Analysis and Design of a Web-Based Counseling Guidance Management Information System at ABC High School

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ABSTRACT

Counseling is a professional support process aimed at helping individuals or groups overcome various personal, emotional, social, or psychological problems. This process involves trained counselors who utilize specialized techniques to provide guidance, support, and advice, facilitating better coping mechanisms and overall well-being. Given the critical role of counseling in fostering mental health and personal development, it is essential to continually improve and enhance counseling services for students. By doing so, counselors can ensure they are providing the most effective and comprehensive support possible. At present, SMA ABC relies on traditional methods such as Microsoft Word and Microsoft Excel to record and store data related to counseling and guidance. While functional, these tools are not optimized for the dynamic and multifaceted nature of counseling work. This traditional approach can be time-consuming and prone to errors, hindering the efficiency and effectiveness of the counseling services provided to students. To address these challenges, a web-based management information system is needed. Such a system would streamline the process of recording, storing, and retrieving information, enabling counselors to complete their tasks more quickly, accurately, and on time. A well-designed web-based system would also facilitate better data analysis and reporting. The development of this system will use the waterfall method, a systematic and sequential approach to software development. This method ensures that all data and information related to the counseling procedures and the system's technical implementation are thoroughly processed and accurately integrated, resulting in a reliable and efficient management tool.

Keywords: Design, Counseling, Management Information Systems, Waterfall Method.

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INTRODUCTION

Computer technology is developing very rapidly nowadays, and almost every field of work uses it for data processing, including educational fields such as consulting services. Counseling is a professional support process aimed at helping individuals or groups overcome personal, emotional, social, or psychological problems[1]. In this process, the decision is in the hands of the supervisor and student, and they work together to find the best solution to the problem at hand. It is important to improve student counseling services so that counselors can provide the best services more effectively and efficiently[2].

Technology offers many benefits to people around the world, such as making it easier to access and search for information and increasing work efficiency. Currently, SMA ABC uses Microsoft Word or Microsoft Excel to record and store counseling referral data. However, this method is prone to

recording errors and takes a long time to obtain the required information. Therefore, we must optimize the counseling guidance recording process to avoid missing crucial data due to the overwhelming volume of data in the report[3], [4].

Management information systems are part of computer information systems that send information to users with the same needs. A number of components work together in this system to produce information useful for managing an organization or business[5], [6]. A management information system includes data collection, variation, and processing. This process allows the resulting information to be more accurate and easily accessible. This system produces information that enhances decision-making[7], [8].

The main goal of project management in developing this information system is to help the project complete quickly, on time, and in accordance with the expected results. Planning plays a crucial role in a project, as it requires meticulous planning to achieve the desired agreement. Good planning minimizes the risk of errors and increases work efficiency and effectiveness. A well-integrated management information system will be very helpful in improving the quality of counseling services at SMA ABC, ensuring that all important data is well recorded and easily accessible whenever needed.

LITERATURE REVIEW

According to Whitten and Bentley, the first step in system development is analysis and design. We carry out these steps to determine system requirements, overcome problems, and determine the type of system to build [9]. Pamungkas states that information systems are very useful for an organization or business because they can help them make fast, accurate, and precise decisions based on the information received [10]. According to Tantra, an information system is a systematic method for combining, entering, operating, storing, organizing, monitoring, and releasing data so that it can support a company or organization in achieving its goals [11]. According to Jogiyanto, an information system is a system in an organization that can meet daily transaction processing needs, assist operational and managerial work, as well as organizational program goals, and prepare the information required for certain external parties [12]. The author defines an information system as a series of procedures that integrate several sub-schemes to meet the needs of an organization or company by providing the necessary reports.

According to Raymond McLeod, Jr., a management information system is a computer-based information system that provides data to a number of users who have similar needs. The goal is to provide sophisticated and responsive data for all parts of the organization to ensure its continuity and existence [13]. According to Lisna Zahrotun, guidance and counseling are important components of a system's educational process. Guidance helps a person face difficulties and problems in life. On the other hand, counseling is an effort to assist someone through a personal interaction with a counselor. Counselors here aim to help individuals understand themselves, their environment, make decisions, and set goals based on their principles so that they feel happy and successful in their behavior [14].

METHODOLOGY

The waterfall method serves as a research method in the development of a guidance and counseling management information system, following a sequential stage-by-stage process. We must complete each stage of the waterfall method before moving on to the next, to prevent stage duplication.The waterfall method is a linear sequential model, also known as the classic life cycle. This method involves executing five rounds repeatedly. The waterfall method is based on an organization's or company's needs in processing data and information and involves technical procedures and work-related operations. The steps included in the waterfall method are as follows:
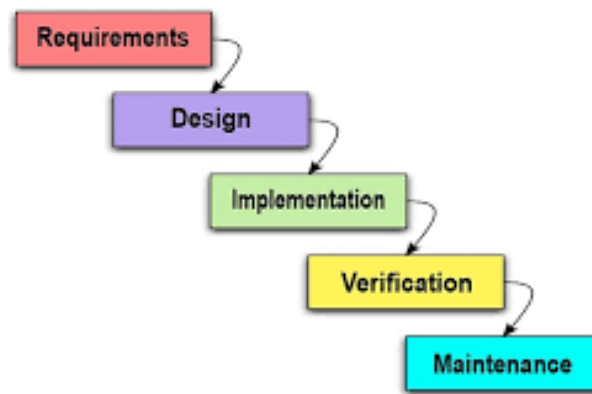
Figure 1. Waterfall System Development Method

At this stage, system developers must contact potential users to understand the desired software and existing constraints. Developers can collect this data through surveys, interviews, or direct discussions. Through this approach, developers can comprehensively identify user needs and expectations.

In the design stage, system developers create a system design that helps select the desired hardware, software, and overall system architecture. This design serves as a blueprint for further development and ensures that all system elements are well integrated.

During the implementation phase, the system initially introduces itself as small programs, or units. Then, these units are integrated. We develop and test each unit to ensure its functionality, a process known as "unit testing." This process guarantees the proper functioning of each component before merging them into a single, comprehensive system.

During the verification stage, we test the created system to confirm its compliance with the specified requirements. We divide testing into three categories: system testing, which concentrates on the code of a specific module, unit testing, which also targets a specific module, and acceptance testing, which collaborates with the customer to verify the fulfillment of all requirements. This stage is crucial to ensure the quality and reliability of the system.

The waterfall method's final stage involves the implementation and maintenance of the completed software. Correcting errors not detected in previous stages and making necessary adjustments are part of the maintenance process to ensure the system continues to run properly. Good maintenance ensures that software remains relevant and functions optimally over time.

RESULTS AND DISCUSSION

Information Systems Design

The guidance and counseling project management information system primarily serves three groups of users: students, school principals, and counselors. The system will offer guidance and counseling services to both students and counselors. The student actor logs in to the account. If the student actor does not yet have an account, they must first create one. Next, the counselor actor will follow the same steps as the student actor. Then students submit a request for a guidance schedule.

counseling to counselors. If we receive the application, we will approve the guidance schedule. Students can see the counselor's name displayed in the system. Next, the counselor can see the display as a counselor if they want to open it. The system will hold meetings for students seeking guidance. Therefore, the meeting can end when the student and counselor have finished. The counselor then prints the report results, presenting them to the school principal.
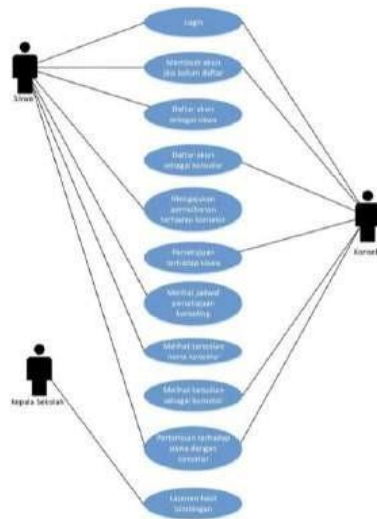
Figure 2. Use Case Diagram

Figure 3 shows the system's processes and the sequence of activities. We designed a database based on the managed data results and the desired information, creating three tables: counseling data, student data, and counselor data. The following Figure 4 displays the class structure, attributes, and relationships between classes.
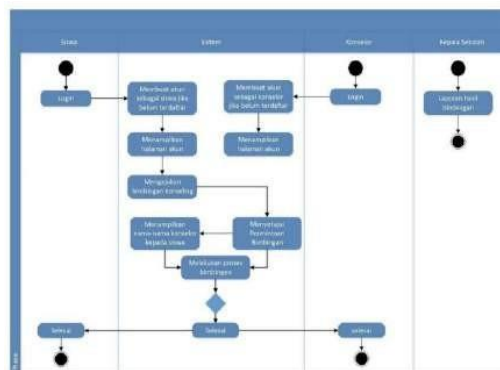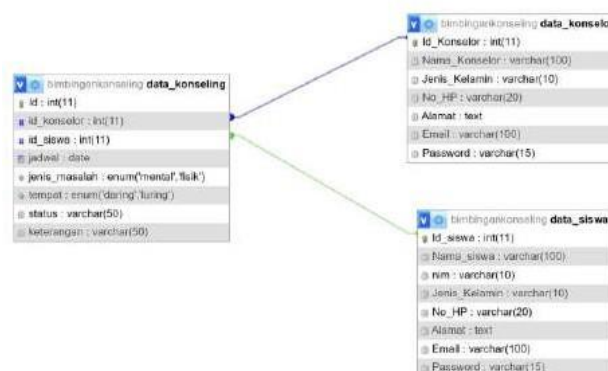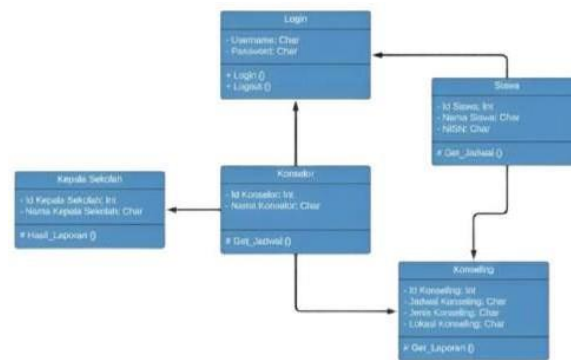

Figure 3. Activity Diagram

Figure 4. Sequence Diagram

System Implementation

This application will show a login page on the initial display, as seen in Figure 5. Users need to enter their email and password to log in, then click the login button. If the email and password entered are correct, the application will display a dashboard page that matches the user's access rights, as in Figure 8.

Figure 5. Class Diagram

This application will show a login page on the initial display, as seen in Figure 6. Users need to enter their email and password to log in, then click the login button. If the email and password entered are correct, the application will display a dashboard page that matches the user's access rights, as in Figure 8.

Figure 6. Login Page

If students do not have an account, they are directed to register as students. Students are required to fill in the student name table, gender table, NIS table, date of birth table, cellphone number table, address table, email table, password table, and password reset table. Then click Register.

Figure 7. Student Registration Page

This display instructs the student user to input the necessary information to create a counseling guidance schedule. In this display, students are required to enter the type of 22 problems, the location

and date of the counseling guidance, the counselor they have selected, and any additional information they may have. The user instructs the student to press the submit button to submit a counseling guidance schedule.

Figure 8. Student User Dashboard Page

The display allows the student user to view their submitted schedule and determine whether the counselor user has approved it or not. Students can also delete submitted or approved schedule data in this display.

Figure 9. Counselor Data Page for Students

The display above displays both existing and available counselor data, including details such as number, name, gender, mobile number, address, and email. In this display, the student user can see the available counselor data.

Figure 10. Student User Guidance Schedule Page

Next, the system directs the counselor who doesn't have an account to register as one. The system directs users to input data, including the counselor's name, gender, cellphone number, address, email, password, and reset password. After pressing the register button, the system directs the user to the login display for logging in.

Figure 11. Counselor Registration Page

The following display shows the counselor's user dashboard, which includes a schedule of students who have submitted a counseling guidance schedule. In this display, the counselor user can approve or delete the student's counseling guidance schedule application.

Figure 12. Counselor User Dashboard Page

In this student data display, counselor users can see data on students who have applied for counseling guidance. Counselor users can see student data in this display, such as student number, name, NIS, cellphone number, address, and email.


Figure 13. Student View Page on Counselor

The display below allows the counselor user to view the approved counseling schedule data. This display includes data such as the number, date, type of problem, student name, place, description, and status. In this view, the counselor user has the option to delete the guidance schedule data if they so choose.

Figure 14. Page Counselor Approves Schedule

In this student data report display, student data will be printed via the counselor in accordance with the instructions. Then the counselor will summarize all the student data which will be submitted to the school principal.
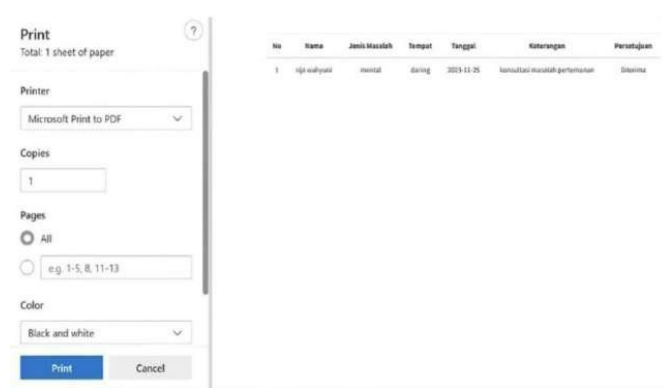
Figure 15. Student Data Report Page

CONCLUSION

We can conclude, based on the results and discussion of the Counseling Guidance Management Information System at SMA ABC in the previous chapter, that this system aids in identifying the unique needs of each student, both academic and non-academic, empowering counselors to tailor their services accordingly. every student. Student data can be better recorded, helping to monitor student progress over time, including academic records, behavior, and emotional development. By automating several administrative projects, the system can increase the efficiency of the guidance and counseling process in schools, allowing counselors to focus more on providing direct services to students.

REFERENCES

[1]   A. Mayasari, Y. Supriani, and O. Arifudin, "Implementasi Sistem Informasi Manajemen Akademik Berbasis Teknologi Informasi dalam Meningkatkan Mutu Pelayanan Pembelajaran di SMK," *JIIP - J. Ilm. Ilmu Pendidik.*, vol. 4, no. 5, pp. 340–345, 2021, doi: 10.54371/jiip.v4i5.277.

[2]   W. Widyawati, Y. Hendra, and N. Khairunnisa, "Sistem Informasi Bimbingan Konseling Di Smkn 1 Ciruas Kabupaten Serang," *J. Ilm. Sains dan Teknol.*, vol. 5, no. 2, pp. 23–37, 2021, doi: 10.47080/saintek.v5i2.1512.

[3]   W. A. W. Setiawan, F. Nabyla, and Fathulloh, "Sistem Informasi Bimbingan Konseling Berbasis Web Menggunakan PHP Dan MYSQL Di SMK Nurul Huda NU Paguyangan," *J. Sist. Inf. dan Teknol. Perad.*, vol. 3, no. 1, pp. 23–30, 2022.

[4]   catharina tri Anni, "need assesment model penyusunan program bimbingan dan konseling bidang bimbingan belajar berbantuan sistem informasi manajemen di SMA negeri kota semarang," *In-patient Child Psychiatry Mod. Pract. Res. Futur.*, vol. 1, no. 1, pp. 143–153, 2013.

[5]   A. Harfiana and B. Said, "Sistem Informasi Manajemen Bimbingan Konseling Berbasis Web Dan Mobile (Studi Kasus SDN Barurambat Kota 1 Pamekasan)," *J. Insa. Comtech*, vol. 4, no. 2, pp. 33–40, 2019, [Online]. Available: http://ejournal.unira.ac.id/index.php/insand_comtech/article/view/680

[6]   M. Sari and M. Muflih, "Sistem Informasi Manajemen Data Beasiswa Bidikmisi Pada Universitas Islam Kalimantan Muhammad Arsyad Al Banjari (Uniska Mab) Banjarmasin," *Al Ulum J. Sains Dan Teknol.*, vol. 2, no. 2, pp. 64–68, 2017, doi: 10.31602/ajst.v2i2.724.

[7]   Damayanti and N. Nirmalasari, "Payroll Management Information System and Performance," *J. Teknol. Inf. dan Ilmu Komput.*, vol. 6, no. 4, pp. 389–396, 2019, doi: 10.25126/jtiik.201961003.

[8]   A. Farida, R. Wahyono, and F. Supanto, "Model Sistem Informasi Manajemen Terpadu Untuk Meningkatkan Mutu Layanan Pendidikan," *J. Adm. dan Manaj. Pendidik.*, vol. 4, no. 1, p. 24, 2021, doi: 10.17977/um027v4i12021p24.

[9]   D. Riswanda and A. T. Priandika, "Analisis Dan Perancangan Sistem Informasi Manajemen Pemesanan Barang Berbasis Online," *J. Inform. dan Rekayasa Perangkat Lunak*, vol. 2, no. 1, pp. 94–101, 2021.

[10]   P. H. Putra and M. S. Novelan, "Perancangan Aplikasi Sistem Informasi Bimbingan Konseling Pada Sekolah Menengah Kejuruan," *J. Teknovasi*, vol. 07, no. 1, pp. 1–7, 2020.

[11]   D. Primasari and D. L. Putri, "Sistem Informasi Bimbingan Konseling Berbasis Android," *Krea-Tif*, vol. 6, no. 1, p. 1, 2019, doi: 10.32832/kreatif.v6i1.2196.

[12]   A. Nuraini and A. A. Rachmawati, "Perancangan User Interface Aplikasi M Parkir Universitas Widyatama Menggunakan Metode Design Thinking," *JUSTINFO | J. Sist. Inf. dan Teknol. Inf.*, vol. 1, no. 1, pp. 21–33, 2023, doi: 10.33197/justinfo.vol1.iss1.2023.1249.

[13]   S. Steven, W. Rifaldi, and U. Nugraha, "Strategi Pengamanan Front-end dalam Pengembangan Website," *JUSTINFO | J. Sist. Inf. dan Teknol. Inf.*, vol. 1, no. 1, pp. 42–53, 2023, doi: 10.33197/justinfo.vol1.iss1.2023.1200.

[14]   F. X. A. P. Jampur and V. Christmantara, "Sistem Informasi Bimbingan Konseling Menggunakan Framework PHP Codeigniter 4.0 (Studi pada SMAK Frateran Malang)," *J. Teknol. dan Manaj. Inform.*, vol. 8, no. 2, pp. 94–107, 2022, doi: 10.26905/jtmi.v8i2.7795.