



Guidance And Counseling System Design With UML

Ranti Eka Putri¹, Virdyra Tasril², Ayu Nadia Lestari³

^{1,3} Universitas Pembangunan Panca Budi, Indonesia

² Politeknik Negeri Medan, Indonesia

Corresponding Email: rantiekaputri@dosen.pancabudi.ac.id

Abstract.

This study aims to design a guidance and counseling system specifically for SMA Negeri 1 Binjai as an extension of a previous study conducted in 2023. The system is developed to enhance the efficiency and effectiveness of counseling services by facilitating better communication between students and guidance counselors. The design process utilizes Unified Modeling Language (UML), a standardized method that enables structured visual design and documentation of software systems. UML is applied through various diagrams, such as use case, and class diagrams, to ensure that the system's requirements and workflows are clearly visualized. The system design has been confirmed by the school as the end user, ensuring alignment with the specific needs of SMA Negeri 1 Binjai. With this design, it is expected that guidance and counseling services will become more responsive and supportive of students' needs in the educational environment. This research offers a practical contribution to the development of a technology-based guidance and counseling system that is relevant and can be widely applied in other high schools.

Keywords: Desain, Guidance, Counseling, UML

INTRODUCTION

This study aims to develop a guidance and counseling system better suited to the needs of students and counseling teachers (BK) at SMA Negeri 1 Binjai. In the previous study, the system was designed solely to support communication between counseling teachers and students through a chat feature. (R. Putri et al., 2023; R. E. Putri et al., 2022) However, after conducting interviews with the school, it became clear that the system needs further development to meet more complex requirements. The school requires additional features to help counseling teachers manage student disciplinary records, facilitate counseling sessions related to violations, record student data, and monitor counseling progress over time.

The primary motivation for this study is to provide an alternative facility for students to access guidance and counseling services without the negative stigma. Counseling rooms are often associated with disciplinary issues, which discourages some students from utilizing these services. By developing this system, it is hoped that students will feel more comfortable accessing guidance and counseling digitally.

As an initial step, this study designs the system using Unified Modeling Language (UML) to visualize the system's workflow. Using UML enables the school to more easily understand the structure and interaction between system components. This design will serve as a primary guide in the further development process, ensuring that the final system aligns closely with the school's needs and can be implemented effectively..

LITERATURE REVIEW

A system is a series of interconnected procedures that work together to achieve a specific goal. The word "system" originates from English, meaning a method or arrangement. Based on its approach, a system can be viewed from two perspectives: one that focuses on procedures and another that sees it as a collection of interacting elements working together to reach an objective (R. E. Putri & Karim, 2021)

Information is data that has been processed into a form that is more useful and meaningful for its recipient. (Afiah & Nugroho, 2021) Information is data that has been transformed into a more meaningful and useful form for its recipient to make present or future decisions. (Hardiman & Nugraha, 2018)

An information system is a framework designed to manage and process data, assist organizations in decision-making, and execute operations effectively. With interconnected components—such as hardware, specialized software, databases, and users who interact with the system—an information system serves as an integrated solution for efficient data management. In modern companies, this system supports various informational needs across all organizational levels, ensuring that data is well-stored, organized, and readily available to achieve shared goals. (R. E. Putri & Rachmatsyah Putra, 2023)

Guidance and counseling are essential components of the educational process as a system. Guidance serves as support for individuals facing various life challenges. Counseling, on the other hand, is an effort to assist someone through direct interaction between the counselor and the counselee. (Hasan Putra & Syahputra Novelan, 2020) The purpose of counseling is for the counselee to understand themselves and their environment, make appropriate decisions, and set life goals based on their personal values. (Mutia, 2021) With this support, the counselee is expected to experience

happiness and demonstrate more effective behavior. Ultimately, guidance plays a crucial role in supporting individuals to achieve optimal personal development in their social lives. Counselors provide various guidance and counseling services to students. These services are divided into several categories as follows (Prabowo et al., 2021)

1. Orientation Services
2. Information Services
3. Placement and Distribution Services
4. Content Mastery Services
5. Individual Counseling Services
6. Group Counseling Services
7. Group Guidance Services
8. Mediation Services
9. Consultation Services

UML, or Unified Modeling Language, is a system development technique that uses graphical language to document and detail system specifications. One of the advantages of using UML diagrams is their flexibility, allowing for a more detailed and in-depth depiction of software systems. (Pakaya et al., 2020) (Hendrawan et al., 2022) The use of UML helps illustrate the system design process, enabling the system to be developed and implemented more effectively. (Hendrawan et al., 2020) There are 13 types of diagrams in UML, divided into three main categories. Figure 1 shows the arrangement of diagrams in the Unified Modeling Language (UML). (Purnasari et al., 2022)

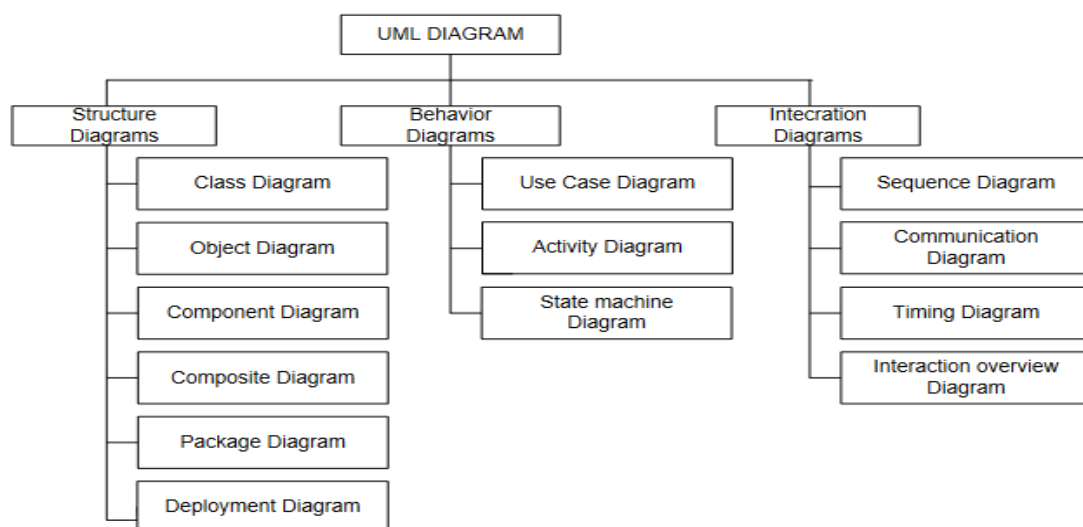


Figure 1. UML Diagram

Another perspective states that UML is a tool or model used for designing object-oriented software development. UML also provides a standard for creating system blueprints, covering aspects such as business process concepts, class definitions in specific programming languages, database schemas, and the components required in software systems. (Sonata, 2019)

METHODS

This study adopts a descriptive qualitative approach in designing a guidance and counseling system based on input from various stakeholders at SMA Negeri 1 Binjai. The design process begins with data collection through in-depth interviews with guidance and counseling (BK) teachers and several students. The purpose of these interviews is to identify user needs from both the BK teachers' and students' perspectives, so that the system design can fully reflect their requirements and preferences.

Based on the interview results, the system is then designed and visualized using Unified Modeling Language (UML). UML was chosen as it allows for a structured design that is easy for stakeholders to understand, especially in illustrating workflows, system structure, and component interactions. In this design process, several types of UML diagrams, including use case and class diagrams, are used to ensure that each desired process and function is well-represented.

Once the design is completed, these UML diagrams are confirmed with the school, particularly with the BK teachers who will be the primary users of the system. This confirmation ensures that the system design aligns with real needs and provides the school with a clear understanding of the workflows and features. Additionally, this step allows the researchers to gather direct feedback, which can be used to refine the design before moving into further system development.

The finalized design is expected to serve as a reference in developing a guidance and counseling system that is more effective than the previous one, which focused solely on simple communication features. With added functionalities for recording student data, managing violations, and tracking counseling progress, this system is expected to be more beneficial and supportive of the school's counseling services..

RESULTS

The following is the design of the guidance and counseling system, developed based on discussions and interviews with the school.

Usecase Diagram

The use case diagram for this guidance and counseling system is designed based on the roles or actors who can access it. This system involves three main actors: the super admin, counselor, and student, each with different access rights. The access rights and features available to each actor are detailed in Figures 2, 3, and 4.

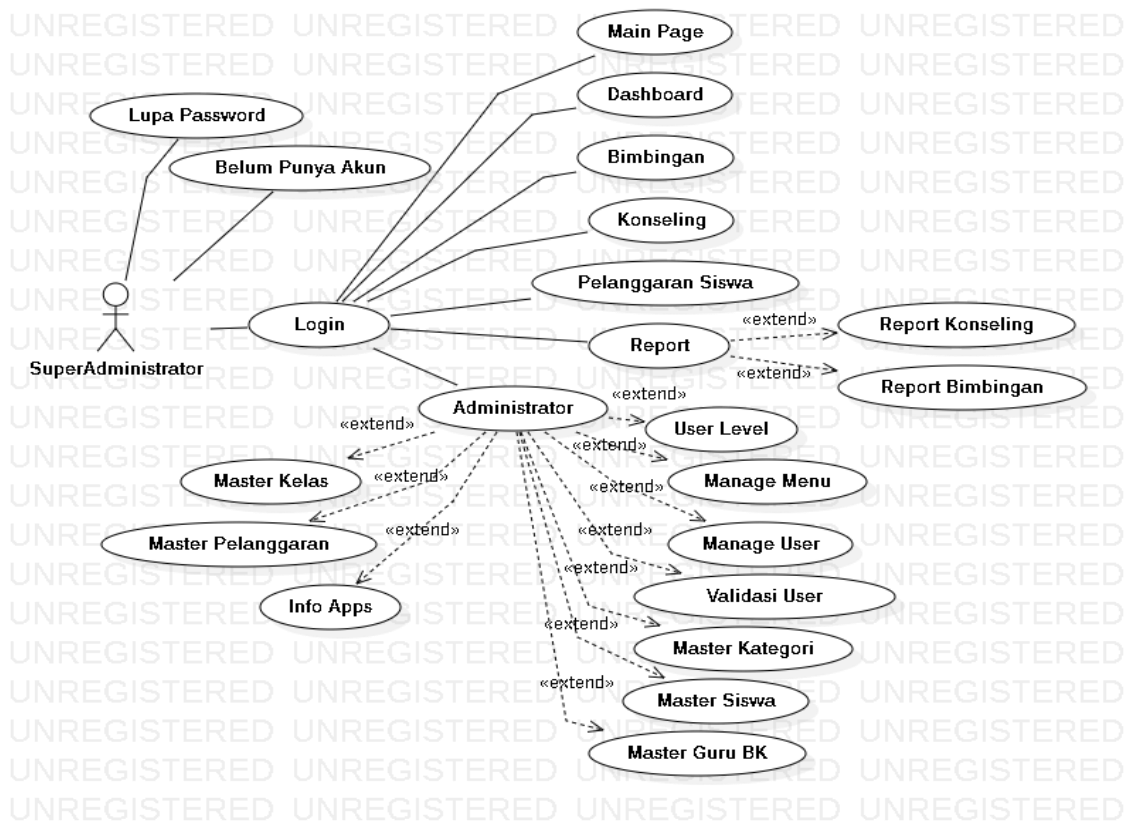


Figure 2. Usecase Super Admin

This use case diagram illustrates the various functions accessible to the Super Admin within the guidance and counseling system. The Super Admin has access to the "Administrator" menu, allowing for the management of critical data such as class information, violation records, and application details. Additionally, the Super Admin's role includes setting user access levels, managing menu options, validating accounts, and overseeing category, student, and counselor data. The Super Admin also has the right to

view counseling and guidance reports. This diagram emphasizes the Super Admin's role as the primary controller with full access rights to manage various aspects of the system.

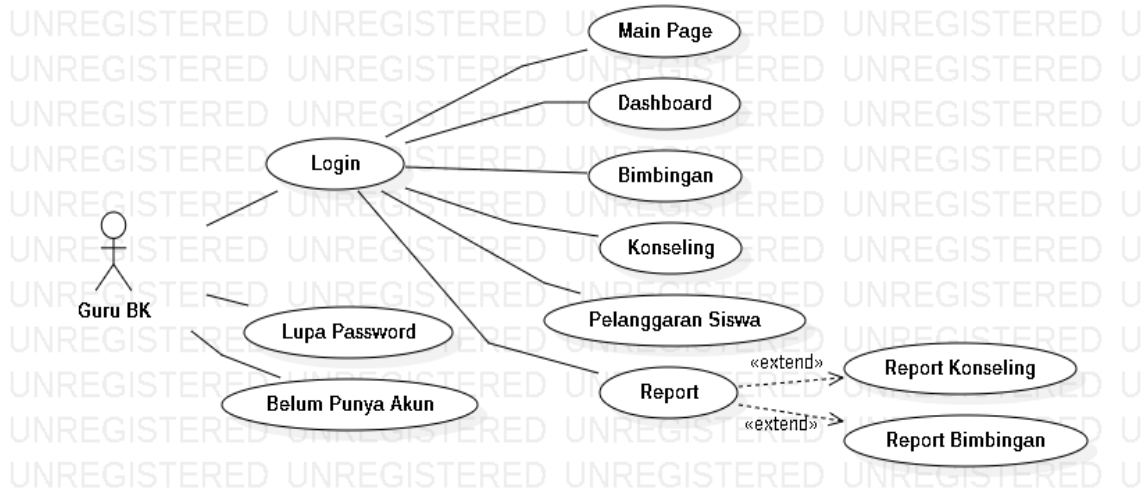


Figure 3. Usecase Counselor

Figure 3, the use case diagram, shows that the guidance and counseling (BK) teacher has several functions, including conducting guidance and counseling sessions, uploading records of student violations into the system, and viewing reports on both completed and ongoing counseling activities. The BK teacher's account is also equipped with a feature to address account recovery issues. Before accessing the guidance and counseling system page, the BK teacher is required to create an account, which will then be validated by the super admin. Once the validation process is complete, the BK teacher can access the system fully.

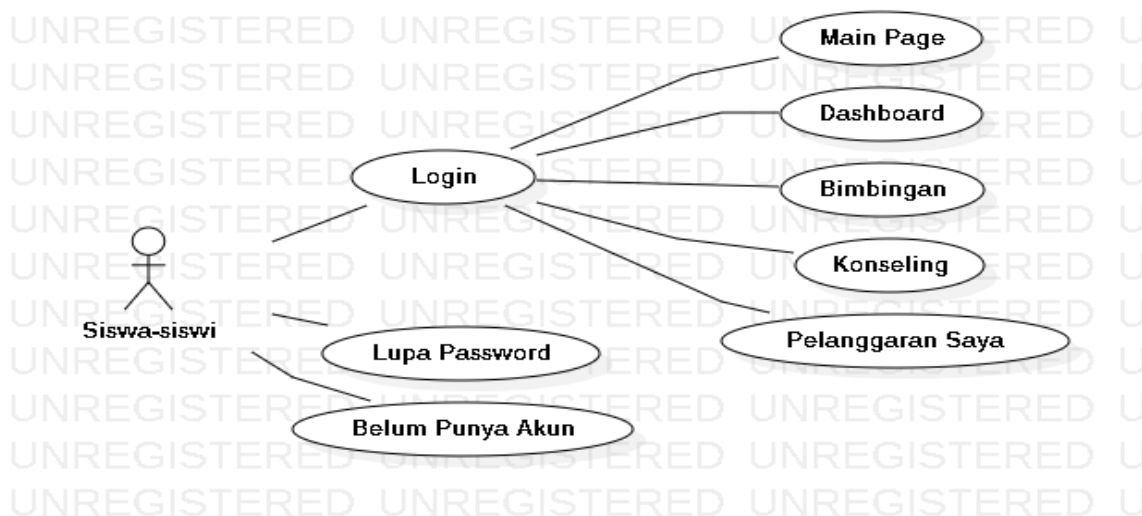


Figure 4. Usecase Student

Students are required to create an account in order to access the guidance and counseling services. Through their accounts in this system, students can receive guidance from the BK teacher and choose the desired BK teacher as their advisor. The counseling menu is intended for students to consult about violations they have committed with the BK teacher who has recorded those violations. Additionally, this system provides students with the convenience of viewing all the violations they have committed.

Activity Diagram

Figures 5, 6, and 7 are activity diagrams of the guidance and counseling system that illustrate the flow of activities for each actor in the designed system. These diagrams show how each flow begins, the possible decisions that can be made, and how the flow concludes. The activity diagrams also reflect parallel processes that can occur during multiple executions. Activity diagrams are a specific type of state diagram, where most of the states represent actions, and most transitions are triggered by the completion of the previous state or by internal processes that occur.

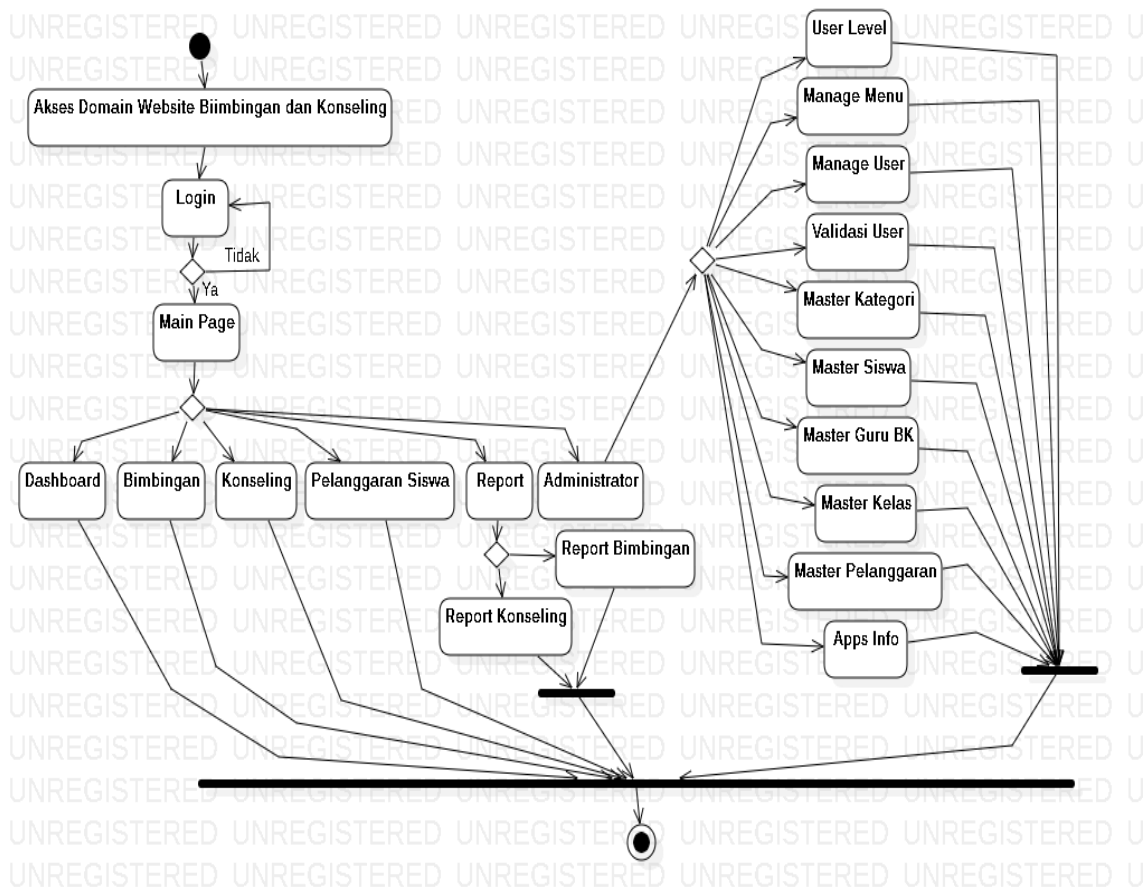


Figure 5. Activity Diagram Super Admin

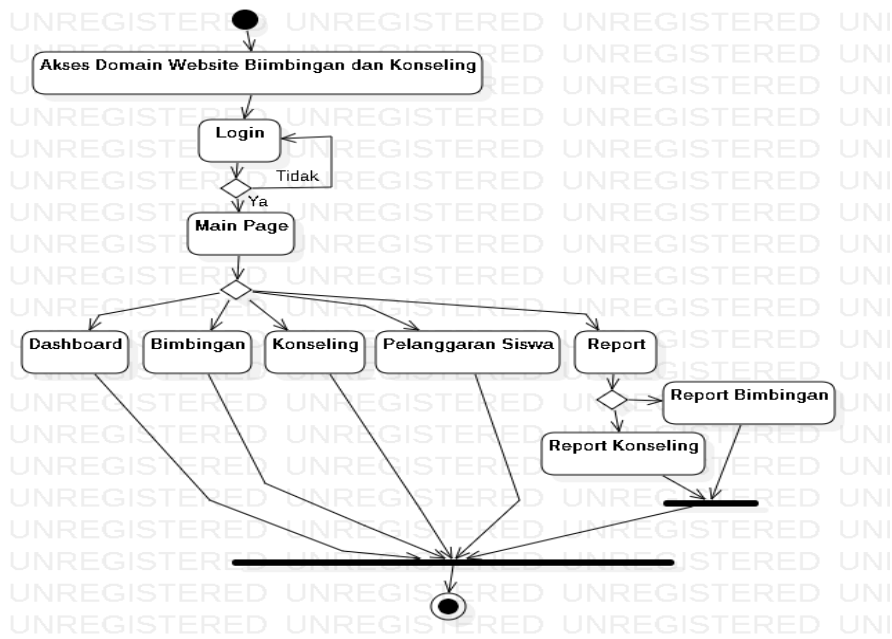


Figure 6. Activity Diagram Counselor

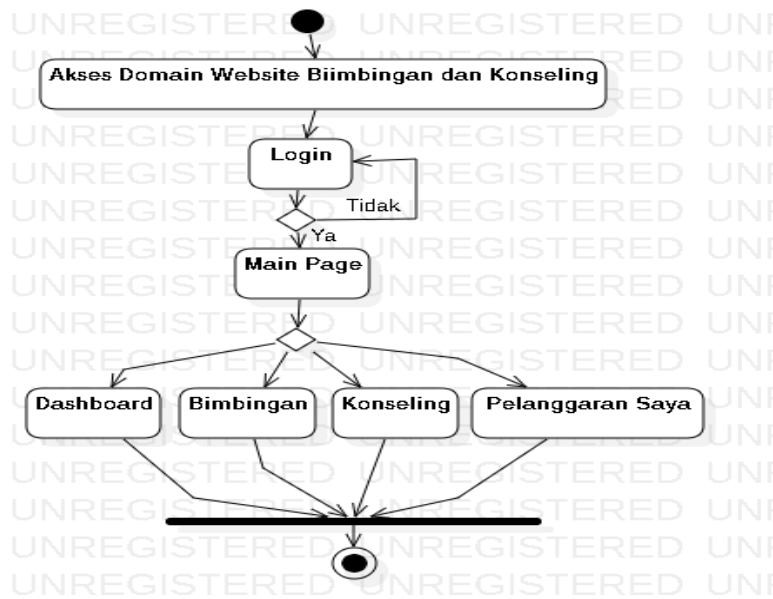


Figure 7. Activity Diagram Student

Class Diagram

The following is the class diagram of the guidance and counseling system, which illustrates the attributes, operations, and constraints applicable within the guidance and counseling system that will be designed and developed.

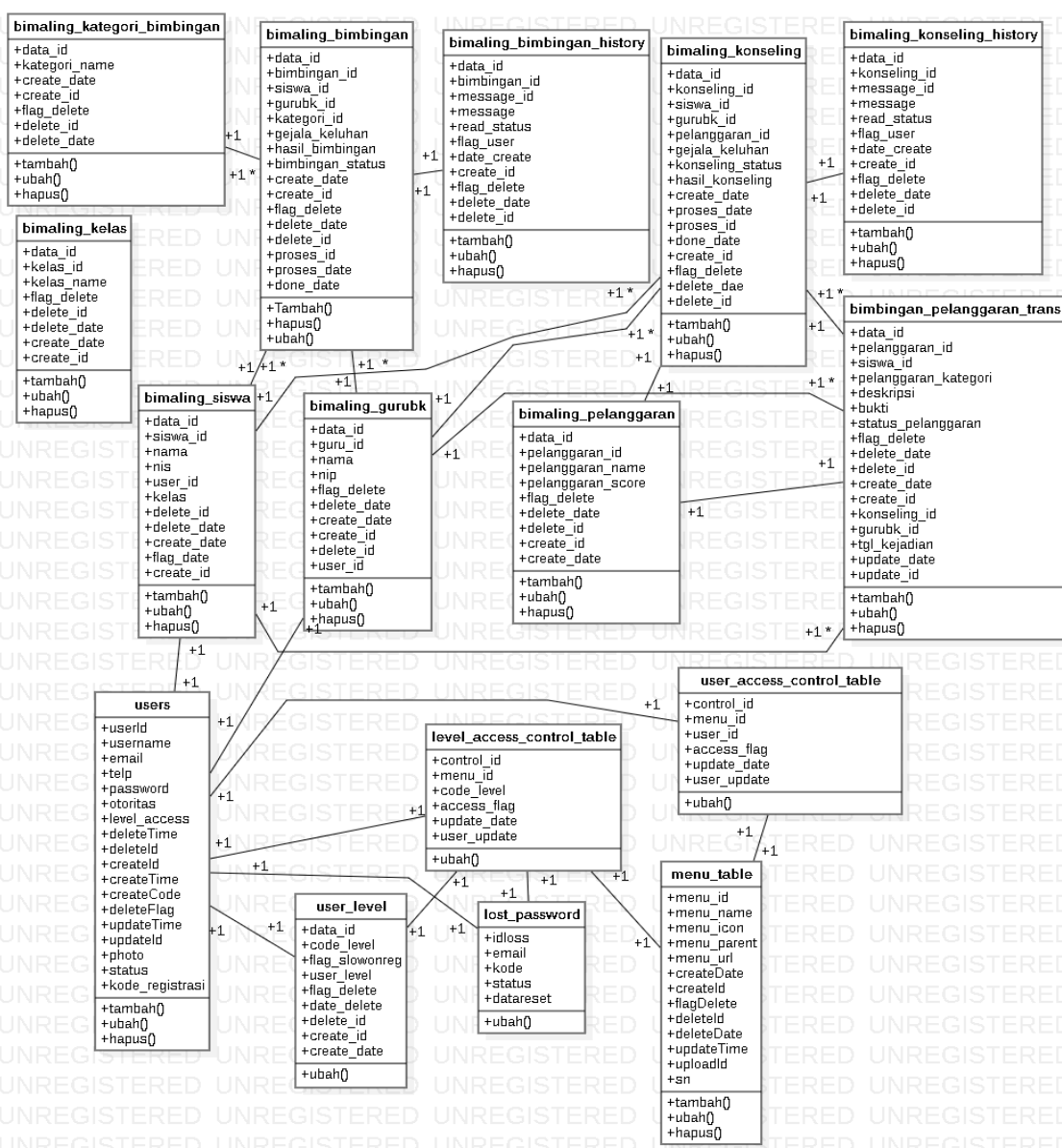


Figure 8. Class Diagram

DISCUSSION

This study aims to design an improved guidance and counseling system for students and counseling teachers (BK) at SMA Negeri 1 Binjai, building on findings from previous research that focused more on interaction through a chat feature. Through interviews with BK teachers and several students, the researchers identified additional necessary features, such as student violation management and counseling progress tracking. The use of UML to visualize this system design has been confirmed by the school, indicating that the design is relevant and easy to understand.

The primary contribution of this research is the application of technology to enhance the effectiveness of guidance and counseling services. This aligns with previous studies showing that interactive systems can increase student participation and provide better support. With the addition of new features, the researchers hope this system will not only serve as a communication platform but also as a management tool that aids BK teachers in data-driven decision-making. Overall, this study underscores the importance of a responsive, technology-based guidance system to support students' development within the school environment.

CONCLUSION

This research successfully developed a comprehensive design for a guidance and counseling system tailored to the needs of students and counseling teachers at SMA Negeri 1 Binjai. By utilizing UML for system design and conducting interviews with BK teachers and students, the researchers created a system that not only improves communication but also integrates essential features such as student violation management and counseling tracking. This approach ensures that the designed system is relevant and meets the practical needs of its users.

LIMITATION

Time and Resource Limitations: This study was conducted within a limited timeframe, which did not allow for a longitudinal study that could provide a more comprehensive picture of the development and implementation of the guidance and counseling system at SMA Negeri 1 Binjai.

REFERENCES

- Afiah, E. N., & Nugroho, A. C. (2021). Rancang Bangun Aplikasi Bimbingan Konseling Perkembangan Siswa Di Smp Swadhipa 1 Natar. *Teknologi Terkini*, 1(2), 1–11.
- Hardiman, M., & Nugraha, R. H. (2018). Pelanggaran Siswa Dan Bimbingan Konseling Pada Smpn 2 Sumberjaya Berbasis Decision Support System. *Industrial Research Workshop and National Seminar*, 358–365.

- Hasan Putra, P., & Syahputra Novelan, M. (2020). PERANCANGAN APLIKASI SISTEM INFORMASI BIMBINGAN KONSELING PADA SEKOLAH MENENGAH KEJURUAN. *Jurnal Teknovasi*, 07, 1–7.
- Hendrawan, J., Perwitasari, I. D., & Arifin, D. (2023). Aplikasi Kede Desa (KEDES) Untuk Digitalisasi UMKM Desa Klambir Lima Kebun. *KOMIK (Konferensi Nasional Teknologi Informasi dan Komputer)*, 6(1), 868-872.
- Hendrawan, J., Perwitasari, I. D., & Ramadhani, M. (2020). Rancang Bangun Sistem Informasi UKM Panca Budi Berbasis Website. *INTECOMS: Journal of Information Technology and Computer Science*, 3(1). <https://doi.org/10.31539/intecom.v3i1.1330>
- Mutia, S. (2021). “Pelaksanaan Program Layanan Bimbingan Dan Konseling Disekolah .” *Intelektualita* .2021. In *Intelektualita* (Vol. 7, Issue 01).
- Pakaya, R., Tapate, A. R., & Suleman, S. (2020). PERANCANGAN APLIKASI PENJUALAN HEWAN TERNAK UNTUK QURBAN DAN AQIQAH DENGAN METODE UNIFIED MODELING LANGUAGE (UML). *Jurnal Technopreneur (JTech)*, 8(1). <https://doi.org/10.30869/jtech.v8i1.531>
- Perwitasari, I. D., & Hendrawan, J. (2020). Rancang Bangun Sistem E-Posyandu Penjadwalan dan Monitoring Perkembangan Bayi Berbasis Android. *INTECOMS: Journal of Information Technology and Computer Science*, 3(1), 1-8.
- Prabowo, agung, Kiranasari, F., & Febriyanti, L. (2021). Implementasi Teknologi Dan Media Dalam Layanan Bimbingan Dan Konseling. *Jurnal Selaras : Kajian Bimbingan Dan Konseling Serta Psikologi Pendidikan*, 4(1).
- Purnasari, M., Hartiwi, Y., & Nurhayati, N. (2022). Perancangan Sistem Informasi Pengelolaan Dana Masjid Berbasis Web Menggunakan Unified Modeling Language (UML). *Resolusi: Rekayasa Teknik Informatika Dan Informasi*, 2(6). <https://doi.org/10.30865/resolusi.v2i6.416>
- Putra, R. R., Putri, N. A., & Wadisman, C. (2022). Village Fund Allocation Information System for Community Empowerment in Klambir Lima Kebun Village. *Journal of Applied Engineering and Technological Science (JAETS)*, 3(2), 98-104.
- Putri, R. E., Yusman, Y., & Pratama, Y. W. (2022). UI/UX Design of Early Childhood Learning Applications Using Figma: Perancangan UI/UX Aplikasi Pembelajaran Anak Usia Dini Menggunakan Figma. *SYSTEMATICS*, 4(3), 525-533.
- Putri, R. E., & Karim, A. (2021). Perancangan Aplikasi Penjualan Sepeda Motor Pada PT. Adira Finance Rantauprapat Dengan Menggunakan PHP dan MySQL. *INFORMATIKA*, 9(1). <https://doi.org/10.36987/informatika.v9i1.2066>

- Putri, R. E., & Rachmatsyah Putra, D. (2023). *DEVELOPMENT OF INFORMATION SYSTEM FOR ALUMNI DATA PROCESSING USING CAKEPHP FRAMEWORK*.
- Putri, R. E., Yusman, Y., & Puspita Sari, I. (2022). Perancangan Sistem Informasi Bimbingan Dan Konseling Berbasis Website. *Nasional Teknologi Informasi Dan Komputer*, 6(1). <https://doi.org/10.30865/komik.v6i1.5904>
- Putri, R., Widya, R., & Yusman, Y. (2023). PROTOTYPE SISTEM INFORMASI BIMBINGAN DAN KONSELING MENGGUNAKAN FIGMA. *Jurnal Indonesia : Manajemen Informatika Dan Komunikasi*, 4(2), 540–551. <https://doi.org/10.35870/jimik.v4i2.246>
- Sonata, F.-. (2019). Pemanfaatan UML (Unified Modeling Language) Dalam Perancangan Sistem Informasi E-Commerce Jenis Customer-To-Customer. *Jurnal Komunika : Jurnal Komunikasi, Media Dan Informatika*, 8(1), 22. <https://doi.org/10.31504/komunika.v8i1.1832>.
- Supiyandi, S., Rizal, C., Fachri, B., Eka, M., & Nasution, Y. R. (2022, December). Development Of A Village Information System Using The Spiral Method. In *International Conference on Sciences Development and Technology* (Vol. 2, No. 1, pp. 112-117).
- Yusman, Y., Putri, R. E., & Amelia, L. (2022). The Decision Support System for Selecting Village Head Candidates Using The AHP Method Is Implemented With Super Decision Software: Sistem Pendukung Keputusan Pemilihan Calon Kepala Desa Menggunakan Metode AHP Diimplementasikan Dengan Software Super Decision. *Systematics*, 4(3), 518-524.