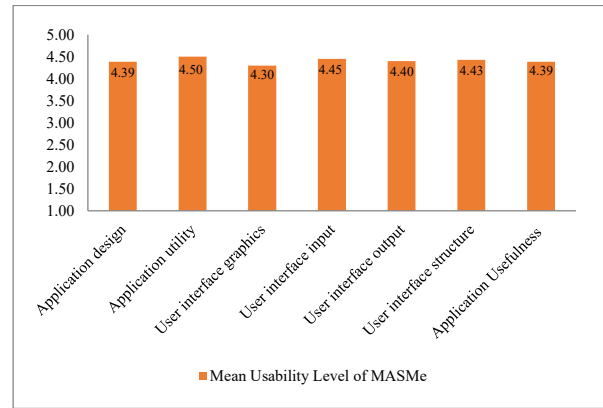

Figure 14: Usability Test

VI. CONCLUSION

Sound financial management practices are vital in any type or form of business. However, this study has found that many micro-entrepreneurs do not fully understand or comprehend the need to maintain proper accounting records and are often unable to make the distinction between their personal finances and the finances of the business, including the actual profit or loss of their business. Furthermore, due to their limited knowledge of accounting disciplines and practices, they often fail to maintain or expand their business operations. Therefore, to enhance the understanding of micro-entrepreneurs regarding financial management and accounting systems, a mobile accounting application prototype (MASMe) was developed and tailored towards the needs of micro-entrepreneurs. The system is easy and reasonably straightforward to use and does not require the user to understand basic accounting principles such as the rules associated with debits and credits. The system only requires users to enter in the numbers representing inputs (sales, capital, loans) and outputs (expenses, withdrawals). The system is explicitly designed to aid micro-entrepreneurs with limited or no accounting knowledge.

Additionally, the system can produce business and financial reports in real-time and help entrepreneurs to make timely decisions. Furthermore, with proper accounting records and reporting capabilities, the system will enable micro-entrepreneurs to apply for business loans and government grants from government agencies and banks to expand their business. Therefore, this study has met the intended research goals set out for this work. However, several limitations in the application exist. These limitations will be overcome in the next version to include additional functionality, namely; the ability to print invoices, export data into Microsoft Excel and to expand the loan payment function of the application to benefit the users (micro-entrepreneurs).

REFERENCES

[1] Suraiya I., Ahmad Raflis C.O. and Azhar A. (2012). Tales of the Survivors: The Bumiputera Entrepreneurs' Experience. Asian Social Science Journal, 8(3)

[2] Ummi S. A.R. and Isma A.J. (2012). Mentranformasi Usahawan Mikro: Kajian Kes Sahabat AIM. Unpublished Paper. Presented at

Persidangan Libatsama Universiti dan Komuniti (LUK 2012). Penang, Malaysia.

[3] Jumaat A. M., Ahmad Raflis C.O., Zaimah D. and Hamdino H., (2012). Amalan Pengurusan Kewangan di Kalangan Usahawan Asnaf. Prosiding PERKEM, VII, Jilid 2,762 – 769.

[4] Rosdi (2002), Faktor-faktor Kegagalan Usahawan Melayu, Unpublished Research Paper. Majlis Amanah Rakyat, Johor Bahru.

[5] NurulHuda C. A. and Ramlee M. (2009). Kajian Kes Usahawan Tani Industri Kecil Sederhana (IKS) Bumiputera di Negeri Terengganu. Jurnal Pendidikan Malaysia 34(2): 143 – 165.H.

[6] SME Corp Malaysia, 2013, http://www.smecorp.gov.my/vn2/node/37

[7] Laporan Ekonomi (2014). Portal Rasmi Kementerian Kewangan Malaysia, Retrieved May 2, 2018 from Laporan Ekonomi 2013/2014. http://www.treasury.gov.my/pdf/ekonomi/le/1314/bab3.pdf.

[8] Gelinas J. U., Sutton G. S., and Hunton E. J. (2005). Accounting Information Sytems 6th Edition. Thomson South-Western.

[9] Hall A. James (2013). Accounting Information System 8e, USA: South-Western Cengage Learning.

[10] Gregory, Brian T., M.W Rutherford, S. Oswald and L. Gardiner. (2005). An empirical investigation of the growth cycle theory of small firm financing. Journal of Small Business Management, 43(4), 382-392.

[11] Howorth, Carole and N. Wilson. (1999). Late payment and the small firm: an examination of case studies. Journal of Small Business and Enterprise Development, 5(4), 307-315.

[12] Mohd Hassan M.O. (1998). Faktor-Faktor yang Mempengaruhi Kejayaan Usahawan Kredit Mikro di Negeri Johor. Unpublished Research Paper. UTM.