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by Fathoni Fathoni

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Design of a Mobile based Academic Cyber Counselling Application in Higher Education

Zakirillah¹ .Noorminshah A. Iahad² .Miftachul Huda³ .Fathoni⁴ .Rahmat Izwan Heroza⁵

Author(s)ContactDetails:

^{1,4,5} *Jurusan Sistem Informasi, Fakultas Ilmu Komputer, Universitas Sriwijaya*

² *Department of Information Systems, Faculty of Computing, Universiti Teknologi Malaysia*

³ *Faculty of Islamic Civilisation, Universiti Teknologi Malaysia*

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Abstract

This article aims to propose a design of academic cyber counselling based on mobile application. This is to promote the analysis that would be transformed in the process of academic counselling. Designed in the context of higher education (HE), the outstanding expectation will be achieved through developing the mobile application of academic counselling (AC). The findings reveal that the mobile application based academic counselling has a subsequent stage to enable in getting better communication among students and advisors. This study will contribute to propose a design of academic cyber through mobile device where this aims to help students to solve their academic issues, such as reflecting the learning achievement.

Keywords: academic counselling (AC), mobile application, Higher Education.

1. INTRODUCTION

Over the last 10 years, the term cyber is one of the most widely known current trends which came as integration of digital devices, information technology, and virtual reality. This was further reformed into such variety of approaches that would help client in getting convenient and satisfactory services. Previous studies have applied this innovation using various diverse approaches in sport (Hurley, 2016), spiritual enhancement (Chawki, 2010) and hosts of others. One of such cyber innovations is cyber counselling. This initiative has had numerous benefits such that ensures clients at separate locations or from remote areas can access the service and this can also be extended to wider population at large.

To enhance the learning process in academic learning, students and advisor are expected to have an inseparable link of communication especially when using digital devices such as mobile or smart phones. To achieve this, the academic planning committee has the responsibility to

fulfil the necessary requirement of establishing behavioural integrity and consistency between an advisor and the student. Moreover, using mobile based design in higher learning institution, academic counselling can be further utilized to help counselling services where student and advisor are in separate locations apart using electronic devices and internet.

This paper has been structured towards enhancing academic counselling unit at Information System Department (ISD) in Universitas Sriwijaya (UNSRI), Indonesia. The current procedure of AC services at ISD starts with Advisor announcing the schedule, so that the student can arrange the counselling session with the advisor. After student and advisor decided the schedule, then student is expected to bring the document of study plan (KRS) and study achievements (KHS) to get agreement from the advisor. Advisor would analyse the KHS and establish a discussion with student about problem and difficulties faced on the past semester. After that, advisor will ensure whether the student's KRS is relevant to get an agreement or not. Based on the feedback from the students, the current existing services system has some limitation; Such as inconsistent activity, difficulties for advisor to monitor student's activities, and the reporting procedure to head of ISD are ineffective.

Many studies have been conducted on cyber counselling in areas of psychology (Mishna et al, 2013; Runions et al, 2013), social work ethics (Fang et al, 2014; Mishna et al, 2014) and mental health (Mishna et al, 2015) but very limited scholarly studies were found in the academic field most especially in higher education where this service could be utilized amongst students' in delivering academic counselling services effectively; therefore the aim of this study is to explore this phenomenon. Thus, this research will contribute towards proposing a design of academic cyber counselling system through mobile which will be designed its application system. The aim is to help

students' solve academic issues, such that would reflect the learning achievements.

The proposed design is expected to enhance AC at ISD, UNSRI and also enable better communication among students and advisors. Section two of this paper presents the definition and current existing cyber counselling system. The benefit and factor for using online and mobile communication application are also discussed. The third section discussed the methodology used to design the proposed mobile academic cyber. Next, section four discussed the design of mobile application and finally, section five concludes this paper.

2. LITERATURE REVIEW

2.1 Definition of Cyber

Cyber is regarded as the way to respond to client request using digital devices. In academic counselling, cyber offers the counselling with greater convenience and flexibilities (Mishna et al, 2015). To achieve this, cyber requires the use of advanced technology to deliver counselling services through electronic means (Salleh et al, 2015; Harris & Birnbaum, 2015). Cyber has been thought to have a distinctive feature which can be improved by adopting the slide assisted using IT technologies. This may enhance students to effectively use technology in practice to illuminate service anywhere and anytime (Kolog et al, 2014).

It has empowered users to access any aid, whenever, anywhere, and online services have allowed user to access internet benefits even while travelling (Lee et al., 2011). Cyber can be also known as online applied online setting such as mobile learning to develop therapeutic communication. Moreover, with the advent of digital world, user interest for online communication increases. Online modalities are efficacious than face-to-face (Salleh et al., 2015). In this study, computer mediated communication was formed to consolidate in aligned with alliance and modality. It can be seen that bond has been applied in accordance with offering cyber more effective (Holmes & Foster, 2012). In order to see the latest application model of cyber counselling, it is worthwhile to recognize such distinct current model from existing works throughout the world.

2.2 Current State of Cyber

The research on cyber is not new. There are quite number of studies in this field. One of such studies is a design of mobile learning application for Android (Mamat & Azmat, 2013; Seko et al, 2014). This application aims to help students in their learning at anytime and anywhere and with this development, it can be seen that there has been a shift from the current traditional classroom to e-learning systems. This application was designed to work in accordance with the desired expectation or capabilities. In particular, the new version of mobile application using the approach of agile software development which is known to be cost effective and with greater capabilities compared

to the previous computing platform and infrastructure (Chopvitayakun, 2015).

In addition, the improvement has been widely arranged into the counselling program service. It aims to increase performance towards monitoring the activities of each student by offering guidance from advisor. Moreover, the benefits include enabling users to learn within the comfort of their home. This indicated that the design offered greater flexibility with limited risk and such that meet user specification (Mishna et al, 2015; Rivera-Rodriguez et al, 2012; Shakil & Hazela, 2016). Furthermore, their study has been conducted to promote the effectiveness in reducing aggressive behaviour in adolescence which is determined by impact of online communication through mobile phone short message services SMS (Rajabi et al., 2012). The application of SMS and mobile based implementation has brought about positive effect towards reducing those who are addicted to smoking (Stead et al, 2013; Tseng et al, 2016).

A similar study was conducted to make students' privacy more secured and more comfortable using application on mobile devices (Gibson & Cartwright, 2014) and to establish a virtual relationship through email basis approach in delivering the text based confirmation and reinforcement (Salleh et al., 2015). However, there is still barriers in terms of certain based area where the this is a limit (Stifel et al., 2012). Moreover, the video call based counselling was also developed to promote the counselling with communication skills implemented using online interactive video modules in clinical skills (Wagner, Pfeiffer, & Harrington, 2011). This application seems to have enabled the client with a distinction of using specific content and e access.

2.3 Benefit and Factor to Use Online and Mobile Communication

With the proliferation of digital technology, cyber application has shown positive results which include faster and more effective communication process. Internet communication definitely saves time because lecturers are not expected to meet students face-to-face. Also, information dissemination to students covers wider range than the existing traditional method. Cyber counselling offers a new opportunity for advisors and students to generate an active learning session outside the classroom. Using mobile technology showed positive improvements physical activity. The advantage of virtual learning made it easy for course coordinator to advise wider range of students as individual meeting has been found to be time consuming. Aside that, cyber counselling can reduce the overhead as a counsellor can cyber counsel multiple students at the same time. It also helps in terms of getting insight to the users' in form of additional experience and also number of information can be assessed directly from the sources (Miftah, 2013).

In particular, the cyber counselling could offer a new opportunity for advisors and students to generate an active counselling session outside the classroom (Blissenden et al, 2012). The benefits can also be enhanced seemingly to

improve the positive counselling activity and the improvement to the individual students through the counselling service (Vervey et al., 2016). Furthermore, the benefit can also be visible with such proposed mobile course coordinator system using mobile phone in assisting the subject module of study amongst the students by keeping track of their courses anytime and anywhere (Lee et al., 2011). Moreover, the contribution can also be viewed in innovative teaching to deliver the learning process with big data approach (Huda et al., 2016). This initiative has been also transmitted into the mobile learning management system (LMS) (Anshari et al., 2016). In addition, LMS associated with online student academic achievements would enable in filling the students' need of learning (Han & Shin, 2016). In previous studies, proposed a mobile course coordinator system integrated and accessible on mobile phone. This was to aid students in choosing the necessary courses to undertake in their various fields of study. Similarly, students were able to keep track of their courses by using their cell phones, anytime and anywhere.

Recent technological advancement in wireless technology has made possible learning on the move. Educational stakeholders such as school administrators, teachers, and learning tool developers have encouraged the use of mobile learning management systems to cater to students' needs. Explained further that there is obvious potentials inherent in mobile technology such as increasing patient adherence to medication, allowing therapists to monitor clients' progress, improving the therapeutic relationship, and providing information to both clients and therapists.

Mobile learning existence can be used to improve education and facilitate student to easily access to the content regardless of their location. Another similar potential benefit can also be seen across mobile technology application which assisted to provide access to counselling in increasing patient's adherence to the medication rules and also to help them get counselling by making a control with monitoring students' progress improving the counselling relationship, and providing information to both students and advisor (Norris, Swartz, & Tomlinson, 2013). There is also an illustrated contribution to signify the particular essence using mobile learning existence to improve education and facilitate student to easily access the content regardless of their location (Almatari, Iahad, & Balaid, 2013).

3 METHODOLOGY

To design the proposed system, the framework for the Application of System Thinking (FAST) methodology is used. It is a standard process or methodology used to develop and maintain the information systems. The methodology provides a quick and reliable process with the best quality output of the Information System result (Zain, 2008). FAST methodology consists of 8 phases which are Scope definition, Problem analysis, Requirements analysis, Logical design, Decision analysis, Physical design, Construction and testing, and Installation and delivery (Bardadi, Firdaus, & Firdaus, 2010). However,

in this study, it will focus specifically on the 3 main phases to achieve the project outcomes, as follows.

- In the problem analysis, researcher analyse the problem using Ishikawa Diagram. Data is often by distributed into the questionnaire to obtain the feedback.
- In the logical design, researcher used object oriented approach which consists of the use case diagram, sequence diagrams, activity diagrams and class diagram.
- In the physical design, researcher will describe the design of user interface of the proposed system.

The following section presents the explanation of each, the three phases and presents the design of the proposed mobile academic cyber.

4 ANALYSIS AND DISCUSSION

4.1 Problem Analysis

In the problem analysis phase, researcher used 'Ishikawa' diagram to analyse the problem that arise in the existing system. Ishikawa diagram is a diagram that shows, the shape and arrangement makes it well known as the Fishbone Diagram. There are two sides of this diagram, namely the fish head and the fish bones. The fish head contains the core of the problem and the fish bone itself contains why the problem is happening based on the research or brainstorming session (Wong, 2011).

The figure 1 to figure 3 indicate that problem faced on the existing system not only causes of less of student motivation. But there are other causes such as, the system have not provide the integration data yet and also did not compulsory to make documentation progress where needed for advisor to monitoring further away. The rules of applying this counselling design should be made into the schedule which is taken early between students and advisors. In further, this would have an inextricable impact related to the counselling consistency in terms of time commitment and schedule arrangement. As a result, the outcome here refers to the way which can be transmitted to generate the counselling process. However, the boundaries of this design would be no record during the counselling process and thus it would be challenges to see the counselling record. With this regard, it is necessary to facilitate a platform to gather in checking the data from counselling process. Moreover, the subsequent challenge is the internal factor which is no further consolidation from the advisor with providing the report made in every semester and then, the system will alert the signal notification to solve it. In particular, an attempt to strengthen the inner state of awareness towards advisor's responsibility is worthwhile to concisely point out their suggestion and advice for their students frequently to make the process active.

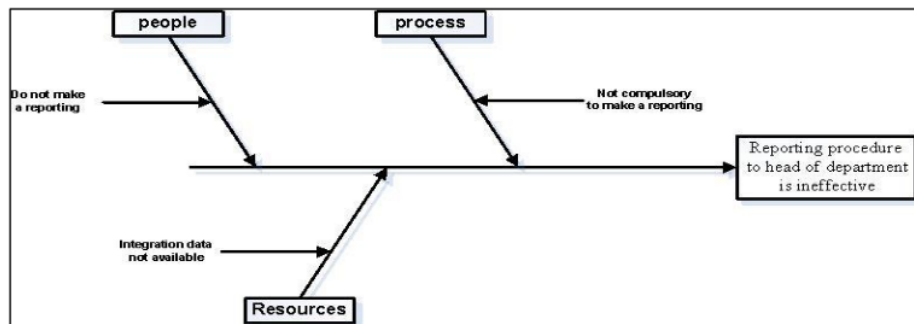


Figure 1: Ishikawa Diagram for Inconsistent activity

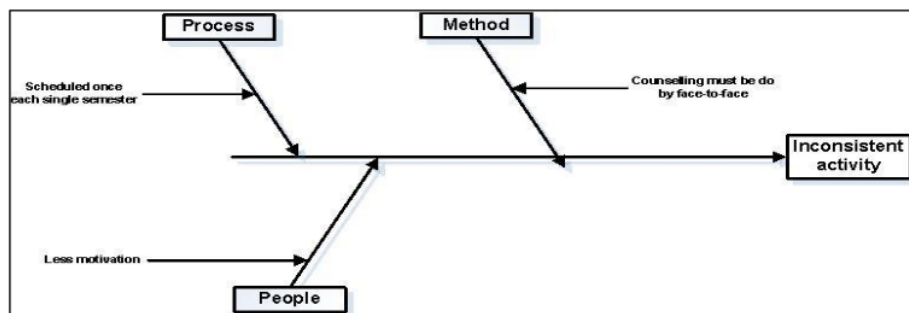


Figure 2: Difficulties for Advisor to monitor students

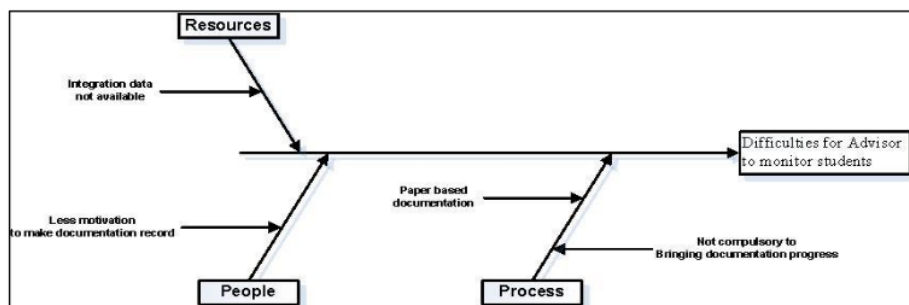


Figure 3: Ishikawa Diagram for reporting procedure to head of department is ineffective

4.2 Logical Design

Logical design is a phase to transform the requirement analysis into design illustration. Object oriented (OO) approach is used in the logical design phase. In this research, The Unified Modelling Language (UML) technique which is a graphic language for specifying, visualizing, constructing, and documenting information systems was used to implement in a variety of models with a specific extensions to expand the application. With such features, UML was employed through various types which present a high level of generalization and extensions that expand its applications (Santos et al, 2013). This UML will elucidate four core stages to enhance the logical design, namely use case diagram, activity diagrams, sequence diagrams, and class diagram.

4.2.1 Use case diagram

UML use case is the extent of representation which refers to the behaviour diagrams between the user and the different use cases used to describe a set of actions which some system should perform a sequence of actions in providing something in collaboration with one or more external users of the system is drawn as a horizontal ellipse (actors) (Dobing & Parsons, 2006). It has been widely exerted to provide the signal for identifying and modelling of the context by observing what kind of certain level and stage of the problem domain. Moreover, viewing the scope and elements here refers also to the system requirements modelling (Misbahuddin & Alshayeb, 2015). It enhances the set of tasks which would be generated with the system to generate the impact to lead to use in business sector to enable them interact with between user and system (Li, Liu, & Jifeng, 2004). Figure 4 will illustrated the use case diagram of system proposed. Table 1 and 2 provide the use case diagram description

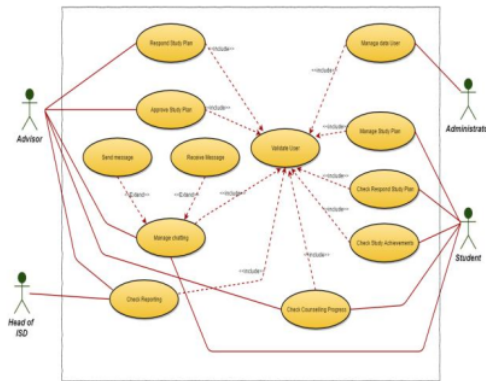


Figure 4: Use case diagram of Mobile Academic Cyber Counselling

Table 1: Description of actor

Actor	Description
Advisor	Lecturers in the department society who have a duty to be the academic advisor for students
Student	Students in the department society
Head of department IS	Head of department Information system
Administrator	Staff department who have responsible to managing the user data

Table 2: Description of use case

Use case	Description
Validate user	To validate user on login process
Manage data user	To manage import-export user data
Manage study plan	To provide student the optional of management study plan
Check respond study plan	To displaying advisor respond of academic study plan (KRS)
Check study achievements	To displaying the study achievements have been passed
Check progress	To displaying the progress
Respond study plan	To provide a tool for advisor to manage a respond for students (KRS)
Approve study plan	To provide a tool for advisor to approve (KRS)
Manage chatting	To manage the chatting included sending and receive message
Check reporting	To display the reporting of academic

4.2.2 Activity diagrams

As the graphical visualization to describe dynamic aspects of the system, activity diagram is considered as a flow chart to represent the flow form in the workflows with stepwise activities and actions (Bastos, & Ruiz, 2002). To achieve this support for the option the activity can be described as an operation of the system generated with iteration and concurrency. In UML, an activity diagram is used to display the sequence of activities. Activity diagrams show the workflow from a start point to use such as in business process, in which this is utilised a process of computational and organizational activity. By facilitating the representation of the interaction flow indicated for the modelling of many decision paths in the progression of events with a high level of abstraction, activity diagrams of UML is conceived to provide situations in detail where the execution of some activities is using the parallel processing (Santos et al., 2013).

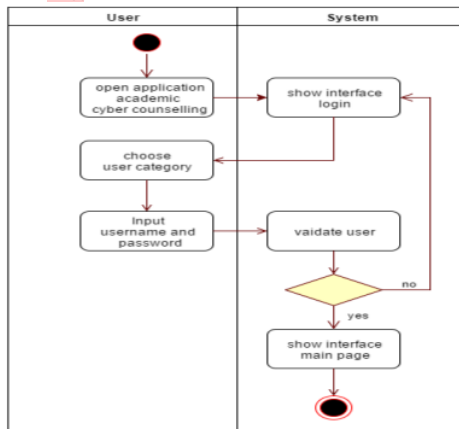


Figure 5: Diagram process for validate user

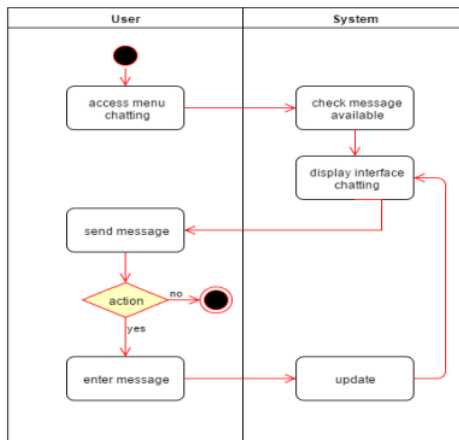


Figure 6: Diagram design for managing the chatting

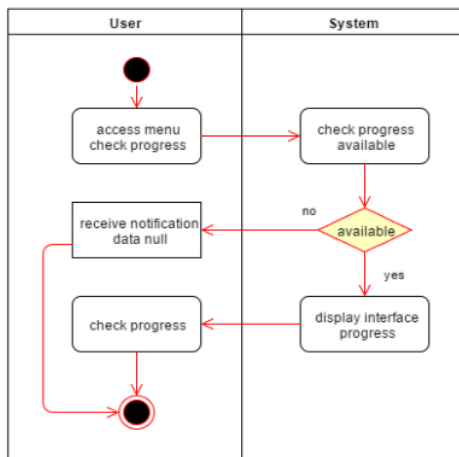


Figure 7: Diagram process for checking the progress

Based on figure 5 to figure 7, can identify the system requirements such as:

1. The system should display user category for login authentication.
2. The system must verify the correcting user to login.
3. The system, after the menu selection by user should display the interface of Login, chatting, and progress.
4. The system should provide the functional of send or receive message on managing chatting interface.
5. The system must provide the real time process to update database.
6. The system should provide the integration data for users

4.2.3 Sequence diagrams

Sequence diagrams are used to present the dynamic behaviour of system design while class diagrams are system static structure. As one of two kinds of UML interaction diagrams, a sequence diagram shows interactions between objects arranged in a time sequence (Li et al., 2004).

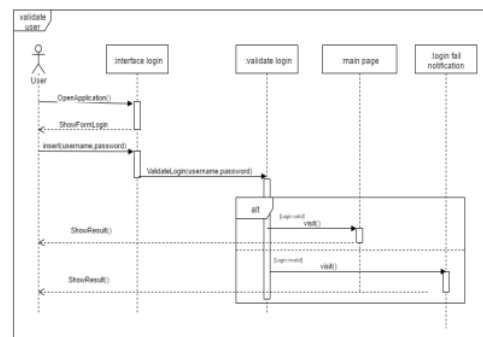


Figure 8: Subsequent diagram for user validation

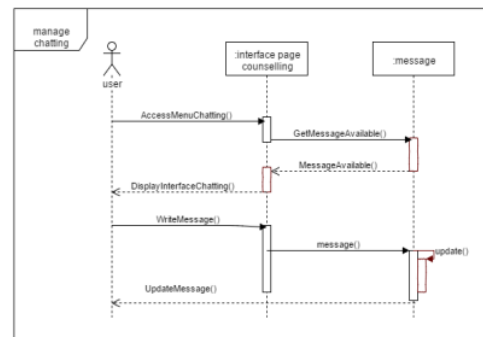


Figure 9: Subsequent diagram for managing the chatting

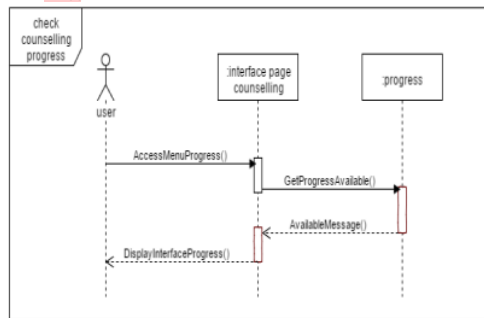


Figure 10: Subsequent diagram for checking the progress

This stage as illustrated by the figure 8. This process begins with validating the users by putting user name and password. The classValidateLogin would be transformed into the authentication process. This can be enhanced through fitting the data from the input available on the database. If that valid, the process system would transfer directly to the page on main menu. This attainment would be also failed when login application unsuccessful.

4.2.4 Class diagram

Class diagram consists of various classes and relationships with each other. In its first portion, class diagram consist of its name, in the second portion it consists of attributes and in third it consists of operations. For the connection of class diagram, the relationship exists between the different classes. To represent the relationship between super class and subclass, the generalization relationship takes place in the static part of the UML model, UML class diagram exists to analyse the complexity of the software system(Shakil& Hazela, 2016)

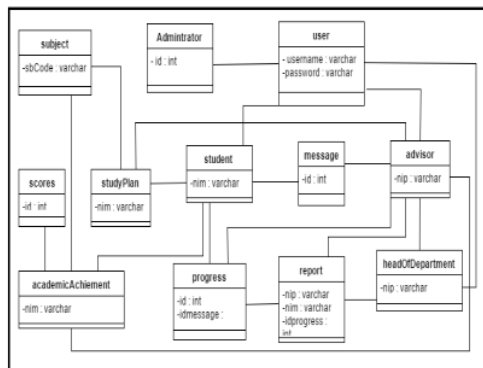


Figure 11: Class diagram of proposed system

Based on above figure, the process starts from the relation amongst the class illustrated in detail towards the use case diagram and sequence diagram. With regard to the system proposed above, there are three core users such student, advisor, and head of department. In line with the subsequent process, the stage should be transformed into the study achievement stage where the users have chance to simultaneously relate to the procedural context to the head of department program.

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4.3 Physical Design

Figure 10 below shows that

1. Login user interface (UI) for each user above is similar. Although similar UI, user is necessary to select the equal of user category.
2. The button "Reset password" on the bottom of UI login is used when the user forgot their password.
3. On the main page of student, there are display the profile of student and their advisor.
4. On the page of manage chatting, there are display UI to send a message and also display the messages have received.
5. Progress is providing on the page of "cyber progress".

There is needed to further analyse the significance and effectiveness of this model framework in higher education (HE). The outstanding expectation will be achieved through developing the mobile application of academic cyber.

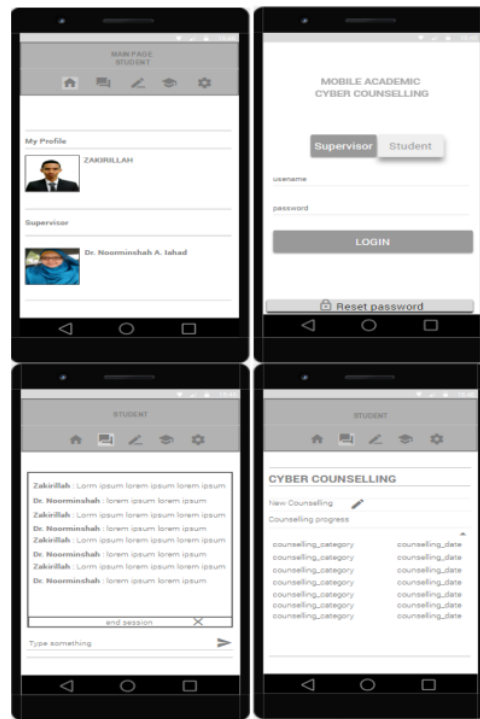


Figure 10: User Interface design of proposed system

5 CONCLUSION

This paper did elaborate on the design of mobile application design for academic counselling. This is to promote the further analysis on the process would be transformed in the process of academic counselling. Designed in the context of higher education (HE), the outstanding expectation will be achieved through

developing the mobile application of academic cyber counselling. This study will contribute to propose a design of academic cyber through mobile device where this aims to help students to solve their academic issues, such as reflecting the learning achievement. The proposed design would promote the improvement process held in HE, especially amongst students and faculty society at Universitas Sriwijaya(UNSRI), Indonesia. Moreover, the target focus is also to promote a better communication among students and advisors. Moreover, the further investigation would be conducted to point out the process of implementation level to see how it can be generated seemingly in the academic counselling application system. In further, the subsequent study is to assess this application amongst the users in HE to see the effectiveness and significance of the proposed application system.

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AUTHOR PROFILES:

Zakirillah is an undergraduate student at the Information System department, Faculty of Computer Science, Universitas Sriwijaya, Indonesia. Currently, He has initial research experience through a Research Internship Programme at the Faculty of Computing, Universiti Teknologi Malaysia (UTM). His research interests focus on Mobile Computing and Knowledge Management.

Noorminshah A. Iahad is a senior lecturer at the Information Systems Department, Faculty of Computing, Universiti Teknologi Malaysia (UTM). She received her PhD degree at the Universiti of Manchester, United Kingdom. Her research interests focus on Cloud Computing in education and for SMEs, Computer Supported Collaborative Learning, and usage of mobile applications for health monitoring and management. She has graduated seven PhD students and three Masters research students. She is a member of the Association for Information Systems and she is one of the Editors of the International Journal of Social Networking and Virtual Communities.

Miftachul Huda is a researcher at Faculty of Islamic Civilisation, Universiti Teknologi Malaysia. His research interest includes the field of educational studies, mainly moral, Islamic and multicultural education, and learning theory and adaptive teaching and learning technology. He has been experienced in working on research for more than five years. Contributing several works, he is currently the member of the advisory editorial board in some international journals both in Indonesia and overseas. Thus, he commits to contributing his knowledge to the benefit of society through professional and social activities.

Fathoni is a lecturer at the Information Systems department, Faculty of Computer Science, Universitas Sriwijaya. His research interests focus on Information Systems Management.

Rahmat Izwan Heroza is a lecturer at the Information System department, Faculty of Computer Science, Universitas Sriwijaya. His research interests focus

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