Chapter 2

by Muhammad Darlen Sava

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CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

In this chapter, the literature review involved with the proposed system will be described in detail. It will become the source of information about existing systems or identical systems from the current market. By comparing them with the proposed system the enhancement that can be made will become clear. The technology that will be used in the development will also be stated.

2.2 Case Study (If any)

The proposed system is based on a case study from one of the institutions in Banda Aceh, Aceh, Indonesia. The name of the institution is SMAS MUHAMMADIYAH 1 BANDA ACEH which is a private high school that has been existing for around 62 years. They are one of few high schools in Banda Aceh that have accreditation of A.

2.2.1 Company Organization Structure

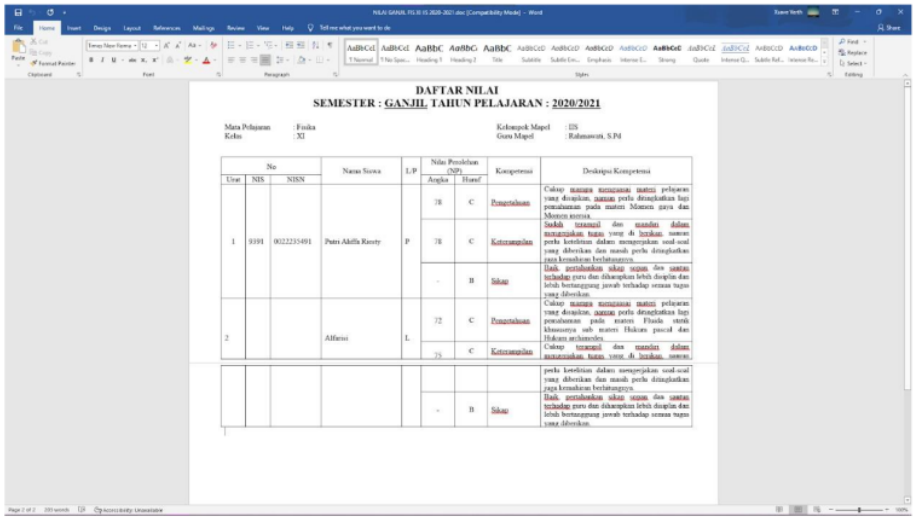
SMAS Muhammadiyah 1 is a private high school in Aceh, Indonesia. Just like other institutions they also have the same organizational structure at their level. They consist of teachers from across Aceh that are qualified with quality and in-depth knowledge of their subject while also maintaining their responsibilities as a teacher. The picture below is the organizational structure for SMAS Muhammadiyah 1.

Figure 2.1: Organization Chart of SMAS MUHAMMADIYAH 1 BANDA ACEH

2.2.2 Manual Operation

The current system used by SMAS Muhammadiyah 1 to manage academic data is still involved using traditional and manual ways. This is ranging from marking student reports, and managing attendance records, to even keeping track of tuition records. For the marking student report process, it takes multiple teachers to recap all of the marks a student got. First, the teacher that is responsible for the course will collect their student's marks from a table that they have to fill in each time they give a mark for an assignment or in-class exercise. Then this excel table will be sent to the homeroom teacher. In the end, the homeroom teacher will have multiple excel files that they will put into the report book. The report book is also made using word/excel. From this point, we can conclude that the data is still not centralized because it moved from teacher to teacher.

As for managing the attendance record, they are still using an attendance book which will be filled by teachers that will teach in the class that day. This attendance book then will be used as a reference for the teacher by the end of the semester to be inputted into students' report books on how much they are absent because of sickness, and with/without permission. In managing the tuition record, the teachers at SMAS Muhammadiyah also still use what we called tuition book/card. This tuition book/card works the same way as the others mentioned above. The homeroom teacher will receive payment from the student's parents and when they confirm the payment then they will approve it in the tuition book that the student has paid for the semester. The students also need to manually write down the schedule/timetable because it is usually only printed once and put in the front of the class. All of these manual operations can be seen in the pictures below,



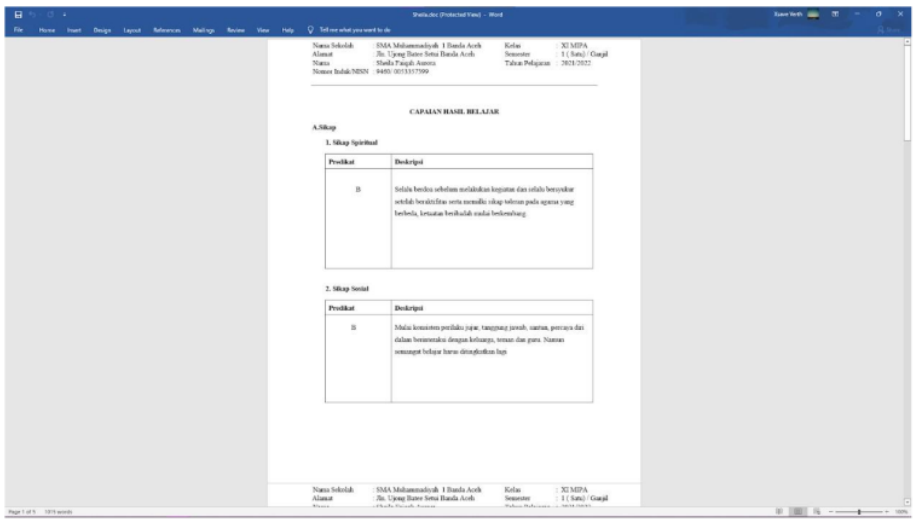
DAFTAR NILAI
SEMESTER : GANJIL TAHUN PELAJARAN : 2020/2021

Mata Pelajaran : Fisika
Kelas : XI

Kelompok Mapel : IIS
Guru Mapel : Rahmawati, S.Pd

No			Nama Siswa	L/P	Nilai Pengetahuan (NP)		Kompetensi	Deskripsi Kompetensi
Urut	NIS	NISN			Angka	Huruf		
1	9391	0022235491	Putri Adelfia Rasyty	P	78	C	Pengetahuan	Cukup menguasai materi pelajaran yang disajikan, namun perlu ditingkatkan lagi pemahaman pada materi Momen gaya dan Momen inersia.
					78	C	Keterampilan	Sudah terampil dan mandiri dalam menyajikan tugas yang di berikan, namun perlu ketelitian dalam menjawabkan soal-soal yang diberikan dan masih perlu ditingkatkan pada kemahiran berhitungnya.
					-	B	Sikap	Baik, pertahankan sikap sopan dan santun terhadap guru dan ditingkatkan lebih disiplin dan lebih bertanggung jawab terhadap semua tugas yang diberikan.
2			Alfiansi	L	72	C	Pengetahuan	Cukup menguasai materi pelajaran yang disajikan, namun perlu ditingkatkan lagi pemahaman pada materi Fluida statis khususnya sub materi Hukum pascal dan Hukum archimedes.
					75	C	Keterampilan	Cukup terampil dan mandiri dalam menyajikan tugas yang di berikan, namun perlu ketelitian dalam menjawabkan soal-soal yang diberikan dan masih perlu ditingkatkan pada kemahiran berhitungnya.
					-	B	Sikap	Baik, pertahankan sikap sopan dan santun terhadap guru dan ditingkatkan lebih disiplin dan lebih bertanggung jawab terhadap semua tugas yang diberikan.

Figure 2.2: Manual marking of students



Nama Sekolah : SMA Muhammadiyah 1 Banda Aceh
Alamat : Jln. Ujung Batee Setia Banda Aceh
Nama : Sheila Fauqh Azeera
Nomor Induk/NISN : 9480/ 0033357599

Kelas : XI MIPA
Semester : 1 (Satu) / Ganjil
Tahun Pelajaran : 2021/2022

CAPAIAN HASIL BELAJAR

A.Sikap

1. Sikap Spiritual

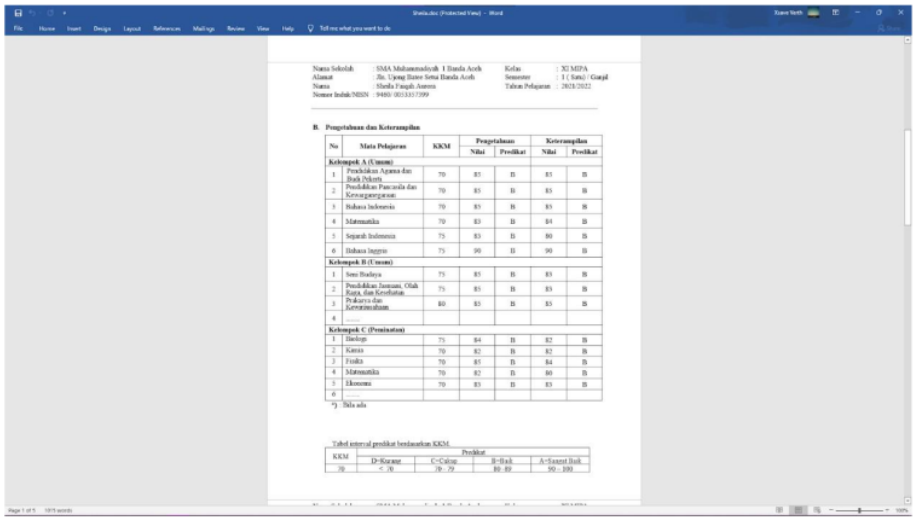
Predikat	Deskripsi
B	Selalu berdoa sebelum melakukan kegiatan dan selalu bersyukur setelah beraktifitas serta memiliki sikap toleran pada agama yang berbeda, ketuatan berihadah sudah berkembang.

2. Sikap Sosial

Predikat	Deskripsi
B	Mulai konsisten perilaku jujur, tanggung jawab, santun, percaya diri dalam berinteraksi dengan keluarga, teman dan guru. Namun semangat belajar harus ditingkatkan lagi.

Nama Sekolah : SMA Muhammadiyah 1 Banda Aceh
Alamat : Jln. Ujung Batee Setia Banda Aceh
Kelas : XI MIPA
Semester : 1 (Satu) / Ganjil

Figure 2.3: First page of the report book of a student



Nama Sekolah : SMA Muhammadiyah 1 Banda Aceh
Alamat : Jln. Ujung Batee Setia Banda Aceh
Nama : Sheila Fauqh Azeera
Nomor Induk/NISN : 9480/ 0033357599
Kelas : XI MIPA
Semester : 1 (Satu) / Ganjil
Tahun Pelajaran : 2021/2022

B. Pengetahuan dan Keterampilan

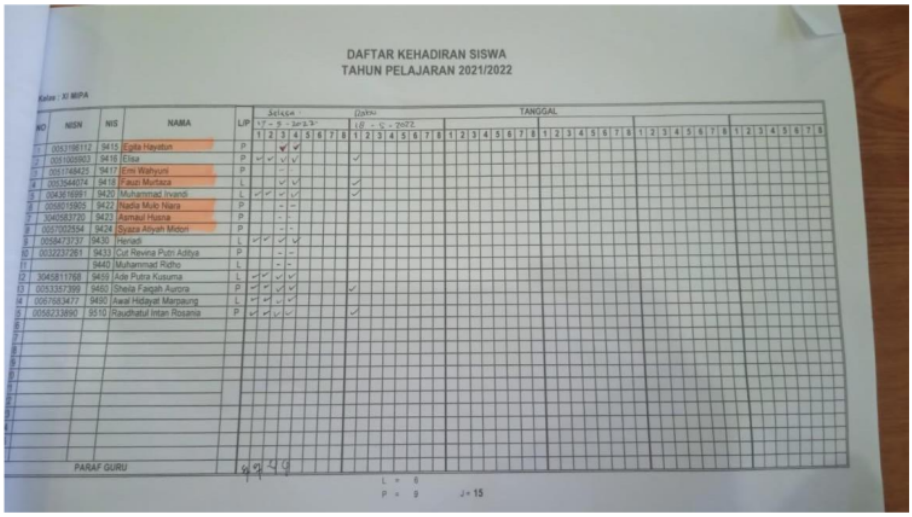
No	Mata Pelajaran	KKM	Pengetahuan		Keterampilan	
			Nilai	Predikat	Nilai	Predikat
Kelompok A (Umum)						
1	Pendidikan Agama dan Budi Pekerti	70	85	B	85	B
2	Pendidikan Pancasila dan Kewarganegaraan	70	85	B	85	B
3	Bahasa Indonesia	70	85	B	85	B
4	Matematika	70	83	B	84	B
5	Sejarah Indonesia	75	83	B	80	B
6	Bahasa Inggris	75	90	B	90	B
Kelompok B (Umum)						
1	Seni Budaya	75	85	B	85	B
2	Pendidikan Jasmani, Olah Raga, dan Kesehatan	75	85	B	85	B
3	Prakarya dan Kewirausahaan	80	85	B	85	B
4	.....					
Kelompok C (Peminatan)						
1	Biologi	75	84	B	82	B
2	Kimia	70	82	B	82	B
3	Fisika	70	85	B	84	B
4	Matematika	70	82	B	86	B
5	Ekonomi	70	83	B	83	B
6	.....					

*) Bila ada

Tabel interval predikat berdasarkan KKM.

KKM	Predikat			
	D=Kurang	C=Cukup	B=Baik	A=Sangat Baik
70	< 70	70 - 79	80- 89	90 - 100

Figure 2.4: Second page of the report book of a student



DAFTAR KEHADIRAN SISWA
TAHUN PELAJARAN 2021/2022

Kelas : XI MIPA

| NO | NISN | NIS | NAMA | L/P | Selasa, 17 - 9 - 2021 | | | | | | | | Jum'at, 10 - 9 - 2021 | | | | | | | | TANGGAL | | | | | | | |

2.3 Current System Analysis

In the current system several platforms are used causing the data to be decentralized. Some of the examples of platforms used are Microsoft Word, Microsoft Excel, Whatsapp, and also a manual operation using handwriting. The proposed system will fix this issue by having a centralized database, this way the data will not be scattered across different platforms. The current system also involved using handwriting in some instances such as filling in the attendance book or tuition book/card. Microsoft Word and Excel are used for filling in the report book and keeping track of students' marks respectively. There are also some parts of the report book in which the teacher has to handwrite them. As for Whatsapp, it is usually used to confirm the payment of students' tuition through their parents or even the students themself. The current task of taking students' attendance is also done manually. The teachers that are teaching in that particular classroom will take the student's attendance based on how many hours they teach on that day with a total of 8-hour slots per day. When the next teacher comes, they will also take attendance once again and all of this is recorded in a book called attendance book.

2.4 Similar Existing System Analysis

2.4.1 UTM Academic Management System

UTM Academic Management System (ACAD) is a web-based system that helps to manage student academic data. This system allows the management of students' data such as grades, personal information, and finances among other things. This system is personalized for students and lecturers of University Teknologi Malaysia. Although it is a bit convoluted to access because it is hidden behind another website called My UTM which then will redirect users to this system, it still provides its intended functions. Pictures below show the UI of my UTM and UTM ACAD

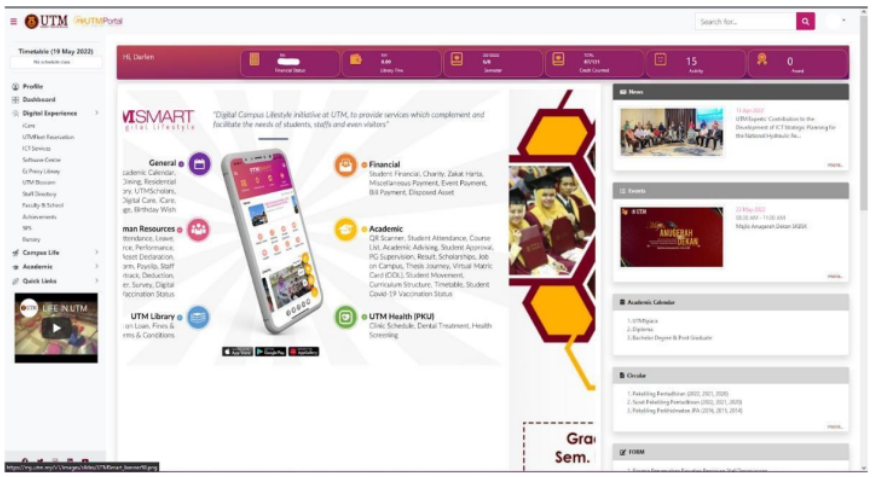


Figure 2.7: myUTM, Portal to UTM ACAD

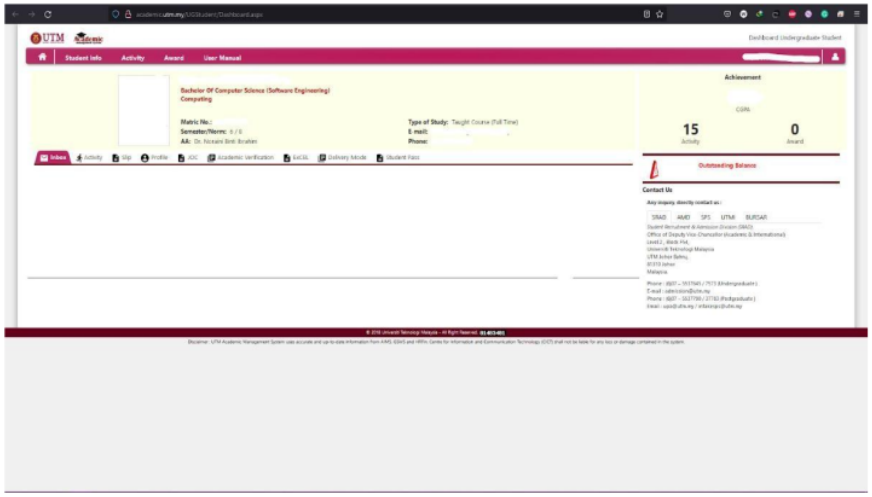


Figure 2.8: UTM ACAD

2.4.2 Evaluation

The evaluation application is used to assess student learning results. This application evaluates the productivity of students based on exam scores, tests, and other activities (evaluation, 2016). Based on the brief explanation, this application mainly functions to help teachers monitor their student's growth and progress online. Below is the UI of evaluation:

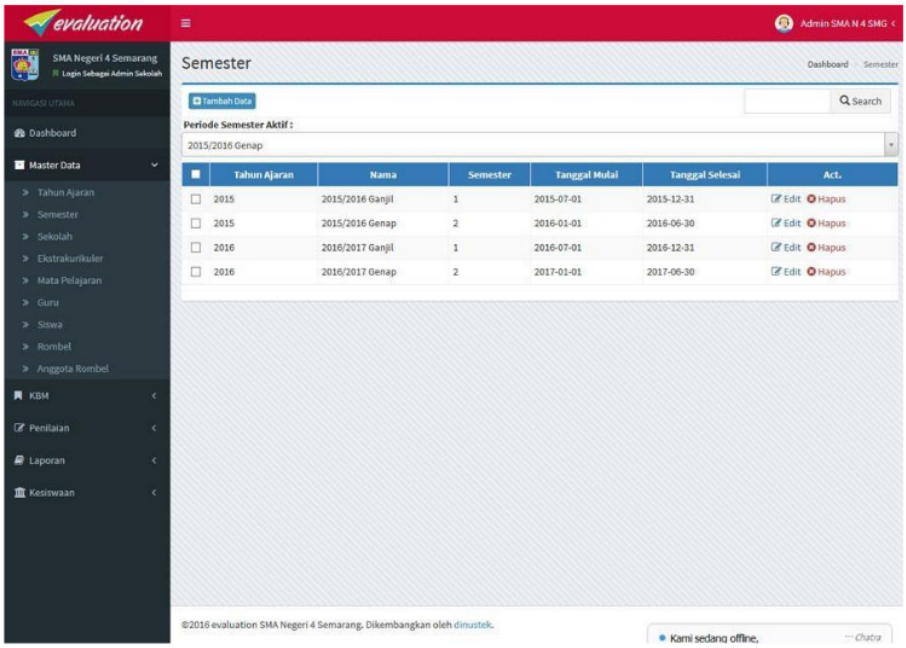


Figure 2.9: Semester Data UI of evaluation

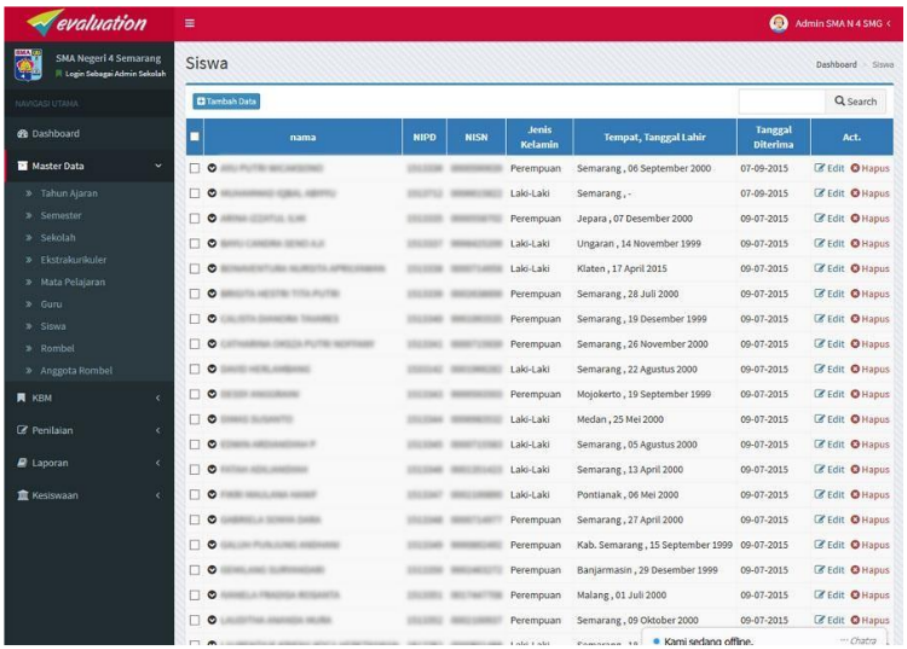


Figure 2.10: Students data UI of evaluation

2.4.3 Sekawan Media Aplikasi Rapor Online

Rapor Online is a web-based application that makes it easy to report student learning outcomes. The Rapor Online application helps in reporting student grades from elementary to upper levels (Sekawan Media). Some of the highlights of this system are the functions such as counseling which the other existing system did not have.

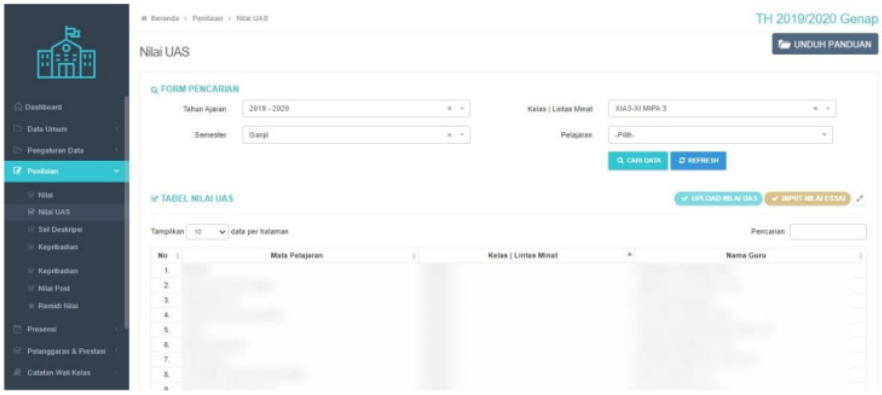


Figure 2.11: School final exam marking UI of Sekawan Media Aplikasi Rapor Online

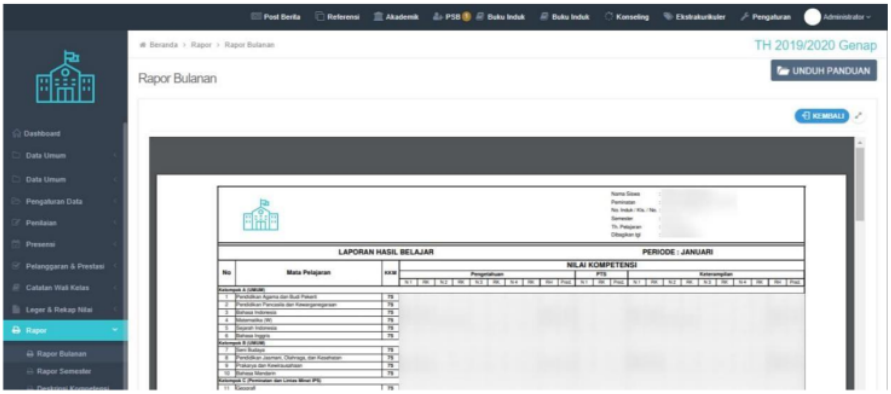


Figure 2.12: Generated report book UI of Sekawan Media Aplikasi Rapor Online

2.5 Comparison Between Existing Systems

In table 2.1 the comparison of functions/features between existing systems is shown. The proposed system is not included in the table because it is to be expected to include the functions that the existing system did not have or have. The main similarity between them is that all of them have the function to mark and generate reports. The existing system also has similarities with them not having a function to generate a timetable. Other than that they are pretty diverse in terms of having the functions or not.

Table 2.1: Comparison between existing system and proposed system

Function/Feature	UTM Academic Management System	evaluation	Sekawan Media Aplikasi Rapor Online	Student Academic Management System
Report Marking	No	Yes	Yes	Yes
Manage Academic Report	No	Yes	Yes	Yes
Generate Report	Yes	Yes	Yes	Yes

Student's Profile Management	Yes	No	No	Yes
Teacher's Profile Management	Yes	No	No	Yes
Tuition Record Management	Yes	No	No	Yes
Admin Dashboard	No	Yes	Yes	Yes
Generating Timetable	No	No	No	Yes
View Timetable	No	No	No	Yes
Centralized Database	Yes	Yes	Yes	Yes
Attendance Record Management	No	No	Yes	Yes
Multiple User role type Access	Yes	Yes	No	Yes

2.6 Literature Review of Technology Used

In this part development tools and technology used for the proposed system will be examined.

2.6.1 PHP

The proposed system will be developed using PHP which is a server scripting language that is fast, flexible, pragmatic, and suitable for web applications such as the proposed system. This language will also be used in conjunction with its framework which will be explained below.

2.6.2 Vue.js + Tailwind

Vue.js and Tailwind will be used as the front-end of the system. Vue.js is a JavaScript framework that builds on top of vanilla HTML, CSS, and JavaScript. It

covers most of the basic or common features that are needed for front-end development. It is very flexible and can be used in many ways. As for Tailwind, it is a CSS framework that can be used for rapidly developing user interfaces. With these two combined it should be sufficient to develop the front-end.

2.6.3 Laravel

Laravel is one of the most popular frameworks for PHP. It will be mainly focused on the backend side of the system such as database, and authentication among other things. By using Laravel it means that the development will follow along with the MVC (Model View Controller) architecture. Using MVC as its architecture and design pattern will have some benefits such as faster development and easier to organize a large-size web application. Its large library of packages/API will help the development immensely to cut down some of the basic functions.

2.6.4 Visual Studio Code

Visual Studio Code is the choice for a code editor in this development of the Student Academic Management System. This code editor must be not too unfamiliar among developers because it is one of if not the most popular code editor software. Not only because it supports multiple languages but also has a large collection of extensions that makes coding easier and manageable.

2.6.5 PostgreSQL

PostgreSQL is an open-source relational database that has many features and is highly extensible. It can handle small or bigger datasets while still maintaining security and performance. It is also the only relational database that meets the SQL:2016 Core conformance.

2.6.6 pgAdmin

Since the development will be using PostgreSQL as the database it is only logical to also use the most popular tools for this open-source relational database.

pgAdmin is the tool for managing PostgreSQL, it is included with a convenient UI thathelps and simplifies creating, maintaining, and using the database.

2.6.7 Amazon S3

Amazon S3 is an object storage service from the tech giant Amazon that provides cloud storage with industry-leading in scalability, data availability, security, and performance. It is also cost-effective compared to other cloud storage and also configurable in such a way that meets the needs of stakeholder's requirements.

2.6.8 Amazon Elastic Compute Cloud (Amazon EC2)

Amazon EC2 is a web hosting provided by amazon. It is used by many big company names such as Netflix, Twitch, and LinkedIn. It is mainly for enterprise websites that usually have a lot of traffic to handle.

2.7 Chapter Summary

This Chapter mainly covers the case study which in this case is SMAS Muhammadiyah 1 and also their current system. Then there is the comparison betweenthe existing system that has similar functions and the field of the proposed system. Thetechnology that will be used in the development is also described in this chapter.

Chapter 2

ORIGINALITY REPORT

4%	4%	1%	0%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	umpir.ump.edu.my Internet Source	1%
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