

SMKDIY ATTENDANCE MANAGEMENT SYSTEM WITH SMS SERVICE

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2013

## ABSTRACT

SMKDIY Attendance Management System with SMS Service (SMKDIY AMSSS) is build to facilitate the attendance management system in Sekolah Menengah Kebangsaan Dato' Ibrahim Yaacob (SMKDIY) that are still using manual system. Manual attendance system left a lot of holes in effectiveness. Missing records, papers consumption and tardy reports are some of the obvious one. Student's truancy is one of the indirect results from the current system. Hence, this system existed to convert all the manual system to a computerize one. Other than that the system also can provide SMS alert and generate informative reports for school monitoring. Prototype model is used for the development of the system as the model can elicit user's requirements faster, and can detect defects earlier thus reducing the time and cost. For the development PHP language is used, and for the database is mySQL. Meanwhile for the hardware, Adobe Dreamweaver CS4 and Android SDK are employed for the web based and mobile based system. After completion, the system consists of a web based, a mobile application and SMS services. It is successfully used to facilitate attendance management by making the process faster, easier date retrieval and also ease the usage of paper in the office.

## TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	<b>DECLARATION</b>	ii
	<b>ACKNOWLEDGEMENT</b>	iii
	<b>EXECUTIVE SUMMARY</b>	iv
	<b>TABLE OF CONTENT</b>	v-vi
	<b>LIST OF TABLE</b>	vii
	<b>LIST OF FIGURE</b>	viii
	<b>LIST OF ACRONYMS / ABBREVIATION / GLOSSARY</b>	ix
<b>1</b>	<b>INTRODUCTION</b>	
	1.1 Introduction	1
	1.1.1 Problem Statement	1
	1.1.2 Objective	2
	1.1.3 Scope	2
	1.2 Review Previous Work	3
	1.2.1 Smart School	3
	1.2.2 SmartX	4
	1.2.3 Smart Suite	5
	1.2.4 AMIZONER	6
	1.2.5 Attendance Tracker	8
	1.2.6 Attendance	9
	1.2.7 Simple Weather Alert	11
	1.2.8 InviteWiz	12
	1.2.9 Attendance Tracker	13
	1.2.10 Advantages and Disadvantages of Previous Work	14 15
	1.3 Current System and Limitations	16
	1.4 Methodology	17
	1.4.1 Requirement Gathering	18
	1.4.2 Quick Design	18
	1.4.3 Client Evaluation	19
	1.4.4 Refined End Functionality	19
	1.5 Report Organization	
<b>2</b>	<b>SOFTWARE REQUIREMENT SPECIFICATION (SRS)</b>	20
	2.1 Product Description	20
	2.1.1 Product Perspective	22
	2.1.2 Product Functions	23
	2.1.3 User Characteristic	24
	2.1.4 Constraints	24
	2.2 Interface Requirement	24
	2.2.1 User Interface	24
	2.2.2 Hardware Interface	25
	2.2.3 Software Interface	25
	2.3 Software Product Features	25

	2.3.1 Use Case Log In	27
	2.3.2 Use Case Manage Attendance	28
	2.3.3 Use Case Manage Data	31
	2.3.4 Use Case Search Data	33
	2.3.5 Use Case Generate Report	36
	2.4 Requirement Traceability	
<b>3</b>	<b>SOFTWARE DESIGN DESCRIPTION (SDD)</b>	
	3.1 System Overview	38
	3.1.1 Context Diagram	38
	3.1.2 Architecture Design	39
	3.2 System State	44
	3.3 System Design Description	45
	3.3.1 System Design	45
	3.3.2 Detailed Design	47
	3.3.3 Database Design	80
<b>4</b>	<b>IMPLEMENTATION</b>	
	4.1 Introduction	83
	4.2 System Development	84
	4.3 System Flowchart	88
	4.4 Weakness, Strength and Challenge	89
<b>5</b>	<b>RESULT AND DISCUSSION</b>	
	5.1 Introduction	90
	5.2 Limitation of Project	91
	5.2.1 Development Constraint	91
	5.2.2 System Constraint	92
	5.3 Advantage of System	93
<b>6</b>	<b>CONCLUSION</b>	
	6.1 Conclusion	83
	6.2 Future Works	84
	<b>REFERENCES</b>	85
<b>APPENDIX</b>	APPENDIX A – Gantt Chart	86
<b>APPENDIX</b>	APPENDIX B - Sequence Diagram	88
<b>APPENDIX</b>	APPENDIX C – Sign Off Form	101
<b>APPENDIX</b>	APPENDIX D – GUI	103

## LIST OF TABLES

TABLE NO	TITLE	PAGE
1.1	Pros and Cons between Previous Works	15
1.2	Information that need to be gathered	17
2.1	User Characteristic	23
2.2	Use Case Log In	25
2.3	Use Case Manage Attendance	27
2.4	Use Case Manage Data	28
2.5	Use Case Search Data	31
2.6	Use Case Generate Report	33
3.1	Local Data Definition for stdName	49
3.2	Local Data Definition for stdClass	49
3.3	Local Data Definition for stdPNum	49
3.4	Local Data Definition for stdDetail	50
3.5	Local Data Definition for stdName	57
3.6	Local Data Definition for stdClass	57
3.7	Local Data Definition for date	58
3.8	Local Data Definition for month	58
3.9	Local Data Definition for year	58
3.10	Local Data Definition for stdName	66
3.11	Local Data Definition for stdClass	66
3.12	Local Data Definition for tchName	72
3.13	Local Data Definition for className	72
3.14	Local Data Definition for classSize	72
3.15	Local Data Definition for absentStd	73
3.16	Local Data Definition for presentStd	73
3.17	Local Data Definition for date	74
3.18	Database For Teacher's Log In	80
3.19	Database For Clerk's Log In	81
3.20	Database For Student's Data	81
3.21	Database For Attendance's Data	82

## LIST OF FIGURES

<b>FIGURE NO</b>	<b>TITLE</b>	<b>PAGE</b>
1.1	Smart School Main Interface	3
1.2	SmartX Apply for Leave Interface	4
1.3	SmartSuite Login Form	5
1.4	AMIZONER Homepage	6
1.5	Attendance Tracker Homepage	8
1.6	Attendance Record Page	9
1.7	Simple Weather Alert Warning Page	11
1.8	InviteWiz Homepage	12
1.9	Attendance Tracker Event Page	13
1.10	Repeated Steps Of Prototyping Model	16
2.1	SMKDIY AMSSS Context Diagram	21
2.2	SMKDIY AMSSS Use Case Diagram	22
2.3	Login Use Case Diagram	25
2.4	Manage Attendance Use Case Diagram	27
2.5	Manage Data Use Case Diagram	28
2.6	Search Data Use Case Diagram	31
2.7	Generate Report Use Case Diagram	33
3.1	SMKDIY AMSSS Context Diagram	39
3.2	Server Architecture	40
3.3	Static Organization for SMKDIY AMSSS	41
3.4	SMKDIY AMSSS Component Diagram	42
3.5	SMKDIY AMSSS Package/Subsystem Interface	43
3.6	SMKDIY AMSSS External Interfaces	43
3.7	SMKDIY AMSSS State Diagram	44
3.8	Data Visibility	45
3.9	Report Visibility	46
3.10	Search Visibility	46
3.11	Teacher Visibility	47
3.12	Data Subsystem Detail Design	48
3.13	Report Subsystem Detail Design	56
3.14	Search Subsystem Detail Design	65
3.15	Teacher Subsystem Detail Design	71

**LIST OF ACRONYMS / ABBREVIATION / GLOSSARY**

SMKDIY	Sekolah Menengah Kebangsaan Dato' Ibrahim Yaacob
SMKDIY	Sekolah Menengah Kebangsaan Dato' Ibrahim Yaacob
AMSSS	Attendance Management System with SMS Service
SMS	Short Message Service
SDK	Software Development Kit
OS	Operating System
ASAS	Automated Student Attendance System
RFID	Radio-Frequency Identification
GSM	Global System For Mobile Communications
SDLC	Software Development Life Cycle
SDD	Software Design Description
RAM	Random Access Memory
SRS	Software Requirement Specification
NWS	National Weather Service

## **PART 1**

### **INTRODUCTION**

#### **1.1 INTRODUCTION**

The purpose of this document is to specify the functions and requirements for the Sekolah Menengah Kebangsaan Dato' Ibrahim Yaacob (SMKDIY) Attendance Management System with SMS Service. Through this introduction, user can acknowledge what are expected from the system and how the components work with each other.

##### **1.1.1 Problem Statements**

As of today, attendance's record system in Sekolah Menengah Kebangsaan Dato' Ibrahim Yaacob (SMKDIY) is done manually during the school's assembly each morning. Teachers take attendance of his/her own class, attend the assembly and then pass the attendance records to the clerks at school's office after the assembly ended. There is some problem arise when too many documents handed to the clerks at once. Missing, uncheck records are just some of them. With almost 1200 students, a lot of



papers are involved which lead to messy desks. Through this system, it can help to promote paperless office which not only lessen the messiness but also save money and time, improve productivity, make documentation easier, secure personal information and most importantly it can help the environment.

Other than problem involving record's management, this system can help in decreasing student's truancy. At SMKDIY, administration only informs the parents about student's absenteeism when it occurred too frequently or consecutively for 3 days. School's administration cannot afford to report each student's truancy as there is not yet a system that can do so cheaply and effectively. This system can overcome the problems, as it has an automated SMS service that inform the parents each time their child did not come to school. This service is very efficient as it is cheap, fast and also promotes family friendly schools by building bridge of comfort and trust between both sides.

### **1.1.2 Objectives**

In order to develop the system, the overall objectives are:

1. To convert manual attendance system to computerize.
2. To provide SMS alert to parents about absentee.
3. To generate informative reports for school monitoring.

### **1.1.3 Scopes**

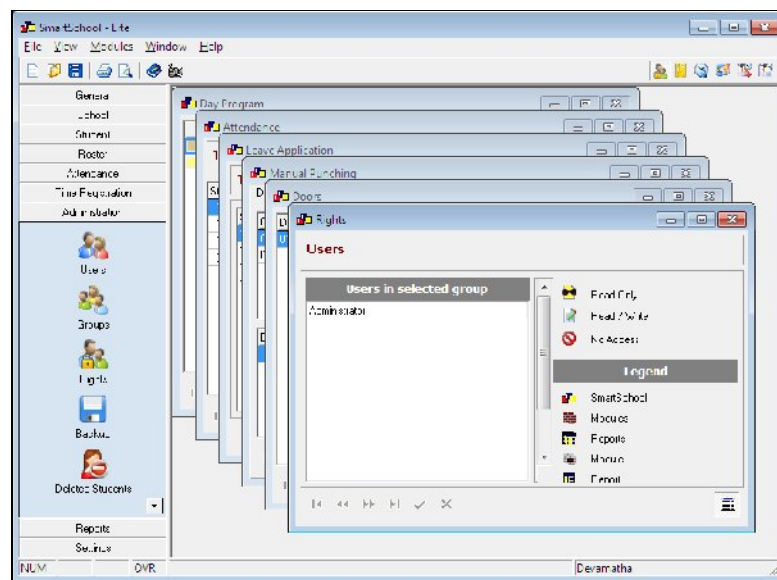
The scopes of the system are:

1. The users of the system are the teachers and clerks in SMKDIY.
2. To save students info, record the attendance using a smart phone and provide SMS alert system.
3. To develop android based system in smart phone using Android SDK.

4. This system can provide for about 2000 data.
5. To produce report about student's attendance performance.
6. To develop the system using Adobe Dreamweaver CS4 and Android SDK.
7. To develop the system using Acer Aspire 4740 and Samsung Galaxy S3.
8. To develop a system that operates on Windows OS and Android OS.

## 1.2 REVIEW PREVIOUS WORK

### 1.2.1 Smart School



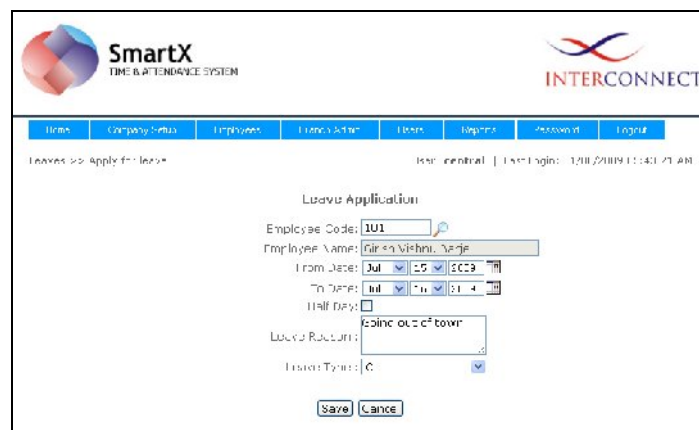
**Figure 1.1: Smart School Main Interface**

Smart School is school attendance software which facilitates parents and management with supervision and tracking capabilities. Figure 1.1 is the main interface of the system which is simple and manageable. It is engineered to accommodate all the stakeholders in school system. The system can be use to track student late in, early out,

extra time and others related with automated reports. Relevant reports about student attendance such as presence calculations get generated automatically. It also provides effective communication via email and SMS.

The strength of the software is it is highly flexible. Smart School can be configured according to client's comfortability no matter how complicated the rules are. The email/SMS to parents can be sent when child punches in or out of school and it also can be configured to any time/circumstances the clients want. The reports can be created on client's criteria and also can be schedule to be sent to client's email on any time interval he wants. Smart School is a stand alone system so this is where the weakness is since the access is limited to the users within school's compound. If the client needs reports from the system and is not in the school's compound, he needs to ask his colleague that is in the school to send it to him. This is unproductive and inefficient since there is no client stays in school 24hours. From the perspective of both strengths and weakness this system is still a dependable one but it is more suitable for smaller scale organization. The software can be improved more if there is a web based application inserted so that it has broader coverage and audience [1].

### 1.2.2 SmartX



The screenshot displays the SmartX Time & Attendance System interface. At the top left is the SmartX logo, and at the top right is the INTERCONNECT logo. Below the logos is a navigation menu with buttons for Home, Company Setup, Employees, Leave Application, Leave, Reports, Attendance, and Logout. The main content area shows a 'Leaves >> Apply for Leave' form. The form includes fields for Employee Code (101), Employee Name (Girish Vishnu Vazir), From Date (Jul 25 2023), To Date (Jul 26 2023), Half Day (unchecked), Leave Reason (going out of town), and Leave Type (C). There are Save and Cancel buttons at the bottom of the form.

**Figure 1.2: SmartX Apply for Leave Interface**

SmartX is an easy to use web based Time and Attendance System. Figure 1.2 shows the interface of the system. This system comes with two terminals which are biometric (fingerprint) and RFID card. The terminals are mounted near the entrance of the building where employees come in and out. Each employee have a card given or fingerprint registered by the administrator to use the system. The system is compulsory every time employee goes to and come home from work.

The system main strength is on the option of the terminal. Instead of usual one, client can choose from two or have both of them at once. Through this, even if employee accidently left behind his card he can still record his attendance with fingerprint. Other than that, its reports are available online on real time so those of late comers and early goers can be extra cautious next time as the management can see everything. As from what shown, the system seems to be suitable for larger organization since the product's price is high. It certainly a loss for smaller organization since this is a great system to use but the price is not applicable to deal with [2].

### 1.2.3 SmartSuite

The image shows a login form for SmartSuite. At the top, there is a green Android robot icon. Below it, the word "Login" is written in white on an orange background. The form has three input fields: "Username:" with a white text box, "Password:" with a white text box, and "Remember Password:" with a small square checkbox. Below the input fields is a red "Submit" button. At the bottom of the form, there is a link that says "Forgot password?".

**Figure 1.3: SmartSuite Login Form**

SmartSuite is comprehensive Time Attendance Management Software with advanced features and good design. Figure 1.3 shows the login form of the system. The software is a PHP based web software that supporting both Windows and Linux. Features inside included user management, shift management, payroll configuration, report management, organization charts, email/SMS facility and a lot more.

The strength of the software lays on their interesting design as design is important to attract client and also to intermediate the functionality of the system. As for the weakness, there is no mobile version of the application. Since the terminal used is the computer, if user wants to use his smart phone, the usage is restricted and constrained [3].

#### 1.2.4 AMIZONER

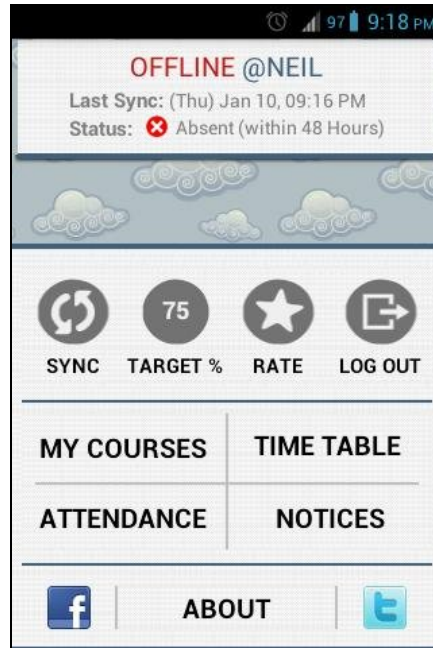


Figure 1.4: AMIZONER Homepage

AMIZONER is an application built by a student for his practical training project, hence the tagline, AMIZONER, Attendance Planner for Amitians by an Amitian. The application includes the attendance logs, time table, courses taken, notice boards and attendance decision maker. Figure 1.4 above shows AMIZONER homepage, the clear-cut design shows exactly what is inside the application and also the straightforwardness of the navigations. The TARGET % shows the minimal attendance percentage students need to achieve to pass the semester. MY COURSES menu shows the subjects taken for the semester and its individual attendance percentage and each subject is clickable to show more details to students. For the TIME TABLE, the menu shows the schedule for the day along with colored bar at the side and the ATTENDANCE shows the attendance records for the whole day.

The decision maker inside the application is one of the system's strengths. Each semester, there is percentage of classes students need to attend to pass and the application can help students to achieve it. As an example, if a certain subject has 16 classes, student needs to go to 12 of it to pass the semester so the application then leave a note of "You can miss four classes to maintain 75.0", as the absence increase the note change accordingly. The second strength is the colored side bar; each color represents difference danger level. In the TIME TABLE menu, each subject have its own color, green for "Drinking Wine Like A Sir" means you can miss classes without worrying, yellow for "Dancing On A Tightrope" means if you miss a class, you fall short of attendance and the last color, red "Diving With The Sharks" means student is in the dangerous level and needs to catch up. In general, the application applies the heuristic of match between system and real world as it is using customer's language and also concepts that familiar to them for the color is similar to that of a traffic light. For the weakness, the synching process is taking longer time as it has to parses 20 pages each time.

For improvements, the application should have another color scheme that can be an alternative as the current would not be appealing to every user. The last suggestion is

to include in date sheet and holiday info to keep students on track on further week's schedule [4].

### 1.2.5 Attendance Tracker



**Figure 1.5: Attendance Tracker Homepage**

Attendance Tracker is an application to register attendance for any type of event with quick and straightforward method. The application includes attendees' registration, create event, attendance report, data export and also user manuals. Figure 1.5 above shows the homepage of the application that designed with simple and basic setup. There is for main menus provided and each cycle start with the Setup menu. Here the user can create events where instance as in date, time and attendance amount decided for each events. The events then need to be configured to add the participants, there are five choices of how to add participants provided. Then, when the event comes the user go to Attendance menu where the actual registering of the attendance takes place. Attendance status is in the form of four our icons which are yes, no, unknown and medical/excused. The Metrics and Export is for attendance reporting and Manuals is the explanation on how to use the system.

The strength of the application lays in the export facility. User can export recorded data to excel for a hardcopy record, perfect for a backup and further analysis. Other than that, the means of adding participants are broad since there are five options. The recommended one is to use device contacts as it synched the names and pictures of the participants. The other option, import from Google Spreadsheet is very efficient as the function is widely use nowadays and accessible everywhere. As for the weakness, the interface is too basic especially the color scheme which is not interesting at all. The event icon is also limited and by far does not depict every type of event that can occur. Next is the incapability to synch with other user as in share the same event with two users, for example for a coach and assistant coach where they both take attendance in the same event from different devices.

For further upgrades, this application can consider to use synch/ share option to solve problem stated above. Through this, attendance taking can be done faster and more effectively especially of the attendee's amount is large. The sharing should not be limited to two persons only but unlimited to the involved parties [5].

### 1.2.6 Attendance



Students		Submit
Alexander, Henry	LATE Present Absent	
Benson, Susan	LATE Present Absent	
Conuple, Chales	LATE Present Absent	
Danson, Robert	LATE Present Absent	
Dupri, Dennis	Excused	
Lions, Jerry	LATE Present Absent	

**Figure 1.6: Attendance Record Page**



Attendance is a very straightforward application that does exactly what the name implies. Figure 1.6 shows the design of attendance page. It takes attendance in the form of absent totals and late totals, along with dates if there is any absent and late total recorded. The first step to use the application is to make a Google Spreadsheets consisted of five columns. First and second columns reserved for student's names, third for absent totals, fourth for late totals, and fifth for dates. Every other column after the fourth are reserved for dates of each of absent and late records. To add the spreadsheet to the application, user just needs to navigate to the main screen and select "Add Class" and the application is ready to be use.

The strength of the application placed in its simplicity and minimalism. The application size is only 201kb which barely disrupt the memory size and also it is supportable for android as early as 1.6 Donut, pretty much means almost all smart phones as the version is one of the earliest built and current phones usually equipped with 2.1 Éclair and above. Other than that, the application has done a great job on populating basic attendance reports in Google Spreadsheet which can be use for further needs. As for the weakness, the user needs to be really committed while taking attendance because if the user stop for a while and let the phone sleep, the program automatically exited and all the progress lost. The same thing happen happened when the user rotate his phone.

There are a lot of rooms of improvements for this application. First of all is the option should be more customizable instead of fixed like the current one. For example in the spreadsheet, the columns are set to five categories only and no addition is allowed while attendance records are not as simple as that. More columns should be provided, like for student id, email address, excused or an excused absent and attendance notes. The second one is an offline version of the application. Each time user wants to use the system, user needs to login to Google and can only do so when internet is available. Without one, the application cannot be use [6].

### **1.2.7 Simple Weather Alert**



**Figure 1.7: Simple Weather Alert Warning Page**

Simple Weather Alert is an application that runs in the background and monitors the official National Weather Service (NWS) alerts for various areas. New alerts then appear on the status bar, and user can read the details like shown in Figure 1.7 by selecting it. Through this application, user also can monitor more than one location for NWS alerts. SMS alert system in this application is provided if the user wants to alert friends about the current weather, for this facility the application requires Contact List permission.

The strength of this application falls on how users can modify notification based on NWS severity. For example, if an Extreme alert coming through, the phone vibrate, lights and bell for the same time meanwhile for simple Wind Warning maybe just a vibrate. The weakness is shorter battery life. Since everyday weather is difference from each other, this day notifications may be much more than yesterday thus decreasing phone's battery and user has to charge it frequently. It is also a huge problem because

usually during Extreme weather black out happen so the hand phone cannot be use for more urgent matters [12].

### 1.2.8 InviteWiz



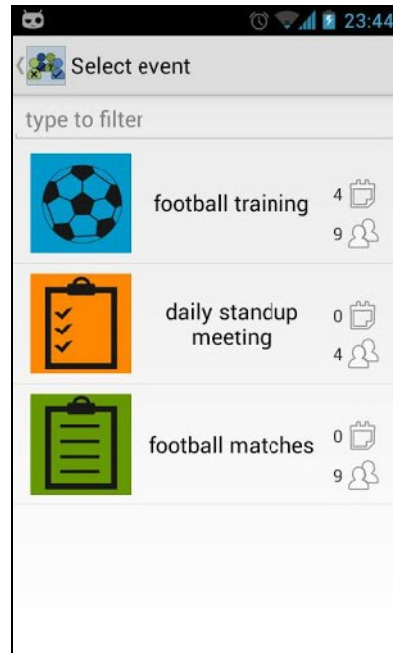
**Figure 1.8: InviteWiz Homepage**

A group SMS application that specializes in sending invites for group events by bulk text message and automatically tallying replies. This app is great for parties, meetings, sport games, club events and many more. The SMS feature is create group events and send invitations through SMS to the selected recipients. The Figure 1.8 above shows the homepage of the application. The invites can be send to any phone or device that can receive text messages, which means recipients do not need to have this application installed in their phones.

The strength of the system is the wide receiver of invitations without counting the need of this applications installed and the type of the phone. The recipient can be using

Nokia 3310 and this application's function can still reach it. The weakness is can only be seen if the user is using the free version which is the message footer. Each messages come with footer of "send by invite wiz for android", which can be a bit turn off [13].

### 1.2.9 Attendance Tracker



**Figure 1.9: Attendance Tracker Event Page**

Attendance Tracker is an application to register attendance for any type of event with quick and straightforward method. The application includes attendees' registration, create event, attendance report, data export and also user manuals. Figure 1.9 above shows the event page for the application. The SMS facility is provided if the user wants to reach out to the participants directly from the application when the participants are missing or did not come to the event. Very effective in overcoming student's truancy or just simply to check up the attendee conditions.

The strength of the application lays in the export facility. User can export recorded data to excel for a hardcopy record, perfect for a backup and further analysis. Other than that, the means of adding participants are broad since there are five options. The recommended one is to use device contacts as it synched the names and pictures of the participants. The other option, import from Google Spreadsheet is very efficient as the function is widely use nowadays and accessible everywhere. As for the weakness, the interface is too basic especially the color scheme which is not interesting at all. The event icon is also limited and by far does not depict every type of event that can occur. Next is the incapability to synch with other user as in share the same event with two users, for example for a coach and assistant coach where they both take attendance in the same event from different devices.

For further upgrades, this application can consider to use synch/ share option to solve problem stated above. Through this, attendance taking can be done faster and more effectively especially of the attendee's amount is large. The sharing should not be limited to two persons only but unlimited to the involved parties [5].

#### **1.2.10 Advantages and Disadvantages of Previous Work**

All the case studies have their own strength and weakness. Table 1.1 below shows the details of it. Web based is for whether the system has a website, SMS/email facilities inside the system, mobile version and terminal is for the means of data insertion into system.

**Table 1.1 Pros And Cons Between Previous Works**

	<b>Smart School</b>	<b>SmartX</b>	<b>SmartSuite</b>
<b>Web Based</b>	No	Yes	Yes
<b>SMS/Email</b>	Yes	Yes	Yes
<b>Mobile Version</b>	No	No	No
<b>Terminal</b>	Computer	Biometric and RFID Card	Computer

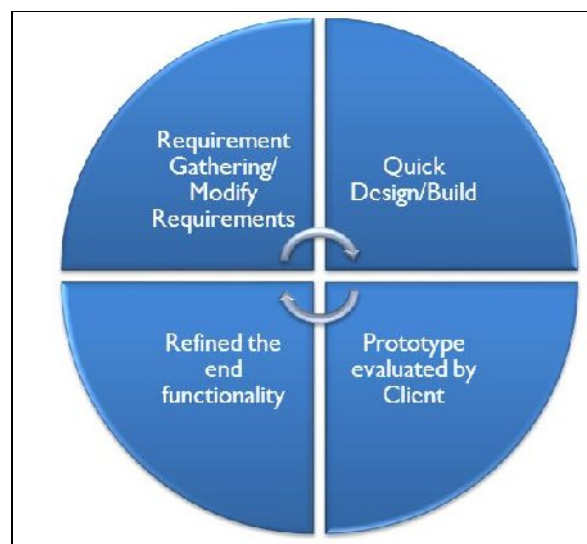
### 1.3 CURRENT SYSTEM AND LIMITATIONS

Attendance system in SMKDIY currently is using manual system where teachers tick on an official student's attendance booklet. There are a lot of limitations with this system that inhibits effective school management. First of all are the common errors since it used handwriting. Teachers may accidentally ticked off another student name, the repetition of work such as writing student's names each month may cause tediousness and unreadable handwriting which then cause a problem for the clerks that need to use the data. The second limitation is there is a lot of paperwork involved since everything is written manually in paper. 60 booklets yearly, 300 for the 5 years students spend in high school definitely not a small amount since it need to be kept for future references. Manual system also consumes a lot of space since everything is kept in filling cabinets. As the amount students and years increase so does the space.

Another limitation is slow retrieval of data. When everything is kept in filling cabinets, relevant data is harder to find. When the time comes for performance's report at the end of year, the effort taken to find meaningful data and statistic in the system can be tenfold. The likelihood for data discrepancy to happen also increase when there is too

much documents involved. The data might get misplaced during the manual filing and causing it to be unavailable for reference. The last limitation is the lack of security since everything is stored in filing cabinets and accessible pretty much to everyone. It also exposed to natural calamity such as flood and fire, since everything is basically in the cabinets without a back up all the data are irrecoverable.

#### 1.4 METHODOLOGY



**Figure 1.10: Repeated Steps Of Prototyping Model**

The methodology implied in the project development is the prototype model. Prototype is made first and based on it the final product is then be developed. A prototype is a model or a program which is not based on exact planning, but is an early approximation of the final product or software system. A prototype acts as a sample to test the process. From the sample we learn and try to build a better final product. There are 4 phases in prototype model. They are requirement gathering, quick design, client evaluation and refined the end functionality. A systems development life cycle (SDLC) has three primary objectives. Firstly, to ensure that high quality systems are delivered, to provide strong management controls over the projects, and to maximize the productivity

of the systems developer.

### 1.4.1 Requirements Gathering

Requirement gathering is either a new requirement gathering or modification of existing requirements based on client feedback on previous prototype system. This phase is carried out at the earliest stage of each cycle. In this phase, Software Requirement Specification (SRS) is made. All requirements such as the concept of the application, data and the entire important element are gathered from the client. This is to make sure they are no data that is left over to put in the project. For modification, the changes or enhancements from previous evaluation are taken note and added into the new system development.

All the information had been gathered to make sure the web is based on the requirement from the client. Table 1.2 shows the information that need to be gathered to develop this system.

**Table 1.2 Information that need to be gathered**

<b>Source</b>	<b>Information Gathering</b>
Client	Flow of the system <i>(How the system should work?)</i>  Data Information of the system <i>(What data should be included in the system?)</i>
System	Users of the system