

Design of Continuous Web APP: Guidance and Counseling Management Information System at SMKN 1 Purwakarta using Laravel Framework

Kornelius Rhesa Valdis Setyawan *

Information Systems & Technology Education Study Program, Universitas Pendidikan Indonesia, Purwakarta Campus, Purwakarta Regency, West Java Province, Indonesia.

Email: rhesakornelius@gmail.com

Muhamad Fahmi Rizal

Information Systems & Technology Education Study Program, Universitas Pendidikan Indonesia, Purwakarta Campus, Purwakarta Regency, West Java Province, Indonesia.

E-mail: fahmirizal450@gmail.com

Suprih Widodo

Information Systems & Technology Education Study Program, Universitas Pendidikan Indonesia, Purwakarta Campus, Purwakarta Regency, West Java Province, Indonesia.

E-mail: supri@upi.edu

Rizki Hikmawan

Information Systems & Technology Education Study Program, Universitas Pendidikan Indonesia, Purwakarta Campus, Purwakarta Regency, West Java Province, Indonesia.

E-mail: hikmariz@upi.edu

Received: 20 November 2023; Accepted: 28 November 2023; Published: 20 December 2023.

Abstract: An Information System plays a crucial role in addressing the challenges associated with archiving guidance and counseling reports, thereby enhancing the quality of Guidance and Counseling Services at SMKN 1 Purwakarta. This research aims to develop a web application that not only streamlines the archiving process but also provides a foundation for future enhancements. The research process involves a comprehensive literature review, data collection, system analysis, system development, and report generation. Data acquisition encompasses both extensive literature searches and empirical fieldwork, involving interviews and direct observations of relevant stakeholders. The adoption of the Extreme Programming methodology is justified due to its efficiency in rapid software development and adaptability to changing requirements. Laravel, chosen as the framework, offers robust features, an active community, and continuous updates to support ongoing development. The outcome of this research is a Management Information System for guidance and counseling, leveraging Bootstrap for the frontend, Laravel for the backend, and MySQL for the database. The research also provides documentation for future improvements, including the results of black-box testing.

Keywords: Information System; Guidance and Counseling; Web Application; Extreme Programming; Laravel.

1. Introduction

Guidance and counseling services, as emphasized by specialists like Prayitno (2003) and Jainab Aqib (2010), play a pivotal role in nurturing students both individually and in groups, equipping them with the tools for growth and independence. According to the Ministry of Education and Culture Regulation No. 111 Year 2014 [1], guidance and counseling are defined as systematic, objective, logical, continuous, and planned efforts executed by guidance and counseling counselors or teachers to foster the development of students/counselees toward achieving independence in their lives. This process not only enhances self-perception, happiness, wellness, and mental clarity but also aids in the strategic planning of academic pathways [2].

The implementation of Guidance and Counseling programs necessitates the generation of reports for key stakeholders. This preparation, execution, and reporting of services are integral components of ensuring effective program evaluation. Timely, accessible, and accountable reports serve as a reflection of the quality and standards of organized Guidance and Counseling services, facilitating the observation of relationships and continuity between different service components [3]. Indonesian legislation, including Republic of Indonesia Law No. 89 of 1989 on the National Education System and Government Regulation No. 28 and 29 of 1990 on Basic Education and Secondary Education, underscores the significance of guidance and counseling services as an inseparable part of the Indonesian education system. Every student is entitled to receive guidance and counseling services during their educational journey, making these services indispensable for holistic student development and support [4]. Despite the critical role of guidance and counseling services, observations, and interviews at SMKN 1 Purwakarta reveal a reliance on physical books for archiving counseling reports, leading to time-consuming monthly reporting processes. These reports are typically transformed into electronic formats, adding complexity and potential data loss risks. Searching for specific student data within a large dataset can be a protracted endeavor. Consequently, the efficiency and speed of the reporting process have become concerns for guidance and counseling teachers. A solution is imperative to enhance process efficiency [5].

The adoption of an application designed to manage guidance and counseling archives emerges as the most practical solution. Such an application offers significant benefits, as evidenced in existing literature. For instance, "Rancang Bangun Sistem Informasi Bimbingan Konseling di SMK Tamansiswa Mojokerto Berbasis Web Menggunakan Model Waterfall" by Cahyadi, C. M., & Susanto, G [6], and the work of Putra and Novelan (2020), have demonstrated the effectiveness of counseling guidance applications, improving report compilation and storage, simplifying document format conversions, reducing data loss risks, enhancing data accessibility, and supporting targeted data searches [7]. Additionally, the integration of current technology enhances communication and data flow between system components. Automatic data analysis and updates further contribute to up-to-date information for improved decision-making.

Consequently, SMKN 1 Purwakarta intends to enhance guidance and counseling services through the development of a Counseling Guidance Management Information System, catering to the needs of teachers and stakeholders. In selecting the software development methodology, careful consideration led to the choice of the Extreme Programming Method. This decision aligns with the urgency and time constraints associated with the application's development, as Extreme Programming excels in adaptability to evolving requirements [8][9]. Laravel, an open-source PHP web application framework developed by Taylor Otwell, emerged as the ideal choice for this application's development. Laravel's expressive and elegant syntax, support for Continuous Integration and Continuous Development (CI/CD), and adherence to the Model-View-Controller (MVC) paradigm facilitate future development [10][11]. Evaluation parameters such as requests per second, memory usage, response time, and the number of required files demonstrate Laravel's superiority over competing MVC frameworks [12].

2. Research Method

The authors employed a diverse array of methodologies to meticulously gather essential data and information during the research phase, with the overarching aim of designing a web application tailored to ongoing guidance and counseling at SMKN 1 Purwakarta. The initial phase entailed rigorous field studies, necessitating on-site visits to SMKN 1 Purwakarta. This was undertaken to acquire comprehensive insights into the prevailing issues. Furthermore, the authors conducted extensive interviews, engaging with a cohort of guidance counselor teachers during this preliminary phase. Subsequently, the research progressed into the second phase, characterized by in-depth interviews. This phase was designed to yield an even deeper understanding of the intricacies of the guidance and counseling archiving process at SMKN 1 Purwakarta. It involved an exhaustive exploration of the knowledge related to guidance and counseling reports, their procedural intricacies, and their interconnectedness with stakeholders. In this phase, the authors conducted highly focused question-and-answer sessions with the guidance counselor teachers, delving further into the identified issues.

The culmination of the research effort was marked by the adoption of the literature study approach. In this phase, a comprehensive array of scholarly books and journals served as foundational references. This approach was instrumental in delving deeper into theoretical frameworks, providing a profound comprehension of the underlying concepts and ideas shaping the design of the guidance and counseling management information system at SMKN 1 Purwakarta. In parallel to these research methodologies, the authors employed the Extreme Programming (XP) methodology to design the guidance and counseling management information system. XP, characterized by its emphasis on simplicity and agility through concise development cycles [13], encapsulates a structured framework comprising twelve programming practices, five core values, and five fundamental rules, all converging towards a stringent yet quality-focused development process [14][15]. Within the research phase, the application of Extreme Programming (XP) ensured the active participation of all team members, facilitating an efficient and effective development process for the guidance and counseling management information system. Beyond efficiency, XP guaranteed the highest standards of software quality, while retaining the flexibility to adapt to evolving requirements [13][14][15].

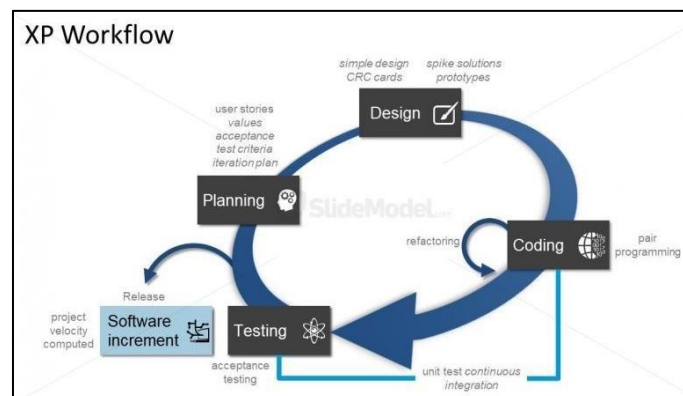


Figure 1. Extreme Programming (XP) Workflow [16]

This workflow elucidates the fundamental stages of Extreme Programming (XP), comprising Planning, Design, Coding, and Testing [16][17]. The initial phase, Planning, entailed collaborative meetings between stakeholders and the development team, aimed at articulating user needs through the formulation of user stories that meticulously delineate desired outcomes. Notably, direct observations were conducted at SMKN 1 Purwakarta, enabling the comprehensive understanding of system requisites. This phase encompassed contextual comprehension, output and feature identification, timeline and cost estimation, and the delineation of the developmental flow. The subsequent Design phase witnessed the development of a robust database, a meticulous use case diagram, and a low-fidelity prototype. Coding, constituting the pivotal third stage, represented the crucible of the entire lifecycle. Here, code was meticulously crafted, adhering to coding standards that align with core XP practices such as pair programming, metaphor adoption, continuous integration, refactoring, and code review with communal code ownership. In this exemplary instance, the guidance and counseling management information system found its form, drawing upon PHP as the programming language, Laravel as the PHP framework, and Bootstrap as the front-end framework. The conclusive phase of the XP workflow is Testing, a critical juncture where the system's functionalities were rigorously examined. This involved active user participation to validate that the system functioned in strict adherence to user-defined requirements. Employing the Blackbox approach, the system underwent meticulous scrutiny, affirming its seamless functionality.

3. Result and Discussion

3.1 Results

The design process of the guidance and counseling management information system at SMKN 1 Purwakarta, which includes database diagram, use case diagrams, low-fidelity prototype, and the application of the guidance and counseling management information system using the Laravel framework, are the obtained results of this research. Before we get into those process, let's go over the list of requirements.

3.1.1. List of Requirements

We compiled the following list of requirements based on the first and second interviews with four guidance counselor teachers from SMKN1 Purwakarta:

Table 1. List of Requirements

No.	User	Roles	Access Rights
1.	Admin	Managing master data related to student accounts, teacher accounts, academic year, student achievements, and all guidance and counseling reports.	Create, Read, Update and Delete (CRUD): <ol style="list-style-type: none"> 1. Student accounts 2. Guidance counselor teacher accounts 3. Academic years 4. Guidance and counseling reports 5. Student achievements Read only: <ol style="list-style-type: none"> 1. Total of guidance counselor teachers reports 2. Total guidance and counseling reports

2.	Teacher (Guidance Counselor Teacher)	Managing their own guidance and counseling report data and student achievements data.	Create, Read, Update and Delete (CRUD): <ol style="list-style-type: none"> 1. Guidance and counseling reports (only made by specific user) 2. Student achievements 3. Account profile Read only: <ol style="list-style-type: none"> 1. List of students 2. Student profile (without displaying their username and password) 3. Total guidance and counseling reports 4. Total of their guidance and counseling reports
3.	Student	Viewing their guidance and counseling report. Managing their student achievements data.	Create, Read, Update, and Delete (CRUD): <ol style="list-style-type: none"> 1. My student achievements 2. Account profile Read only: <ol style="list-style-type: none"> 1. My guidance and counseling reports (only made for specific user) 2. Total of my guidance and counseling reports 3. Total of my achievements
4.	Headmaster	Viewing all guidance and counseling reports and student achievements data.	Read only: <ol style="list-style-type: none"> 1. Guidance and counseling reports 2. List of students 4. Student achievements 5. Student profile (without displaying their username and password) 6. Total guidance and counseling reports 7. Total of guidance counselor teachers reports.

3.1.2. Database Diagram

In essence, a database diagram is an abstract graphical depiction of a database's structure. It can be used as a document that illustrates the structure of an existing database or as a tool to help in database design [18]. The database within the guidance and counseling management information system of SMKN 1 Purwakarta is represented physically in the database diagram that is displayed. In a particular DBMS, the physical diagram does indeed have all the information required to create a functioning database. It contains each attribute's specific data type.

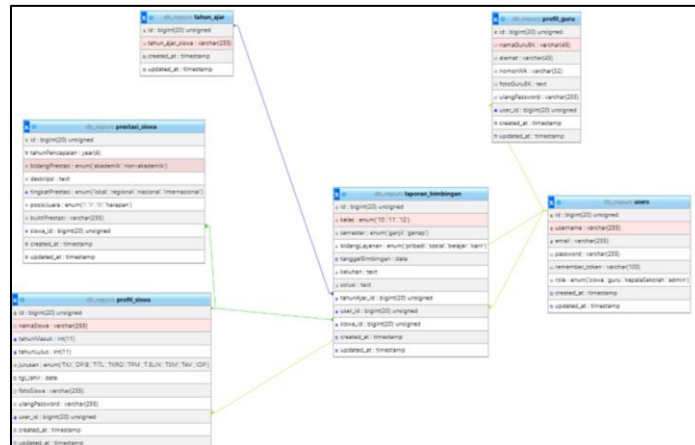


Figure 2. Physical Model Database

3.1.3. Use Case Diagram

A Use Case Diagram is a diagram that describes typical interactions between a user and a system by telling the story of how the system is used [19][20]. The use case diagram depicts an actor and the interactions they engage in. The actor can be a person, a piece of hardware, another system, or anything else that interacts with the system. Here is how the use case diagram appears:

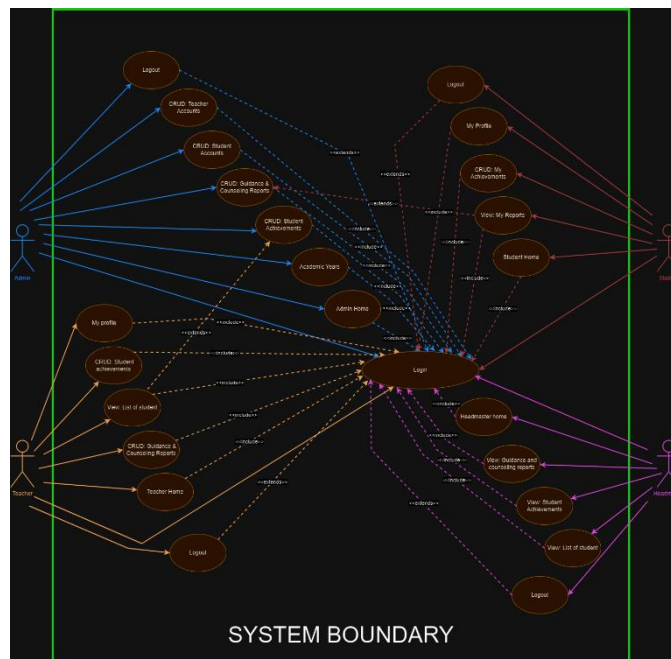


Figure 3. Use Case Diagram

In the use case diagram, there are four actors: an admin, a teacher (guidance and counselor teacher), a student, and the headmaster. To access the features listed in the list of prerequisites, any user with any role must first log in. Each user can log out after finishing, and logout will not occur if the login process has not occurred. The word 'extends' means that a process will not take place if the designated process does not run. Meanwhile, 'include' denotes that one process is a component of another [19].

3.1.4. Low Fidelity Prototype

A low-fidelity prototype is a simple diagram of an early-stage design concept. Low-fidelity prototyping drives ideation and innovation for basic page layout, content organization, and user flow [21][22]. Here is how the application appears, we divided it into four parts of dashboard based on the roles: admin, teacher, student, and headmaster and the login - logout system.



Figure 4. Low-Fi Login-Logout System

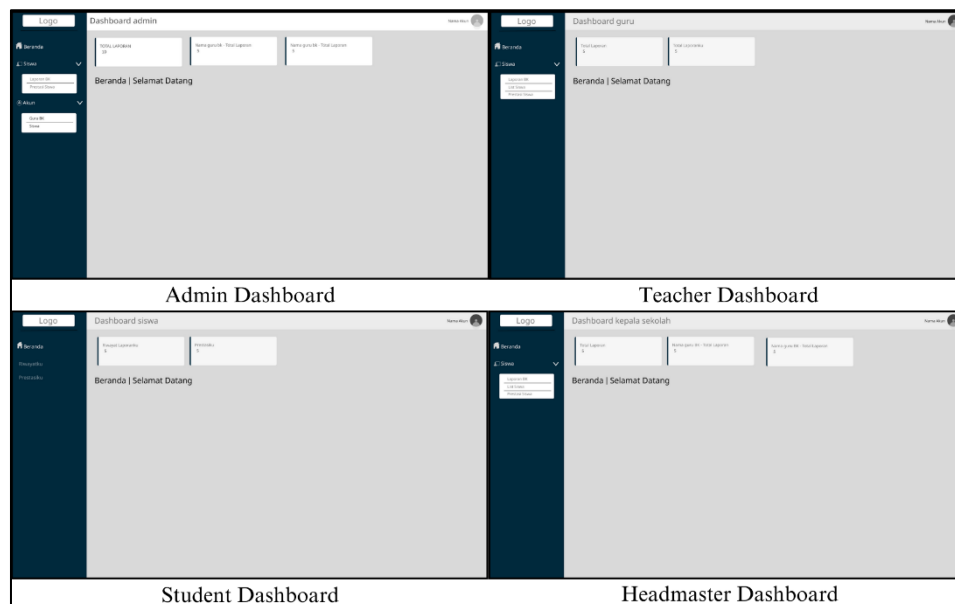


Figure 5. Low-Fi Dashboards

3.1.5. Program Implementation

As previously stated, the technology used in its development includes PHP with the Laravel framework for back-end, Bootstrap for front-end, and MySQL for the database. Not only that, to improve our table feature, including search box and export to PDF/Excel, we used Datatables, A JavaScript Library. In terms of functionality, this guidance and counseling management information system application at SMKN 1 Purwakarta adhered to the list of requirements in the previous stage, which were based on interviews with prospective users. To ensure that users do not encounter a language barrier when using our program, the language used in this application is Indonesian. Here is how the application appears:

3.1.5.1. General Features

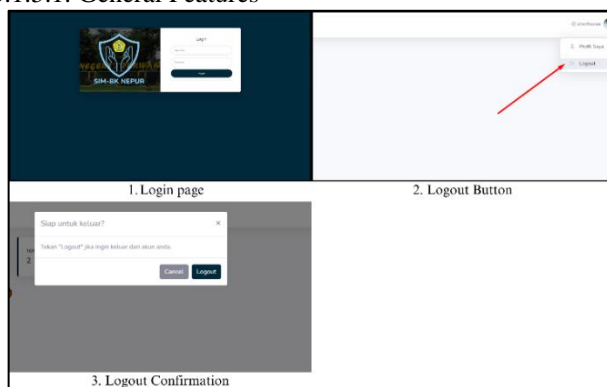


Figure 6. Login – Logout System

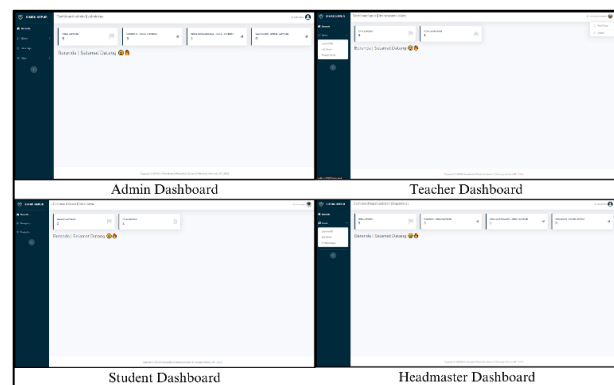


Figure 7. Dashboards

3.1.5.2. Admin Features

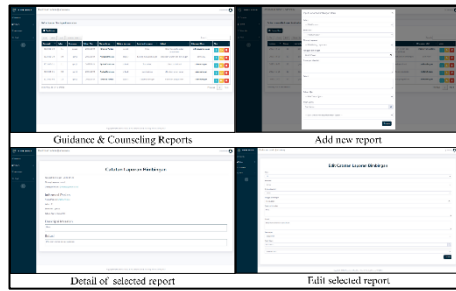


Figure 8. Guidance & Counseling Reports

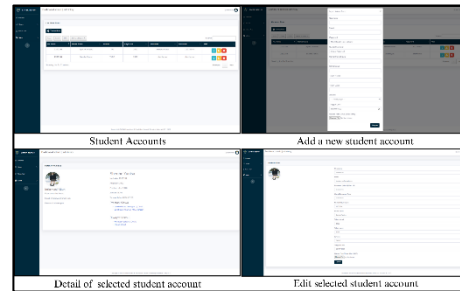


Figure 9. Student Accounts

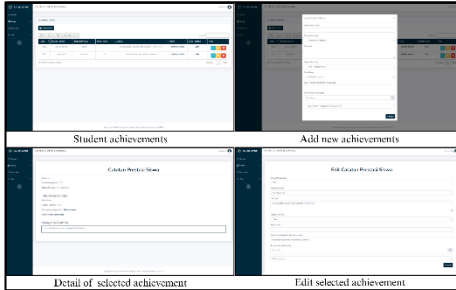


Figure 10. Student Achievements

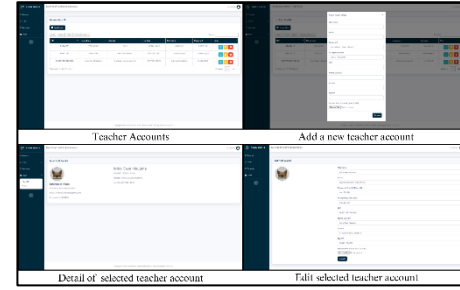


Figure 11. Teacher Accounts

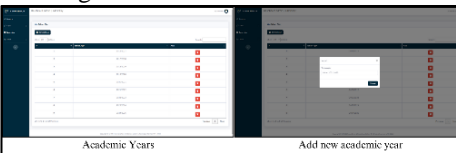


Figure 12. Academic Years

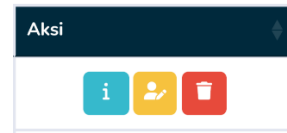


Figure 13. Detail Button (Cyan), Edit Button (Yellow), and Delete Button (Red)

3.1.5.3. Teacher Features

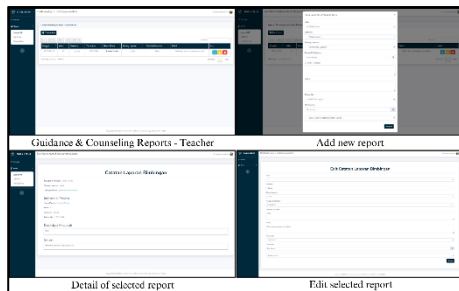


Figure 14. Guidance & Counseling Report - Teacher

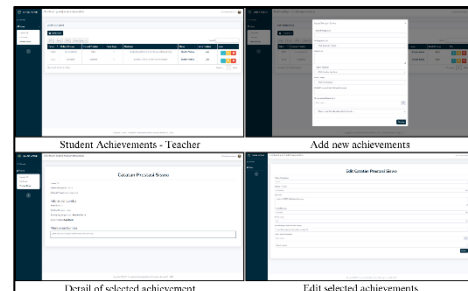


Figure 15. Student Achievements - Teacher

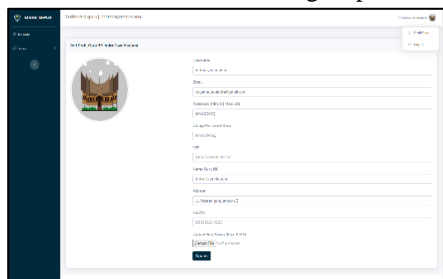


Figure 16. My Profile - Teacher

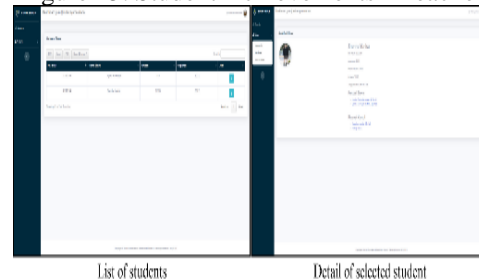


Figure 17. List of Students

3.1.5.4. Student Features

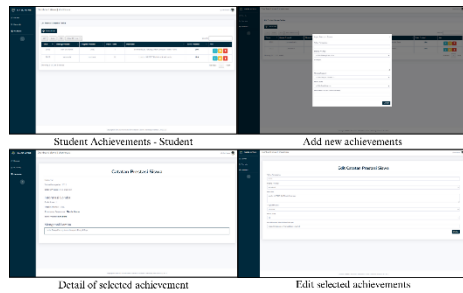


Figure 18. Student Achievements - Student

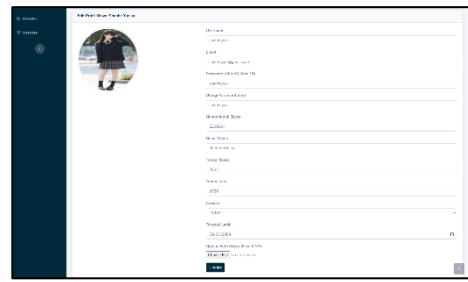


Figure 19. My Profile - Student

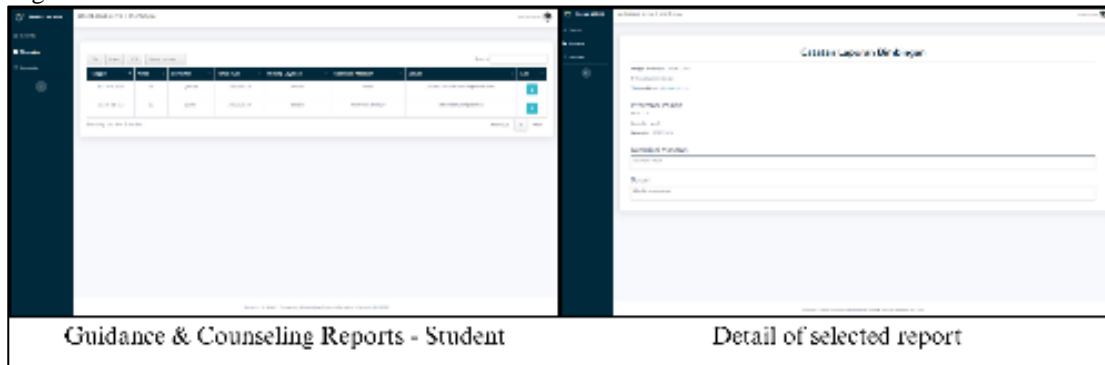


Figure 20. Guidance & Counseling Reports - Student

3.1.5.5. Headmaster Features

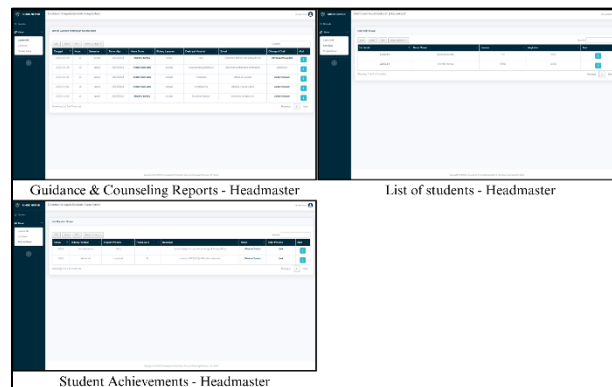


Figure 21. Headmaster Features – View Only

3.1.6. Implementation of Model-View-Controller (MVC) Paradigm

To ensure that our application may be expanded in the future, we adhere to the Laravel principles and use the Model-View-Controller paradigm. By using this paradigm, future developers will find it easier to understand the logic flow of the program, allowing for speedier application development [9].

3.1.6.1. Model

The Model component is the logic that is linked to the data about the consumers [23]. It is the pattern's core component and represents the data passed between the view and controller. Models are linked to application resources and frequently interact with database records. They are classes that represent application entities such as users, news items, and events.

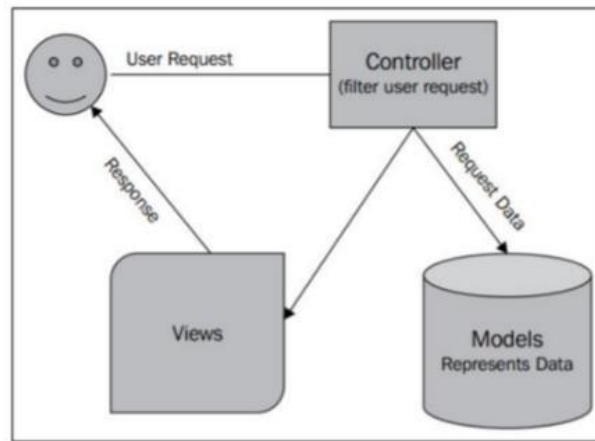


Figure 22. MVC Paradigm

Laravel includes Eloquent, an object-relational mapper (ORM) that allows developers to construct entities, assign them to related database tables, and use PHP functions instead of raw SQL statements. We can run efficient database queries with ORM without writing any SQL code. We also implemented those into our system:

```

<?php

namespace App\Models;

// use Illuminate\Contracts\Auth\MustVerifyEmail;
use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Database\Eloquent\Relations\HasMany;
use Illuminate\Foundation\Auth\User as Authenticatable;
use Illuminate\Notifications\Notifiable;
use Laravel\Sanctum\HasApiTokens;

class User extends Authenticatable
{
    use HasApiTokens, HasFactory, Notifiable;

    protected $fillable = [
        'username',
        'email',
        'password',
        'role'
    ];

    protected $hidden = [
        'password',
        'remember_token',
    ];

    protected $casts = [
        'email_verified_at' => 'datetime',
        'password' => 'hashed'
    ];

    // One to One dengan tabel profil guru
    public function profilGuru() {
        return $this->hasOne(ProfilGuru::class, 'user_id', 'id');
    }

    // One to One dengan tabel profil siswa
    public function profilSiswa() {
        return $this->hasOne(ProfilSiswa::class, 'user_id', 'id');
    }

    // One to Many dengan tabel laporan bimbingan
    public function laporanBimbinganFromUser() : HasMany {
        return $this->hasMany(LaporanBimbingan::class, 'user_id', 'id');
    }
}

```

Figure 23. User Model

```

<?php

namespace App\Models;

use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Database\Eloquent\Model;

class TahunAjar extends Model
{
    use HasFactory;

    protected $table = 'tahun_ajar';
    protected $primaryKey = 'id';
    protected $fillable = ['tahun_ajar', 'siswa'];

    public function laporanBimbingan() {
        return $this->hasMany(LaporanBimbingan::class, 'tahun_ajar_id', 'id');
    }
}

```

Figure 24. Academic Years Model

```

<?php

namespace App\Models;

use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Database\Eloquent\Model;

class Profile extends Model
{
    use HasFactory;

    protected $table = 'profile';
    protected $primaryKey = 'id';
    protected $fillable = ['user_id', 'username', 'password', 'email', 'role'];

    public function user() {
        return $this->belongsTo(User::class, 'user_id', 'id');
    }
}

```

Figure 25. Student Profile Model

```

<?php

namespace App\Models;

use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Database\Eloquent\Model;

class ProfileGuru extends Model
{
    use HasFactory;

    protected $table = 'profil_guru';
    protected $primaryKey = 'id';
    protected $fillable = ['user_id', 'username', 'password', 'email', 'role'];

    public function user() {
        return $this->belongsTo(User::class, 'user_id', 'id');
    }
}

```

Figure 26. Teacher Profile Model

```

<?php

namespace App\Models;

use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Database\Eloquent\Model;

class ProfileSiswa extends Model
{
    use HasFactory;

    protected $table = 'profil_siswa';
    protected $primaryKey = 'id';
    protected $fillable = ['user_id', 'username', 'password', 'email', 'role'];

    public function user() {
        return $this->belongsTo(User::class, 'user_id', 'id');
    }
}

```

Figure 27. Student Achievements Model

```

<?php

namespace App\Models;

use Illuminate\Database\Eloquent\Factories\HasFactory;
use Illuminate\Database\Eloquent\Model;

class LaporanBimbingan extends Model
{
    use HasFactory;

    protected $table = 'laporan_bimbingan';
    protected $primaryKey = 'id';
    protected $fillable = ['user_id', 'tahun_ajar_id', 'siswa_id', 'isi_laporan'];

    public function user() {
        return $this->belongsTo(User::class, 'user_id', 'id');
    }

    public function tahunAjar() {
        return $this->belongsTo(TahunAjar::class, 'tahun_ajar_id', 'id');
    }

    public function siswa() {
        return $this->belongsTo(ProfileSiswa::class, 'siswa_id', 'id');
    }
}

```

Figure 28. Guidance & Counseling Reports Model

3.1.6.2. View

The views oversee presenting the controller's response in an appropriate format, typically a webpage [23]. Regular PHP scripts or the Blade template language can be used to create them with ease. The most frequent item to return from the routes is the view. By pulling data from controllers or routes and injecting it into a template, views aid in the division of presentational logic from business logic. The resources/views directory contains the Blade template views.

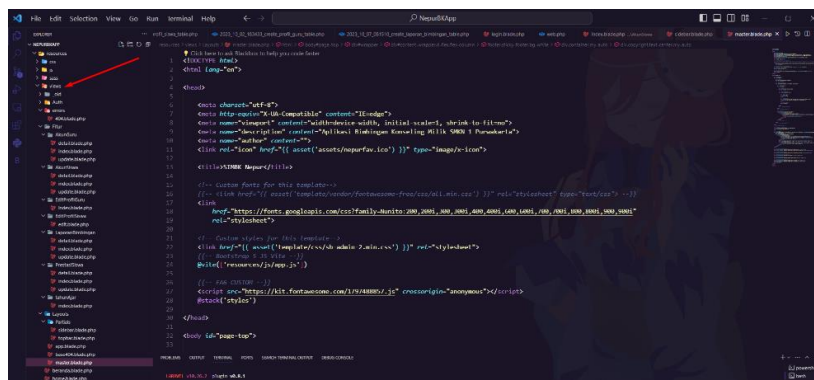


Figure 29. Implementation of Blade Template views

3.1.6.3. Controller

The controller in an MVC architecture manages the dataflow between the views and datasets. The users are transported to the presentation layer by means of this method. After receiving requests, the controllers handle them and reply with the proper information. The controllers handle duties like retrieving data from databases, processing data that is received via forms, and entering data into databases. The app/http/controller's directory contains the controllers.

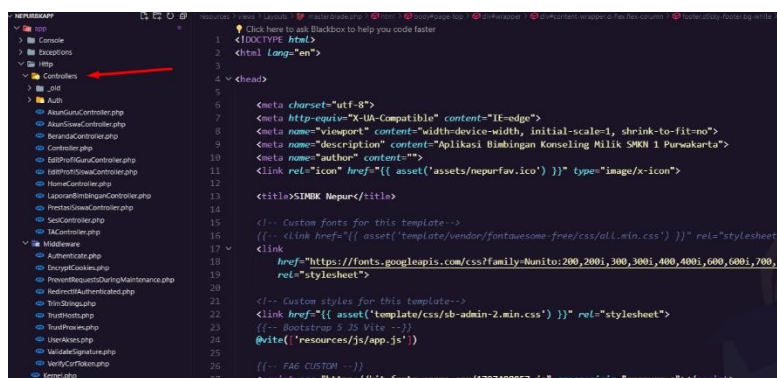


Figure 30. Implementation of Controllers

3.1.7. Testing

The Blackbox technique was chosen as our testing method, with feature functionality as our top priority, and due to limited knowledge of programming from the potential users. This testing process is repeated twice since the application is built using the Extreme Programming Method, which allows for iterations if the results do not satisfy the expectations of potential users. Here are the results of our preliminary testing:

Table 2. Testing Results

Roles	Features	Success/ Fail
Admin	Login	Success
	Guidance & Counseling Reports	Success, with revision
	Student Achievements	Success, with revision
	Academic years	Success
	Student Accounts	Success, with revision
	Teacher Accounts	Success
	Login	Success
Teacher	Guidance & Counseling Reports	Success, with revision
	List of Students	Success, with revision
	Student Achievements	Success, with revision
	My Profile	Success
Student	Login	Success
	Guidance & Counseling Reports	Success, with revision
	Student Achievements	Success, with revision
Headmaster	View of Guidance & Counseling Reports	Success, with revision
	View of Student Achievements	Success, with revision
	View of Student Lists	Success, with revision

From the initial testing, four issues need to be addressed:

Table 3. Issues Identified in Initial Testing

No.	Revisions
1.	It is recommended to have a feature to export files from the table for printing in PDF/Excel format.
2.	The label for entering “Keluhan” is changed to “Deskripsi Masalah”.
3.	The counseling history of students should appear for each student account without having to search first.
4.	The label for entering the NUPTK number is changed to the NIP number (Teacher features).

We did another test of the application after completing the adjustments from SMKN1 Purwakarta to measure the response from our prospective users. The outcomes of the second testing are as follows:

Table 4. Second Testing Results

Roles	Features	Success/ Fail
Admin	Login	Success
	Guidance & Counseling Reports	Success
	Student Achievements	Success
	Academic years	Success
	Student Accounts	Success
	Teacher Accounts	Success
Teacher	Login	Success
	Guidance & Counseling Reports	Success
	List of Students	Success
	Student Achievements	Success
	My Profile	Success
Student	Login	Success
	Guidance & Counseling Reports	Success
	Student Achievements	Success
Headmaster	View of Guidance & Counseling Reports	Success
	View of Student Achievements	Success
	View of Student Lists	Success

SMKN 1 Purwakarta expressed pleasure with our improved application during this second testing and hopes that it would be launched soon and used by them in the future.



Figure 22. First Testing



Figure 23. Second Testing

3.2. Discussion

A set of conditions that successfully execute the outcomes of discussions with the school is obvious from the research done at SMKN 1 Purwakarta. The foundation for creating a relational database diagram, which in turn serves as the basis for creating a use case diagram, is this list of requirements. The front-end display's initial flow for the Guidance and Counseling Management Information System at SMKN 1 Purwakarta is shaped by this use case diagram. Based on the front-end display that the user will see, changes are done on the back end, more precisely the controller. Each user role's requirements are considered while organizing the many functions that are displayed. This application's features include guidance and counseling reports, student successes, a list of students, academic years, teacher accounts, and student accounts, to name a few. The program was built with the Extreme Programming (XP) technique, with a focus on quality, productivity, and customer satisfaction. This application makes use of PHP with the Laravel framework for the backend, Bootstrap for the front end, and MySQL for the database. To increase table features, a JavaScript Library is utilized, which includes a search bar and the option to export papers in Excel/PDF format. Model-View-Controller (MVC) paradigm is used for future development purpose. During the testing phase, the Blackbox method was used to evaluate

the application's functionality as the major focus. Overall, testing was carried out twice. The first round of testing produced satisfactory results, while some feature modifications were required. All these adjustments were handled and presented in the second testing phase, which eventually suited the needs of the stakeholders at SMKN 1 Purwakarta.

4. Related Work

The findings of this study align closely with a body of relevant research in the domain of web-based guidance and counseling management information systems. Previously, Kahfi Rajab A, Syamsurijal M, Satria G, and Zain M (2023) successfully designed an effective and efficient web-based guidance and counseling management information system [4]. Similarly, Purwa Hasan Putra and Muhammad Syahputra Novelan (2020) undertook the development of a guidance and counseling management information system in their research [24]. Furthermore, the study conducted by Raisman Adhitya, Fahrullah, and Dedy Mirwansyah (2022) also centered around the same subject matter [25]. Remarkably, all three of these investigations culminated in successful and efficient applications, as evidenced by the conclusions drawn from Blackbox testing. In our own research, we have similarly employed the Blackbox methodology. Regrettably, one of these three studies remains unidentified. Rectifying this gap is of paramount importance, as it will enable future developers to seamlessly build upon the knowledge and advancements garnered in these prior endeavors. Consequently, the primary objective of our study is to bridge these gaps left by previous research by imparting insights into the utilization of the PHP Laravel framework and the Model-View-Controller (MVC) architecture. Moreover, our study has distinguished itself by employing the Extreme Programming Method, in contrast to the Waterfall Method employed by others in the construction of similar applications.

5. Conclusion

According to the findings of the research conducted at SMKN1 Purwakarta, the web-application "Design of Continuous Web App: Guidance and Counseling Management Information System at SMKN 1 Purwakarta Using Laravel Framework" was successfully implemented using a list of requirements, database diagram, use case diagram, and low-fi prototype. Guidance and counseling reports, student accomplishments, a list of students, academic years, teacher accounts, and student accounts are just a few of the features of this application. The Extreme Programming (XP) technique was used to create the application, with a focus on quality, productivity, and customer happiness. For the backend, this application uses PHP using the Laravel framework, Bootstrap for the front end, and MySQL for the database. A JavaScript Library is used to enhance table functionality, such as a search bar and the ability to export documents in Excel/PDF format. The Model-View-Controller (MVC) paradigm is being adopted for future development. The Blackbox method was utilized as the primary emphasis during the testing process to evaluate the application's functioning. Overall, testing was done twice. The first round of testing yielded satisfactory results, while some feature changes were required. All these changes were managed and presented during the second testing phase, which ultimately met the needs of the stakeholders at SMKN 1 Purwakarta, an information system that handle problems with archiving guidance and counseling reports at SMKN 1 Purwakarta. The testing results provide information about program functionality from testing phases to future developers if they would like to improve the same application.

References

- [1] Permendikbud Nomor 111 Tahun 2014 Tentang Bimbingan dan Konseling Pada Pendidikan Dasar dan Pendidikan Menengah. 2014. Available at: <https://jdih.kemdikbud.go.id/sjdih/siperpu/dokumen/salinan/Permendikbud%20Nomor%20111%20Tahun%202014.pdf>
- [2] Pentingnya Bimbingan dan Konseling dalam Implementasi Kurikulum Merdeka - Direktorat SMP. (n.d.). Available at: <https://ditsmp.kemdikbud.go.id/pentingnya-bimbingan-dan-konseling-dalam-implementasi-kurikulum-merdeka/>
- [3] Kementerian Pendidikan Dan Kebudayaan Direktorat Jenderal Guru Dan Tenaga Kependidikan. (2016). Panduan Operasional Penyelenggaraan Bimbingan Dan Konseling Sekolah Menengah Kejuruan (SMK).
- [4] Kahfi Rajab, A., Syamsurijal, M., Satria, G., Zain, M., & Makassar, U. N. 2023. Pengembangan Sistem Informasi Bimbingan dan Konseling di SMK Negeri 2 Makassar. UNM of Journal Technological, 7(1).

- [5] Cahyadi, C. M., & Susanto, G. 2020. Rancang Bangun Sistem Informasi Bimbingan Konseling di SMK Tamansiswa Mojokerto Berbasis Web Menggunakan Model Waterfall. 2(1). Available at: <https://ejournal.unikama.ac.id/index.php/jtst/article/view/4154/2560>
- [6] Shrivastava, A., Jaggi, I., Katoch, N., Gupta, D., & Gupta, S. 2021. A Systematic Review on Extreme Programming. Journal of Physics: Conference Series, 1969(1). DOI: <https://doi.org/10.1088/1742-6596/1969/1/012046>
- [7] Fenardi, O., & Lee, F. S. 2023. Aplikasi Akademik Berbasis Website Menggunakan Metode Extreme Programming Pada SMAN1 Belinyu. Jurnal Teknologi Dan Sistem Informasi Bisnis, 5(4), pp.440–447. DOI: <https://doi.org/10.47233/jteksis.v5i4.843>
- [8] Purnama Sari, D., & Wijanarko, R. 2019. Implementasi Framework Laravel pada Sistem Informasi Penyewaan Kamera (Studi Kasus Di Rumah Kamera Semarang). 2(1), pp.32–36. Available at: <https://core.ac.uk/download/pdf/322595458.pdf>
- [9] Laravel. 2023. Laravel Official Site. Available at: <https://laravel.com/docs/10.x>
- [10] Ram, M. 2023. The Benefits of Continuous Integration and Deployment with Laravel | Medium. Available at: <https://medium.com/@mukesh.ram/the-benefits-of-continuous-integration-and-deployment-with-laravel-350544ebde3a>
- [11] Anushka, V. 2023. Benefit of using MVC | GeeksforGeeks. Available at: <https://www.geeksforgeeks.org/benefit-of-using-mvc/>
- [12] Laaziri, M., Benmoussa, K., Khouliji, S., & Kerkeb, M. L. 2019. A Comparative study of PHP frameworks performance. Procedia Manufacturing, 32, pp.864–871. DOI: <https://doi.org/10.1016/j.promfg.2019.02.295>
- [13] Venema, M. 2023. What Is Extreme Programming (XP)? - Values, Principles, And Practices. Available at: <https://www.nimblework.com/agile/extreme-programming-xp/>
- [14] Beck, K., Jeffries, R., Hendrickson, C., & Martin, R. C. 2003. Extreme Programming Refactored: The Case Against XP. Apress.
- [15] Wallace, Doug., Raggett, Isobel., & Aufgang, Joel. 2003. Extreme programming for Web projects. Addison-Wesley.
- [16] Hakim, L., Kristanto, S. P., Yusuf, D., & Rifqi, M. M. 2021. E-Ticket Application as Supporting Technology During COVID-19 Pandemic in Baluran National Park. INTEK: Jurnal Penelitian, 8(1), DOI: <https://doi.org/10.31963/intek.v8i1.2307>
- [17] Kanade, V. 2022. Extreme Programming: A Comprehensive Guide - Spiceworks. Available at: <https://www.spiceworks.com/tech/devops/articles/what-is-extreme-programming/>
- [18] Mortier du, G. 2022. What Is a Database Diagram? | Vertabelo Database Modeler. Available at: <https://vertabelo.com/blog/what-is-database-diagram/>
- [19] Dicoding Intern. 2021. Contoh Use Case Diagram Lengkap dengan Penjelasannya - Dicoding Blog. Dicoding. Available at: <https://www.dicoding.com/blog/contoh-use-case-diagram/>
- [20] Kurniawan, T. B., & Syarifuddin. 2020. Perancangan Sistem Aplikasi Pemesanan Makanan dan Minuman pada Cafeteria No Caffedi Tanjung Balai Karimun Menggunakan Bahasa Pemograman PHP dan MYSQL. Jurnal TIKAR, 1(2). DOI: https://doi.org/10.51742/teknik_informatika.v1i2.153
- [21] Figma. 2023. Low-Fidelity Prototyping: What Is It and How Can It Help? | Figma. Available at: <https://www.figma.com/resource-library/low-fidelity-prototyping/>
- [22] Ramadhan, E. G. 2017. Low fidelity dan high fidelity Mockup | by Evan Gilang Ramadhan | UNIKOM Codelabs | Medium. Medium. Available at: <https://medium.com/codelabs-unikom/low-fidelity-dan-high-fidelity-mockup-a40f04b4af69>

- [23] Subecz, Z. 2021. Web-development with Laravel framework. *Gradus*, 8(1), pp.211–218. DOI: <https://doi.org/10.47833/2021.1.csc.006>
- [24] Putra, P.H. and Novelan, M.S., 2020. Perancangan Aplikasi Sistem Informasi Bimbingan Konseling Pada Sekolah Menengah Kejuruan. *Jurnal Teknovasi*, 7(1), pp.1-7.
- [25] Raisman Adhitya, Fahrullah, & Dedy Mirwansyah. 2022. Aplikasi Bimbingan Konseling Berbasis Web Di Smk Negeri 16 Samarinda. *Jurnal Informatika*, 1(2), 13–31. DOI: <https://doi.org/10.57094/ji.v1i2.358>.