

IOS SAFETY APPLICATION FOR UITM

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Abstract

This paper presents an iOS application, which is developed, to ensure that every task related to safety and health such as inspection, deviation analysis and accident reporting becomes more simple and easier. Normally, these three (3) tasks are done separately and the data are saved in different ways. These situations make the tasks become complicated and consume a lot of time. Therefore, this application is developed to overcome all the problems that occurred. The main objective of this application is to allow the user to handle inspection checklist, deviation analysis and accident reporting efficiently by using iOS devices such as iPhone and iPad. Hence, using iOS device, instead of using a lot of paper, can do all the tasks. Using Xcode SDK, which is the software that is used to develop iOS application, developed this application. Xcode use Objective-C as the programming language, which is quite similar with other programming languages such as C and C++. The final result of this project is that this application can handle all the three (3) tasks and the form or the findings can be emailed to the Safety and Health Officer (SHO). This application will reduce time consume to conduct safety inspection, deviation and reporting tasks as well as avoid delay that might happen while using the traditional method.

Keywords: Safety and Health, Inspection Analysis, Deviation Analysis, Accident Reporting, Xcode, Objective-C.

1. Introduction

Occupational Safety and Health (OSH) is concerned to secure safety, health and welfare among worker and to protect others against risks to safety or health in

connection with the activities at workplace. OSH is also concerned with preventing harm from any incidental hazards, arising in the workplace. There are five categories of hazard that usually exists in workplace which are physical, chemical, biological, ergonomic and psychosocial hazard [1-3].

Occupational Safety and Health Act 1994 (Act 514) has been gazette on 25 February 1994 by Malaysia Parliament to protect worker, who are doing work that involves risks to safety or health at workplace. Normally, there are three aspects that are very important in the Occupational Safety and Health which are inspection checklist, deviation analysis and accident reporting [4].

A safety inspection is a documented procedure that is handled by Safety and Health Officer (SHO) to identify potential hazards especially in workplaces. There are many types of safety inspections such as checking vehicle safety, inspect industrial plants and identify hazards in office buildings. The safety inspections usually involve a checklist which helps SHO assess each area of concern and record the findings of the inspection [5-6].

Deviation is referred as failures to obey the good practices at the workplace that conform the organizational procedures and safety standards. The deviation analysis is important in order to prevent an accident from occurred such as by ensuring personal protective equipment is being used in workplaces according to regulations. It is because some of the workplaces may be exposed to hazards. Basically, deviation analysis covers the type of deviation and how much the situation occurred at the workplace [7].

For the accident reporting, the report usually consists of the accident details such as the date, time and location of the accident. Besides that, a brief description of the nature of the accident is also required for recording purpose. From the information provided in the report, investigation of the accidents and possible causes can be done to prevent similar incidents to occur again [7-8].

The tasks that are related to OSH usually consume a lot of time. For example, the accident report must be written on the standard paper form before it can be sent to the authorized safety person such as the Safety and Health Officer, who records the report into the system, while for the deviation analysis, the data of the analysis must be written on the inspection checklist form before it can record by using Microsoft Excel. This situation can cause delay in submitting the form. Besides that, the traditional method consumes a lot of paper. For the inspection checklist itself it can consume about two to three paper per day. This situation also can cause difficulties in retrieving them back for analysing purpose [9].

This project is done to improve the safety and health of employer and employee in workplaces. This improvement can make a better working environment and every work can be done with full commitment. This is because any accident or injury can be prevented and can lead to excellence in work performance [10-12].

The main objective of this project is to develop a safety and health iOS application that is more efficient and user friendly. This application is developed to make sure that the related tasks can be done easily but in the same time is more reliable.

The development of this project was focused on software part as most of the work must be done by programming. The software that was used is Xcode SDK

which is specialized in developing iOS application. The programming language used in Xcode is Objective-C. The completely developed application which can make inspection checklist, deviation analysis and accident reporting task can be transferred into iOS devices when all the programming are finished and can be built successfully [13].

2.Methodology

The application was developed by using Xcod software. This software must be downloaded from App Store for free before it can be used. Basically, Xcode is used to develop iOS application. Objective-C is the programming language that is used in Xcode which is quite similar with other programming languages such as C and C++. For developing this application, the Xcode used is the 6.2 version.



Fig. 1. Xcode 6.2 Version

Xcode use the concept of storyboard for the programmer to design the interfaces or layout of the application. Each layout used for this application is called a view controller. The view controller can be designed by adding interactive item such as button and text field that can be used by the user when using the application.

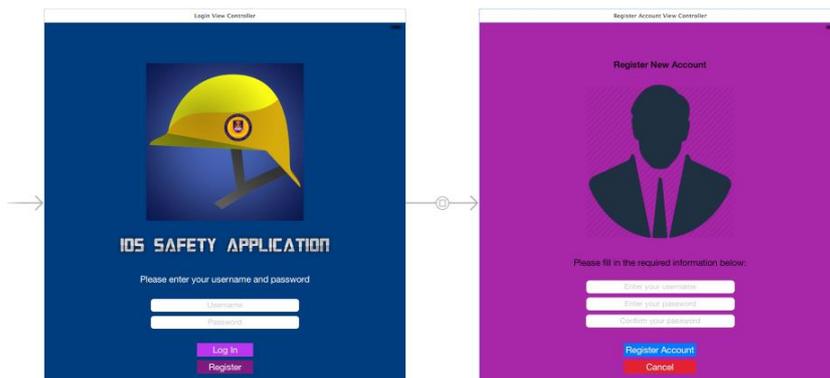


Fig. 2. Xcode Storyboard.

There are two (2) type of files need to be assigned to each view controller make sure that the layout can be functioning. The files are called header file (.h file) and implementation file (.m file). For the first view controller, both files are already assigned by default but for the next view controller the programmer must assigned them manually.

Each file has its own function. The header file is used to define any item used by the programmer in the view controller. For example, when the programmer added a text field in the view controller, he or she must define the text field in the header file and link it to the button in the view controller. The situation is different for the implementation file where it is used by writing coding in the file to make sure that the item defined in header file can be functioning well like when the user pushes the button a graph will be plotted.

Besides that, the view controller can be linked to each other by using storyboard segue. There are four (4) main type of segue that are available in Xcode but for this application the mostly used segue is the present modally and show segue. The present modally segue is normally used to link button to another view controller so that the user can go to another layout by pushing the button while the show segue is used with the navigation controller.

Xcode also provides iOS device simulator for the programmer to use for simulation of the developed application. The simulator is very important because it can be used for testing and debugging the coding that have been written. The programmer can choose to run the simulation in any iOS device such as iPad or iPhone. The simulator allows the programmer to test the coding like testing it in the actual devices.

3.Results and Discussion

The final result of this project is that this application can be installed in iPad and it is completely covered all the three sections which are the inspection checklist, deviation analysis and accident report. When the user opens the application, the first layout, which is the login page, will be shown. User needs to fill in the username and password to log in into the application. When the user entered the wrong username or password, a pop up window will appear to inform the user that the login is failed.

If the user is a new user, he or she must register the account first by clicking the 'Register' button and fill in the all the details required which are the username, password and confirm password. After that, the user must click the 'Register Account' button to confirm the registration or click the 'Cancel' button to cancel the registration. After the login is successful, user will be directed to the main menu of the application. From this page, user can choose which task that they want to do whether inspection, deviation or reporting. Besides that, user also can log out from the application in this page by clicking the 'Log Out' button.



Fig. 3. Login Page.

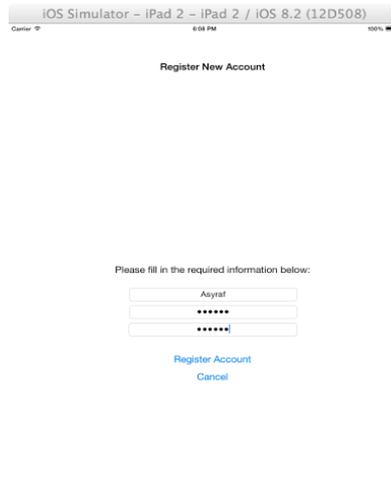


Fig. 4. Register New Account Page.

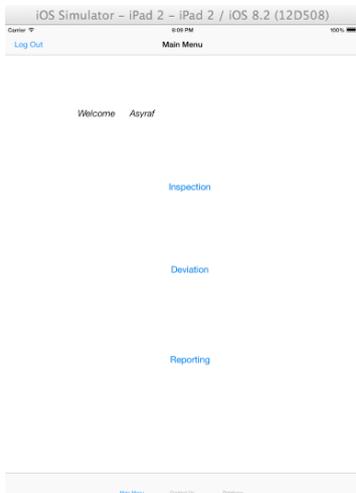


Fig. 5. Main Menu of the Application.

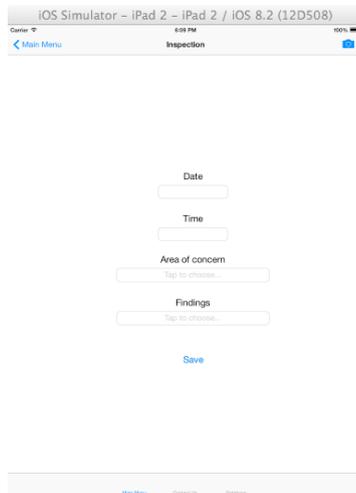


Fig. 6. Inspection Checklist Page.

For the inspection checklist, the user is needed to fill in the inspection details, which are date, time, and area of concern and findings of the inspection. For the area of concern and findings, user can make the selection from the list that has been provided in the down picker. The completed inspection details are then can be saved as picture by using screenshot feature by clicking the ‘Save’ button.

In the deviation analysis section, user need to key in input for each category of the deviation in number value. From the value of the input, graph can be plotted by clicking the ‘Plot Graph’ button to show the result of the findings. The completed form also can be saved by clicking the ‘Save’ button like the inspection checklist page. The third section is the accident reporting which is used to make report of any accident that occurred in UiTM. User is required to

complete all the details of the accident such as name of the injured person and location of the accident. The completed form then can be saved in picture format.

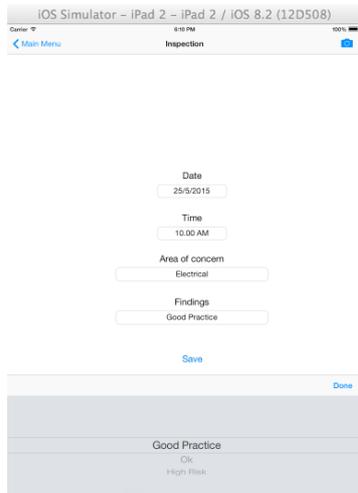


Fig. 7. List of Selection for the User to Choose from the Down Picker



Fig. 8. Deviation Analysis Page.

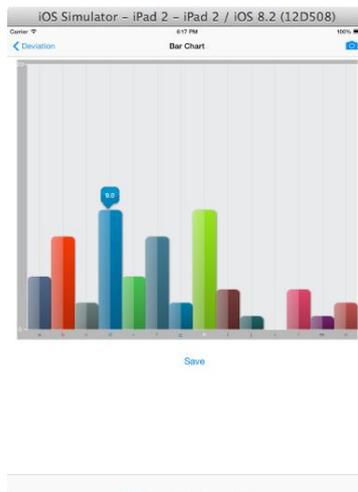


Fig. 9. Bar Chart Plotted.

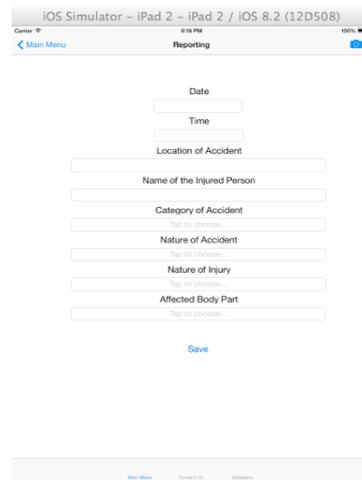


Fig. 10. Accident Reporting Page.

For each task that has been done, user can take photo as evidence by clicking the ‘Take Photo’ button. User will be directed to the take photo page where the user can choose to take a new photo or choose from the existing picture that has been taken before. Besides that, user can get the exact location of any task done by clicking ‘Get Location’ button and the location can be located by using the Global Positioning System (GPS) feature.



Fig. 11. Take Photo Page.



Fig. 12. . Email Page.

All of the form or picture that has been saved can be loaded in the database page before it can be sent to the Safety and Health Officer via email. To load the picture, user is needed to click the ‘Attachment’ button and choose the picture from the gallery. After the picture is loaded in the database, user can send it via email by clicking the ‘Email’ button. Besides that, user can contact the safety officer by clicking the ‘Contact Us’ button located at the bottom of the application page. From this page user can call, sms or email the safety officer. User can also view the Faculty Electrical Engineering website or view the developers profile by clicking the ‘Developers’ button to get information about the developers such as email and contact number of the developers.

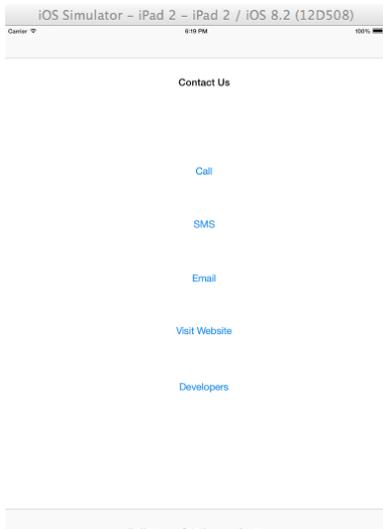


Fig. 13. Contact Us Page.



Fig. 14. Developers Information.

4. Conclusion

This application has been developed successfully which cover all the three (3) tasks which are inspection checklist, deviation analysis and accident reporting. The development of this application will improve a lot of things that is related to safety and health aspects especially in places like universities and workplaces. By using this application, user can handle any task related to safety and health by using iOS device only instead of using a lot of paper. This situation will prevent difficulties in retrieving them back for analysing purpose. Besides that, the time consuming when doing these tasks can be reduced. The delay in submitting the findings or report also can be avoided. Therefore, all the related tasks can be done efficiently and become more reliable.

5. Results and Discussion

This application is basically developed for the use on iOS devices only. For further improvement, this application also must be compatible for Android devices. This is to make sure that it will be available to all smartphone users so that the number of user of this application will increase.

6. Conclusions

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