STAFF PAYROLL USING IMAGE CAPTURE AND GPS LOCATION (SPICG)

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I hereby declare that I have read this project and in my opinion this project is sufficient in terms of scope and quality for the award of the degree of Bachelor of Computer Science (Computer Systems & Networking) with Honours.

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I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

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STAFF PAYROLL USING IMAGE CAPTURE AND GPS LOCATION

(SPICG)

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Thesis submitted in fulfillment of the requirements
for the award of the degree of
Bachelor of Computer Science (Computer Systems & Networking) with honours

Faculty of Computer System and Software Engineering

UNIVERSITI MALAYSIA PAHANG

MAY 2019
ACKNOWLEDGEMENTS

Firstly, I would like to thank the God for being with me and helping me throughout this project. I would like to take this opportunity to express my grateful appreciation to all the wonderful peoples who have continuously giving me support, advice and knowledge towards the successful completion of this Final Year Project for my undergraduate course.

I also like to wish my sincere appreciation to my supervisor, Dr Nor Bakiah Binti Abd Warif for the encouragement, guidance, patience, advice, suggestion and motivation on developing this project.

Last but not least, I also like to thank and appreciate to my friends and family who had helped me in generating ideas and guide me throughout the whole year. Finally, I would like to express my sincerest thankfulness to my families for their love, support and encouragement that they had given to me to succeed my final year project.
ABSTRAK

ABSTRACT

The usage of technology as business solution is becoming very common which we can see that many organization nowadays make use of technology in their organization. However, there are few organization, especially whom with small budget still using manual paper system to keep track their staff attendance. Unfortunately, the staffs’ salary are calculated based on the handwritten paper record. Due to the reasons that manual system is time consuming and always inaccurate, this project proposed a mobile application attendance with image capture and GPS location named as Staff payroll with Image capture and GPS location (SPICG). This mobile application will authenticate the attendance using image capture and record the staffs’ attendance by locating their position using GPS location. Based on the attendance, the employer will calculate the staff’s payroll. In addition, this project also providing a feature for them to fill in the organization’s sales. Thus, this application can help organization to eliminate the error and prevent fraud attendance by the staffs while improving the processing time.
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CHAPTER 1

INTRODUCTION

1.1 Introduction

The impact of technology on the business can be seen as it’s provides a wide range of tools for entrepreneurs to guide companies through the start-up and growth stages. In this century, it’s almost seems like impossible to run a business without technology. However, some small organization still hesitate to get the help of technology instead still applying the manual system. The hesitation might be due to lack of exposure toward the latest technology updates or problems on budget. Therefore, they decided to use manual paper system to keep track their staff attendance while the staffs’ salary are calculated based on those handwritten paper record. Manual calculation for the payment management cannot be accurate all the time and this will delay the payment of salary. Furthermore, by using the paper record there is a high possible of fake staff attendance. This indirectly leads to staff’s job satisfaction that can affect the business as well.

This project proposed a mobile application attendance with image capture and gps location named as Staff Payroll using Image capture and GPS location (SPICG) designed especially for the organization with small budget. SPICG will help the small organization to manage the salary allocation and monitoring the staff attendance by using Image capture and GPS location. By using SPICG, the staff payroll will be efficiently managed while the image capture and GPS location is created to authenticate the staff login. The image capture can ensure the correct person login into the system whereas GPS location is helping to verify the staff login with exact location. This mobile application will be helpful for the employer to check and allocate salary for the staff instead of using manual calculation.
Once staff login into SPICG, a page that ask them to capture image and trace staff location will be displayed. The information will then be saved into a database to automatically calculate their salary for the current month. SPICG will play a major and vital role to keep the attendance records neatly. The employer will have primary control over the application where they can register staff, and manage their salary.

Finally, this mobile application will be a good solution for the organization whom using manual system to calculate their staffs’ salary. This application will convert the manual information into computerized data which is easy to be managed. This can be a stepping stone for the small organization business to look for more technology usage and learn how to utilize it to improve business as well.
1.2 Problem statement

First, time consume is the main factor that lead to this solution. Employer might take a long time to calculate staff salary. It’s also increased the need for manual labour which is prone to human errors and slow the speed of performing attendance task easily. This might be a reason why the staff’s salary credited late into the account.

The next problem is manual attendance and manual payroll system. By using the manual system, employer faces difficulty in managing a lot of problem such as high possible of paper missing, lost data and etc. In order to record all the staff’s payroll management, more papers are needed to write all payroll details. This makes it more difficult to manage the attendance and also contribute to waste of natural resources.

Another problem facing by the employer with using the manual system is fake attendance of staff. When the employer going out station for business purposes, the owner wouldn’t know what happens in the shop. So that, the staff may use this chance to take illegal leave as not going to the shop but put the attendances by help of another staff. This may lead insufficient staffs at the shop and it may impact the shop with customer loss.
REFERENCES


Firebase Authentication: Android Users | Pluralsight. (n.d.). Retrieved May 1, 2019, from https://www.pluralsight.com/courses/android-firebase-email-authentication-verification?gclid=Cj0KCQjwh6XmBRDRARIsAKNI1DFlgebwICF69NiWmn596fRB9FQJkyNne81vCWhTU2TR3AtRmmI7U4aApPZEALw_wcB&ef_id=Cj0KCQjwh6XmBRDRARIsAKNI1DFlgebwICF69NiWmn596fRB9FQJkyNne81vC

How To Get GPS Location In Android - YouTube. (n.d.). Retrieved May 1, 2019, from https://www.youtube.com/watch?v=QNb_3QKSmMk


