

# Development of Attendance Management System: An Experience

Siti Hawa Apani, Rozlina Mohamed

Faculty of Computer Systems & Software Engineering,  
Universiti Malaysia Pahang  
26300 Gambang, Kuantan, Pahang, Malaysia  
rozlina@ump.edu.my

**Abstract.** Class teacher need to take students' daily attendance for every school days and analyze of attendance data. It is hassle for teacher to make analysis of attendance data manually and ensure no error prone in that process. This study proposes to develop a web based application, Attendance Management System (AMS) to solve this problem. This system is part of SMA (*Sekolah Menengah Agama*) Management System and is implementing in Pahang religious schools under supervision of *Jabatan Agama Islam Pahang* (JAIP). This system includes functions for class teacher to record student attendance, *Guru Penolong Kanan* (GPK) to generate school attendance report and the discipline teacher to view truancy statistics. The result shows that this system can help the school management to manage the student attendance.

**Keywords:** Attendance Management System, Web based application

## 1 Introduction

Successful schools begin by make sure their students come to school regularly. The consequences of low attendance are serious and not just affect the students who miss school but also affect the community. The attendance rate tells us the average percentage of students attending school in each day in the given year, as reported by the state Department of Education. Sometimes students and parents might question why school attendance is so important. Parents might think it is not worth fighting with their child to get out of bed and make them to go to the school. [1] Going to school regularly is important to the student future. For example, students who miss school frequently can fall behind with their work and do less well in exams. Research shows that children who attend school regularly could also be at less risk of getting involved in antisocial behavior or crime. [2] There are many different issues which can affect school attendance such as bullying, house or care arrangements, transportation and money. Parent can help prevent their child skipping school by making sure they understand the importance of good attendance and functionality, taking an interest in their education by asking about their school work and encourage them to get involved in school activities, and discuss any problems with their child that they might face at school and inform to their teacher about anything serious. [3]

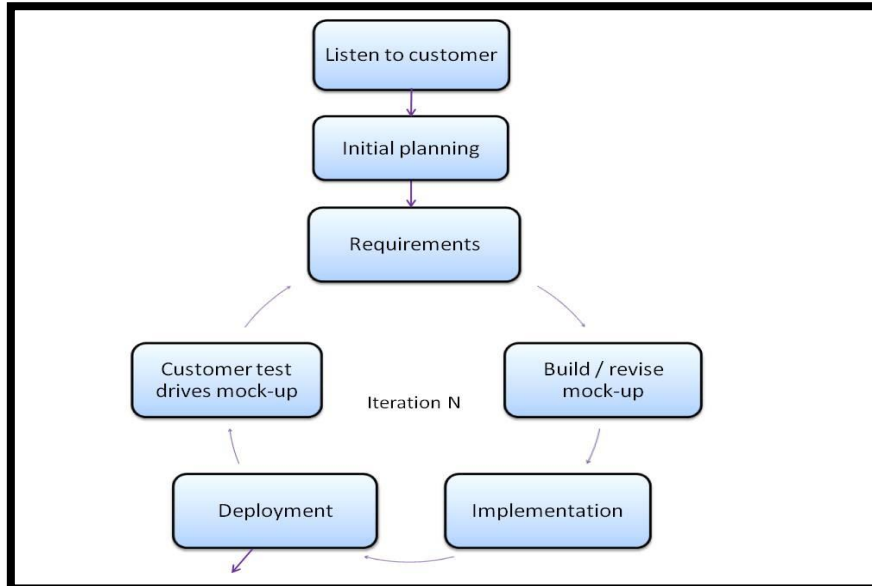
For manual attendance system, the most common problem is the class teacher need to take student daily attendance and manually filled the record in attendance book for every month. If the attendance book is missing or misplace, it could lead to big problem because the teacher need the attendance record to make analysis and generate an attendance report. Another problem is the teacher will need more time to analyze and generate the attendance report because the teacher needs to search and refer the old attendance record first. Besides that, an error could happen when the teacher make the calculations to generate the attendance report by themselves. Even though the attendance record is hassle to keep by the class teacher, management report is required in urgent basis. Analyzed attendance record is required by JAIP for future actions is normally being delay because of the lack of precise. Moreover, delay analyzes would leads to prolong the time to inform the parents about the truancy students.

Addressing this issue, this paper discusses the strategy to analyze and generate reports related to attendance, provide trigger facilities in conjunction to pre-defined consequences and develop a prototype of attendance management system.

The rest of the paper is organized as follows. Section 2 illustrates a methodology and development of the AMS. Section 3 describes the implementation and result. Section 4 highlights the discussion and lesson learned that arising from the development. Section 5 discusses the future research. Finally, section 6 provides the conclusion.

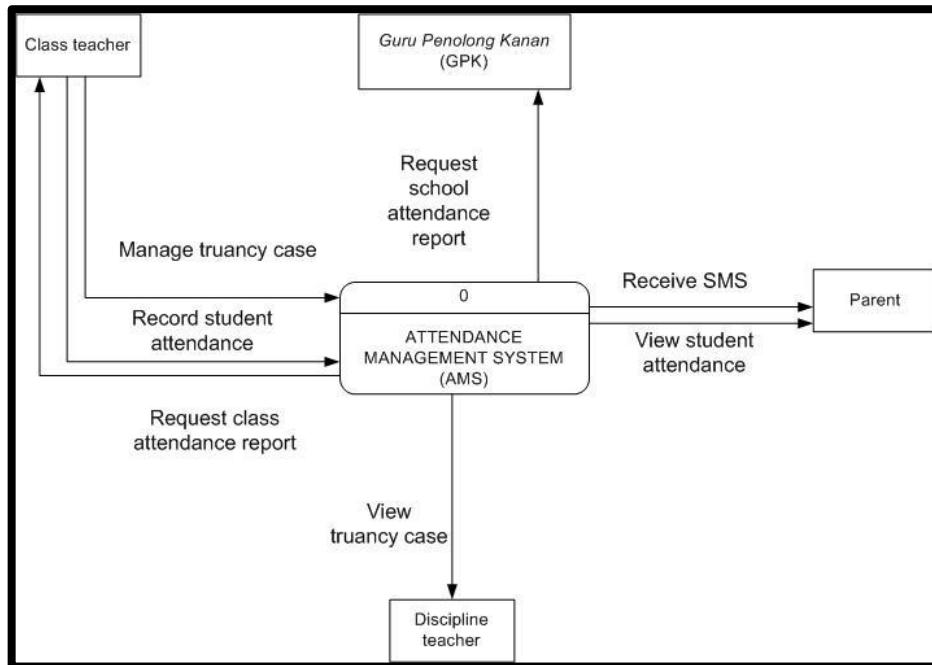
## **2 Methodology and Development**

This project conducted based on the new proposed of software development methodology called PIID which is the combination of Prototyping model and also Iterative and Incremental Development. The PIID diagram can be seen in Fig. 2.1. This combination of methodology is use because the Prototyping model involves user involvement and the developers can receive quantifiable user feedback [5] while in Iterative and Incremental Development is easier to test and debug during a smaller iteration [6]. In first PIID phase, we see client which is developer in SUK and listen about the scope system. For the next phase which is initial phase, we need to plan how much iteration can be including in the systems. There are third iterations which are student attendance, report and discipline module. Then we will go to the iteration cycles. There are five phases in each iteration. Firstly, requirement phase is about the phase where we get the entire requirement about functions and operations need to be include in each iteration. The requirements can be documented by draw diagram that shows all functions that have in the system. The build / revise mock-up phase means we will sketch the interface while implementation phase means we start to write coding. For deployment phase, the iteration that has been finish will be sent to the client for testing purpose. Then, the client will test the drives mock-up. After that, the client evaluates the prototype system whether satisfy them or not. If not satisfy, the mock-up screen need to be revised again.



**Fig. 2.1** Combination of Prototyping model and Iterative and Incremental Development (PIID)

Fig. 2.2 shows the context diagram that summarizes all processing activity within the Attendance Management System (AMS). By using context diagram, we can see the users of AMS and task of each user.



**Fig. 2.2** Context Diagram

Fig. 2.3 shows the Entity Relationship Diagram (ERD) of the system. It shows relationship of tables in a database. SMA is developed based on a single database, named SPSMA. For AMS, table of eventcalendar, tkehadiran and tponteng are created whereas the remaining table is unchanged. Table of tkehadiran will record the student attendance, while tponteng will trigger the record of student absent and eventcalendar will record about school calendar activity.

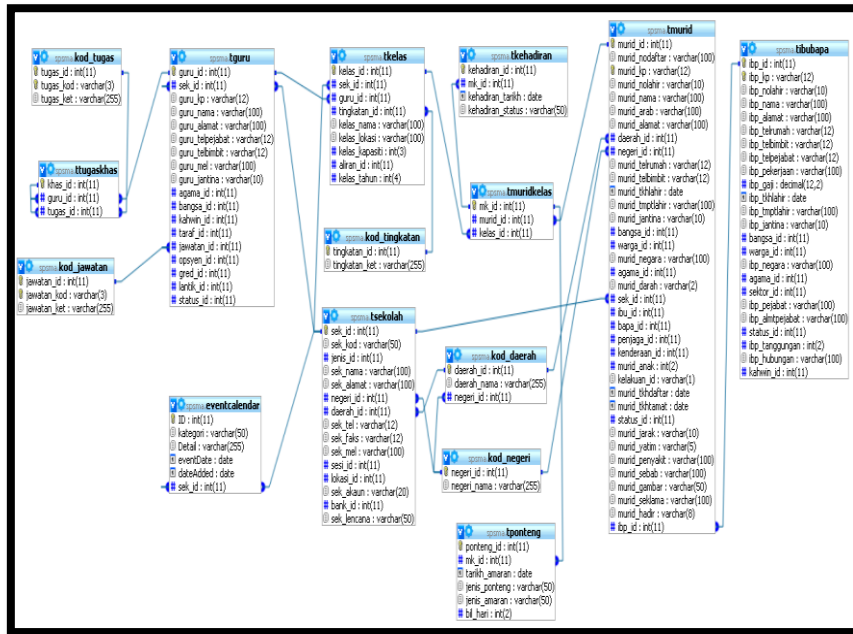


Fig. 2.3 Entity Relationship Diagram (ERD)

### 3 Implementation and Result

This section is to discuss the implementation and result of the system. There are three modules which are student attendance, report and discipline modules. The details can be seen in Table 3.1.

Table 3.1. Explanation of the system modules.

Modules	Details
Student Attendance Module	This feature is used by the class teacher to manage student attendance. The class teacher can add, edit student attendance and also view student attendance report.
Report Module	This feature used by GPK to generate school attendance report that later need to be sent to the JAIP. The GPK also can manage school activities to be view in school calendar.
Discipline Module	A SMS will be sent to the parent mobile phone to notify about student absent or student truancy. A warning letter will be generate for those truancy student. Parents also can view their child attendance report using the web application. Discipline teacher can view the discipline case report for selected month and year or specified student.

The developed application, Attendance Management System have achieved all the objectives of this project, which are to develop an online system to help the school management to manage student attendance and provide facility to inform parents about students attendance behavior. For Student Attendance Module, the class teacher will see the interface in Fig. 3.1 to manage the student attendance. Fig. 3.2 will be see by GPK for Report Module. The discipline teacher will see interface like in Fig. 3.3 and Fig. 3.4 for the Discipline Module.

**Ambil Keadatangan Harian**

Tingkatan 1 CERDAS TARIKH: 2012-05-10

BIL.	NAMA PENUH (HURUF BESAR & MENGIKUT SUSUNAN ABJAD)	JANTINA	STATUS
1	AHMAD YAMINHANIF BIN SIRUN	L	Tidak Hadir
2	NADIRAH ADIBA BINTI AFANDI	P	Hadir
3	NIK NUR HUSNA NADIA BINTI NIK SHUHAIRAZI	P	Hadir

**Fig. 3.1** Interface to manage student attendance

Lihat Penyata Bulanan

**JABATAN AGAMA ISLAM PAHANG  
(BAHAGIAN PENDIDIKAN JAIP)**

**PENYATA BULANAN MURID-MURID  
SEKOLAH MENENGAH AGAMA PULAU TAWAR, Jerantut**

Penyata Bagi Bulan : Mac Tahun : 2012

Penyata ini hendaklah dihantar ke Jabatan ini dalam minggu pertama bagi bulan-bulan Februari, Mac dan seterusnya sehingga akhir tahun persekolahan.

**1. HARI PERSEKOLAHAN**

(a) Bilangan hari belajar bulan ini : 16  
 (b) Bilangan hari kelepasan bulan ini : 15  
     (i) Bilangan hari kelepasan minggu : 15  
     (ii) Bilangan hari kelepasan Am : 0  
     (iii) Bilangan hari kelepasan khas : 0  
 (c) Jumlah hari belajar dan hari kelepasan bulan ini : 31  
 (d) Catatan hari kelepasan :

HARI KELEPASAN	TARIKH	KETERANGAN
KELEPASAN MINGGUAN	3, 4, 10, 11, 17, 18, 24, 25, 31,	SABTU DAN AHAD

**2. BILANGAN MURID**

(a) Jumlah bilangan murid akhir bulan lalu : 0  
 (b) Jumlah bilangan murid masuk bulan ini : 0  
 (c) Jumlah bilangan murid keluar bulan ini : 0  
 (d) Jumlah bilangan murid akhir bulan ini : 0  
 (e) Jumlah bilangan murid yang tidak hadir bulan ini : 7  
     (i) Tidak hadir : 6  
     (ii) Tidak hadir ada surat : 1  
     (iii) Ponteng sekolah : 0  
     (iv) Gantung sekolah : 0

**Fig. 3.2** Interface of school attendance report

**Hantar SMS**

No. Telefon Bimbit :

Mesej :

**Fig. 3.3** Interface of SMS

**SURAT AMARAN PONTENG**


**SEKOLAH MENENGAH AGAMA PULAU TAWAR**  
27050 Pulau Tawar  
Jerantut Pahang

No. Tel. : 092669342  
No. Faks : 092671270

-----

Ruj. Kami :  
Tarikh : 20 MEI 2012

Kepada,  
PUJAN NUR ATIQAH BINTI AHMAD BAKARI  
No.65, Lorong Setongkol 4, Perkampungan Cenderawasih, 25200 Kuantan



Tuan,

**LAPORAN DISIPLIN / SALAH LAKU PELAJAR**

Dengan hormatnya saya merujuk perkara di atas.

2. Dukacita dimaklumkan bahawa anak jagaan tuan / puan yang bernama **HIK HUR HUSIA HADIA BIHITI HIK SHUHAIRAZI** pelajar **Tingkatan 1 CERDAS** telah didapati melanggar Peraturan Sekolah / Asrama iaitu:

Tidak hadir **PONTEIG BUKAH BERTURUT-TURUT** ke sekolah selama **10** hari pada

**Selasa, 10-01-2012**  
**Selasa, 17-01-2012**  
**Isnin, 30-01-2012**  
**Jumaat, 03-02-2012**  
**Rabu, 08-02-2012**  
**Isnin, 13-02-2012**  
**Isnin, 20-02-2012**  
**Selasa, 21-02-2012**  
**Rabu, 29-02-2012**  
**Isnin, 05-03-2012**

**Fig. 3.4** Interface of warning letter

## **4 Discussion**

The main limitation of our work is to get the data from the customer / client. The Attendance Management System is a sub module of School Management System that develops by Setiausaha Kerajaan (SUK). Thus, the collaboration with SUK is necessary to fulfill the client which is the Pahang religious school requirements. It is rather difficult for them to give the information because of it is private and confidential. Another constraint is to understand the client about how the system will work or flow of the system, what they want to have because maybe in the middle of the development, they request for changes in the system. To settle all of the constraints, all the documents and system progress need to back up properly and must be recorded because of when problem occur, it is easy to refer.

## **5 Future Research**

Several recommendations have been received from the client in order to improve the Attendance Management System application. The future research will improve the AMS in several factors such as visualization and compatibility. On visualization perspective, improvement will focus on providing a better visualization such as plotting graph chart for comparison, used of table to visualize the details. The graph chart is believed able to help user to analyze the attendance result in a better way. For compatibility factor, the improvement will be focus on how the AMS system will be suitable not only for SMA but also able to be modified as attendance system to be used by other organization such as primary and secondary school, tuition center, college and universities.

## **6 Conclusion**

Attendance Management System (AMS), a web based application, has been developed and proved on helping school management to manage student attendance. The development design is using context diagram to show overall task of each user and ERD to show relationship between database tables. Our experiences indicated that the development design by using context diagram and ERD is suitable to be implemented in integrated project such as AMS.

## **Acknowledgement**

We would like to thank all lecturers of Faculty of Computer Systems & Software Engineering, Universiti Malaysia Pahang and developer staff in Bahagian Teknologi Maklumat, Setiausaha Kerajaan Negeri Pahang (SUK) for their help and making this project possible.



## References

- [1] Acschmid (2011) Why is school attendance so important?  
<http://youthservicesslc.wordpress.com/2011/01/03/why-is-school-attendance-so-important/> (Accessed 20 March 2012)
- [2] GreatSchoolsStaff (n.d.) School Attendance: Issues to Consider  
<http://www.greatschools.org/parenting/behavior-discipline/644-school-attendance-issues.gs>  
Accessed 20 March 2012
- [3] Directgov (n.d.) School attendance, absence and your child  
[http://www.direct.gov.uk/en/Parents/Schoolslearninganddevelopment/YourChildsWelfareAtSchool/DG\\_4016117](http://www.direct.gov.uk/en/Parents/Schoolslearninganddevelopment/YourChildsWelfareAtSchool/DG_4016117)  
Accessed 20 March 2012
- [4] M. Man, W. A. W. A. Bakar, and M. L. Puniran. "e-Kehadiran: A Malaysian Model for Controlling and Monitoring Student's Absence Misconduct Via Online," International Journal of Computing and Corporate Research IJCCR, India, pp. 1-15.
- [5] (n.d.) What is Prototyping?  
<http://www.umsl.edu/~sauterv/analysis/prototyping/proto.html>  
Accessed 20 March 2012
- [6] Raymondlewallen (2005) Software Development Life Cycle Models.  
<http://codebetter.com/raymondlewallen/2005/07/13/software-development-life-cycle-models/>  
Accessed 20 March 2012