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USING PROTOTYPING METHODS TO DEVELOP THE INFORMATION SYSTEM FOR ACADEMIC ADVISORS

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ABSTRACT

The development of information technology has caused many changes in various fields, especially for including education. It is related to whether ready or not ready, but online service system should be provided by educational institutions. STMIK Royal as an information technology has prepared the tools to respond to this condition. Likewise, services to all students which we found that would be done by academic advisors. And an academic advisor is a type of counselor who works with students, usually at the college level. However, they are the ones responsible for helping students in the academic process when they follow the subjects every day. Many problems must be consulted with the academic advisor. For this reason, the guardianship information system needs to be developed as a media for a guardian lecturer in carrying out his/her duties as an academic supervisor. Therefore, this system can be used online with the facility and to record every activity, for example: make daily, monthly, and annual reports. The academic advisor of information system was developed by applying the prototyping method in the development stage. The prototyping method is suitable to support the software development. By integrating this information system, it was easier, especially for an academic advisor to monitor the students and also to guided student development.

INTRODUCTION

The development of technology and information in Indonesia is rapidly evolving and access the internet with easy for us and then change can be faster in our life, including the world of education. Ready or not the campus must be provided the online learning system [1]. Many universities are not ready for the situation, so service to stakeholders must be less than optimal. The reputation of higher education now is also determined by the level of use of information technology in providing services to the academic community. If this is not resolved, it will further decrease the quality of

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education and public trust in institutions. The impact is also felt by an academic advisor in guiding students.

Academic advisors are permanent lecturers assigned the task to give consideration, guidance, advice and approval to students for their guidance in determining the courses taken in their study plans, the number of credits to be taken, examinations and thesis / final project [2]. Academic advisors have an important role in helping the smooth running of educational activities at the tertiary level. Academic advisors help universities to keep students performing and able to complete their education on time [3]. For this reason, a tool is needed for academic advisors to facilitate their duties and obligations in order to be able to fulfill their role as guardian lecturers ideally. So that students will reach character [4].

Higher education has an obligation to determine the academic advisors for each student [5]. Each university has its own rules and procedures for determining trustee lecturers. Every college is required to have an academic guidance system [6]. This is a form of attention and effort in maintaining good relations between universities and their students.

Currently, the STMIK Royal campus has an academic guidance system although it is still done manually. The process of determining guardian lecturers for each student at the beginning of the new student semester. To make it easier to monitor students, STMIK Royal provides lecturers to students of the same class. Guardian lecturers in conducting academic guidance are required to make written records of every guidance activity conducted on students to be reported to the study program. The process of guidance and reporting of activities must be done once a month for each semester. The current system is only to control the study plan card, study result card, Performance Index and academic activities through the academic information system. To assist the trustee lecturers in conducting guidance activities such as making reports, there is currently no. This has become one of the obstacles for academic advisors in improving services to students. Academic advisors have the task to help students in their academic activities at STMIK Royal. Monitor activities that must be carried out by students such as to fill the study plan card or (KRS) and card study result (KHS) distribution and monitoring tuition, attendance and others in accordance with the job description. Constraints that are often found by academic advisors are difficult to find, so students do not conduct guidance with lecturers. If there are problems, students tend to go directly to the study program.

METHOD

Research is like a road map for researchers who guide and determine the direction of the ongoing research process correctly and precisely in accordance with the objectives set. Research is a systematic investigation to increase the amount of

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knowledge and investigate specific problems that require answers or problem solving. To get good research results, you need to follow systematic steps that have been set. The research steps to be carried out such as problem analysis, data collection, implementation and results. We can be seen more details in Figure 1:

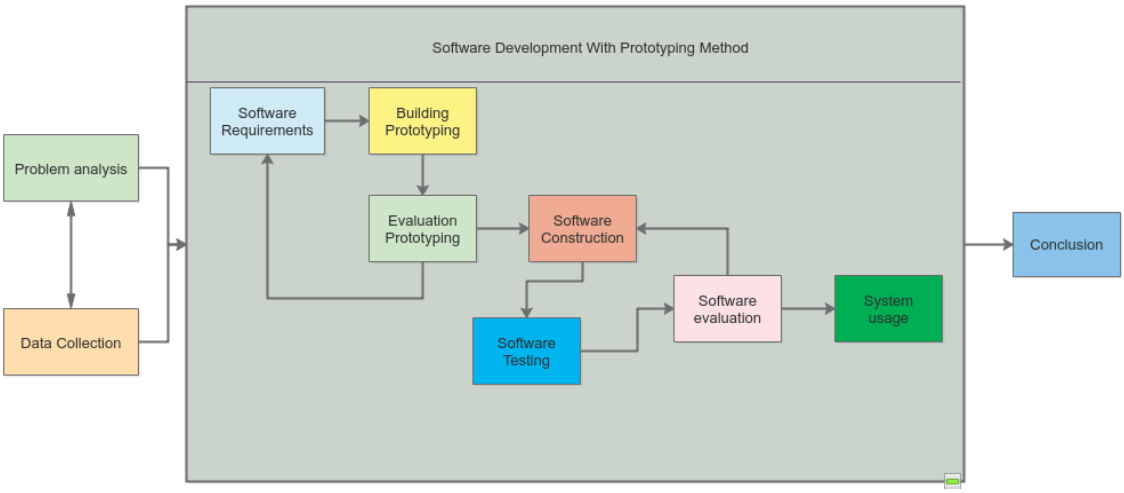

Image 1. Research Method

The stages of the research method in figure 1 are as follows:

1. Problem Analysis: There is no information system that can be used by Academic advisors in assisting the guidance process, especially in recording historical consultations conducted with students. The process of making monthly reports manually
2. Data Collections: Collecting data using literature from journals, SOPs, quality standards, quality manuals and academic guidance as well as seeing reports made by guardian lecturers manually
3. Software Development With Prototyping Method: Software development by following the steps in the prototyping method including Software Requirements, Building Prototyping, Evaluation Prototyping, Software Construction, Software Testing, Software Evaluation, System Usage
4. Conclusion: Take the conclusions from the results of research that has been done.

Prototype is an early version of a system [7]. The Prototyping Method [8] can be used as a software developer and user. The process that will be carried out the development of academic advisor for information systems is as follows:

A. Problem Analysis

Academic advisor system at STMIK Royal has been done with manually, we can seen in the flow as follows:

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Image 2. Academic Advisor Flow

Academic guidance process has been done and seen in the image 3

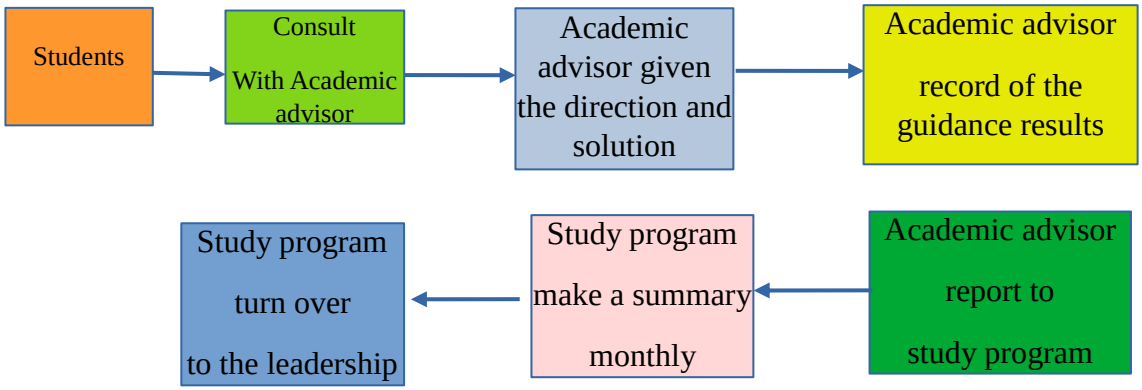

Image 3. Guidance Process of STMIK Royal

The process carried out in image 3. And still done face to face or with manually. So it is necessary to make a academic advisor information system to facilitate the academic guidance process. So the Guardian Lecturer Information System needs to be made to have the main features including managing student data, looking at student academic activities, making monthly reports, looking at problem statements.

B. Software Development With Prototyping Method

The steps that will be taken in developing software with the Prototyping method are as follows:

1. Software Requirement

Analysis of system requirements to determine functional and non-functional requirements [9]. Identification is done to get an overview of all the needs that will be made. This process is assisted by the Unified Modeling Language (UML)

2. Building Prototyping

Making prototypes of the system that will be needed. Make a temporary design that focuses on the presentation that will be given to users. This design can be made in the form of input and output formats. It aims to provide a general description to the system user to be generated

3. Evaluation Prototyping

After presented to the user, then do the evaluation of the prototype that has been created is already in accordance with the request or desire of the user, If was not suitable, we will be changed and doing back this activity for need analysis. If found something the

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error, so will be done to repair it [10]

4. Software Construction

The process of changing the design into a system [11]. Prototype which has been approved by the user after doing some evaluation of the prototype, we would be made the code in using language programming in PHP and database Maria DB Server.

5. Software Testing

The process of construction is completed done, and then to do the system testing by using software testing methods like a black box and FGD (Focus Group Discussion) [12].

6. Software Evaluation

Software has been tested and completed, it will be tested by the user whether it is in accordance with the expected demand.

7. Software Usage

Software that has been evaluated by users and got ready to use it

RESULT AND DISCUSSION

In the implementation can be seen and the architecture will be used as follows

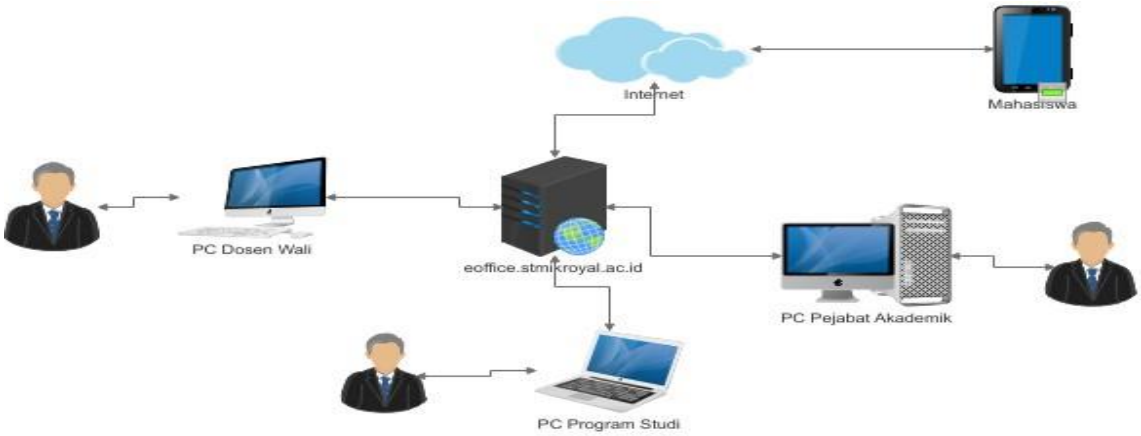

Image 4. Academic advisor Information System Architecture

The main features of the Academic advisor information system can be seen in the usecase diagram section as shown below:

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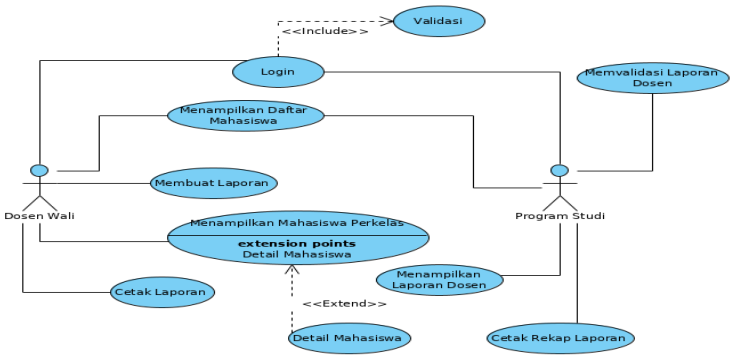

Image 5. Usecase Diagram to describe the system features

In here, there are some of the STMIK Royal academic advisor Information System user interfaces that have been built:

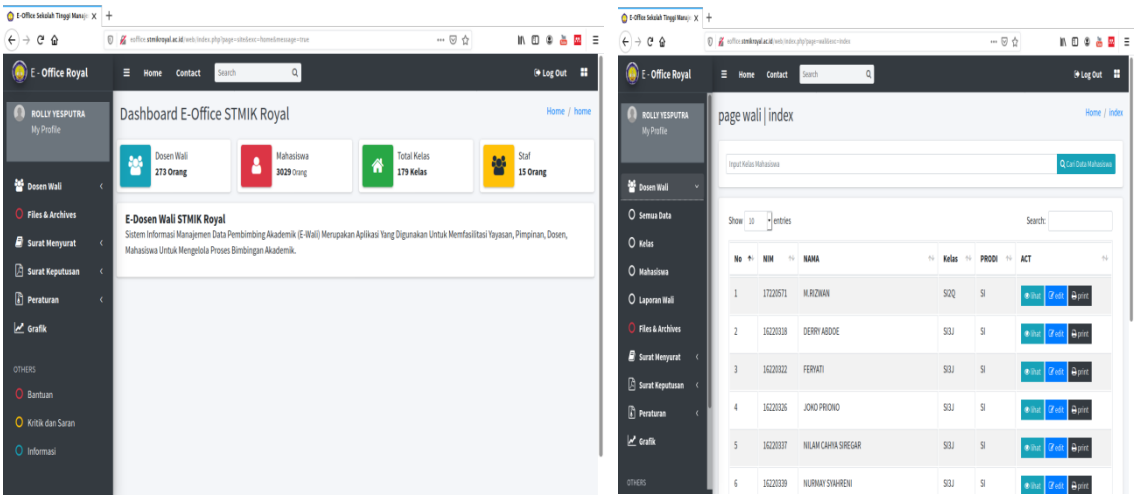

Image 6. Dashboard Page and Class Data

Figure 6 the main page display for academic advisor when entered to the academic advisor information system and saw the data display. Making a report can be seen in the following bellow it:

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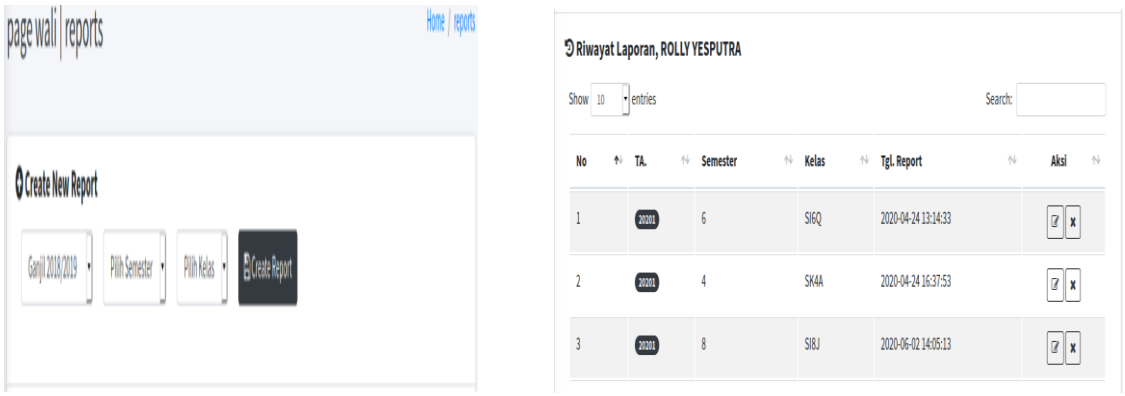

Image 7. Form Create New Report

Making monthly reports, as follows:

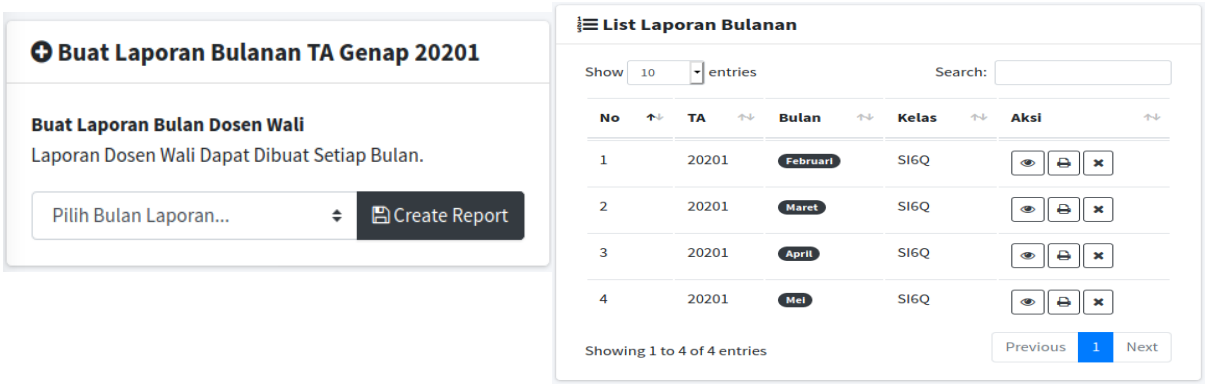

Image 9. Form Create Report Month

Detailed monthly report, as follows:

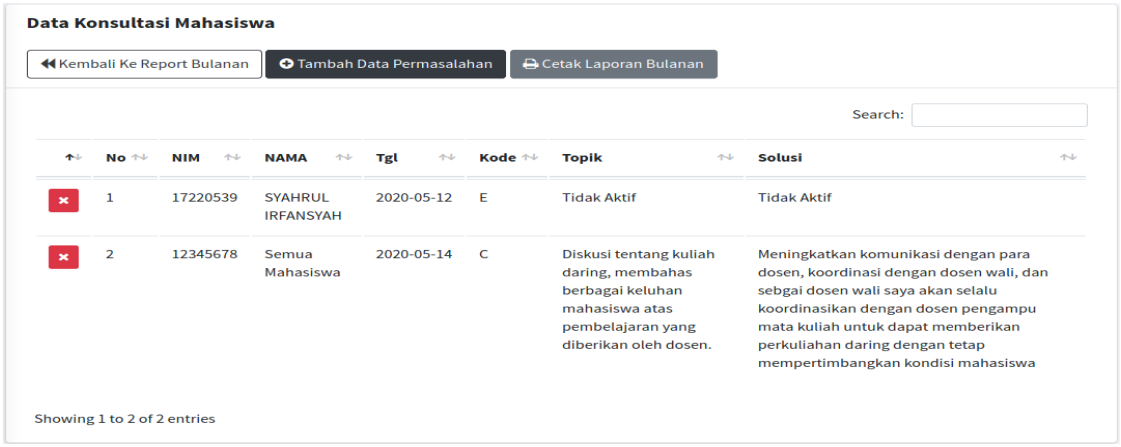

Image 10. Detail Monthly Report,

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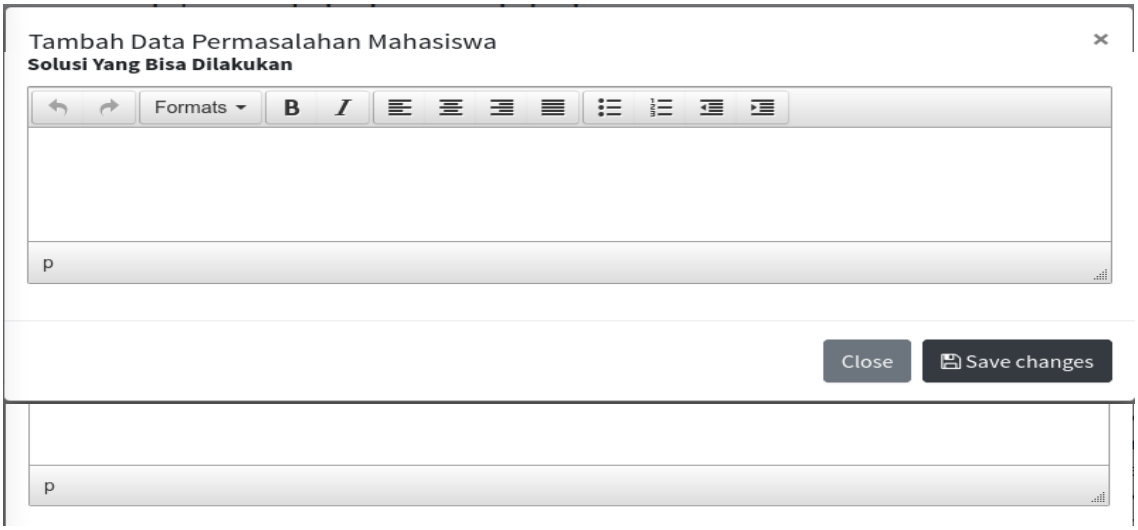

Image 11. Add Notes in Form

SEKOLAH TINGGI MANAJEMEN INFORMATIKA DAN KOMPUTER ROYAL
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PROGRAM STUDI SISTEM INFORMASI
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Website: www.stmikroyal.ac.id | Homepage: s1is.stmikroyal.ac.id | Email: s1is@royal.ac.id

REKAPITULASI BIMBINGAN MAHASISWA SEMESTER GENAP 20201

Semester / Kelas : 6 (Enam) / SI6Q
Bulan Laporan : Mei / 2020
Dosen PA : **ROLLY YESPUTRA, S.Kom, M.Kom.**

No.	NIM	NAMA MAHASISWA	TANGGAL	KODE	TOPIK/PERMASALAHAN	SOLUSI
1	17220539	SYAHRUL IRFANSYAH	2020-05-12	E	Tidak Aktif	Tidak Aktif
2	12345678	Semua Mahasiswa	2020-05-14	C	Diskusi tentang kuliah daring, membahas berbagai keluhan mahasiswa atas pembelajaran yang diberikan oleh dosen.	Meningkatkan komunikasi dengan para dosen, koordinasi dengan dosen wali, dan sebgai dosen wali saya akan selalu koordinasikan dengan dosen pengampu mata kuliah untuk dapat memberikan perkuliahan daring dengan tetap mempertimbangkan kondisi mahasiswa

Rekapitulasi Permasalahan mahasiswa harap dikumpulkan paling lambat tanggal 10 setiap bulannya ke Prodi Masing-Masing

Kode Permasalahan Mahasiswa

- A : Masalah Presensi Mahasiswa
- B : Masalah Nilai Mahasiswa
- C : Masalah Pada Proses Belajar dan Mengajar
- D : Masalah Uang Kuliah
- E : Permasalahan Lainnya

Tertanda Dosen Pembimbing Akademik
Kisaran, 09 June 2020

ROLLY YESPUTRA, S.Kom, M.Kom

Image 12. Output Form of Academic Advisor Report Shows Consultative History Data

The system trial is carried out for one month. Testing this system used the black box method. From the results of tests conducted on existing modules and got 100% valid results. Modules that correspond to the details of this published:

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Table 1. Black Box Testing Results

No	Tested Modules	Test result
1	Dashboard Module	Valid
2	Login Module	Valid
3	Class Module	Valid
4	Report Module	Valid
5	Monthly Report Module	Valid
6	Detailed Report Module	Valid
7	Report Print Module	Valid

System testing with FGD is done by the user with directly and using the system that has been made. From the results of testing the user stated to accept the system and will be developed in the column. So we can be seen, the details are as follows:

Table 2. Details of FGD Testing

No	Component	Rating result
1	User Interface	Accepted overall
2	Responsive	Accepted
3	Multiplatform	Accepted
4	User convenience	Accepted with notes
5	Completeness of Information	Accepted

CONCLUSION

Based on the research results obtained, it can be concluded the academic advisor especially for developing of information system by using the prototyping system floating method. It was successfully carried out. Because by using a prototype method that makes it easy for users. The lecturer information system can be used well to assist lecturers in carrying out their duties and assistance as academic advisers. Using this system the process of guidance, monitoring and making advisor reports can be done easily. This system supports multiplatform and is also developed by using the open source software.. From the results of testing the system states that the user can be accepted in the well-developed system

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BIBLIOGRAPHY

[1] T. Limbong and J. Simarmata, "Menentukan Matakuliah yang Efektif Belajar Daring (Belajar dan Ujian) dengan Metode Multi-Attribute Utility Theory (MAUT)," *J. RESTI*, vol. 4, no. 2, pp. 370–376, 2020.

[2] A. Setiawan, P. Setiaji, and A. P. Utomo, "Sistem Informasi Perwalian pada Program Studi Sistem Informasi Universitas Muria Kudus," *Sains dan Teknol.*, vol. 4, no. 1, pp. 1–18, 2011.

[3] H. A. Setyadi and E. C. Nugroho, "Pengembangan Sistem Bagi Pembimbing Akademik Untuk Memantau Perkembangan Mahasiswa," *Sentra Penelit. Eng. dan Edukasi*, vol. 6, no. 3, pp. 57–65, 2014.

[4] A. Partawibawa, S. Fathudin, A. Widodo, J. Pendidikan, T. Otomotif, and F. T. Uny, "Peran Pembimbing Akademik Terhadap Pembentukan Karakter Mahasiswa," pp. 1–8, 2014.

[5] N. Norhikmah, "Perancangan Sistem Informasi Monitoring Dosen Wali Menggunakan ASP.NET Signal R," *Creat. Inf. Technol. J.*, vol. 3, no. 3, p. 171, 2016.

[6] S. Yanti, N. Afni, and R. S. Samosir, "Analisa dan Perancangan Sistem Pembimbingan Akademik Institut Teknologi dan Bisnis Kalbe," vol. 5, no. 2, 2013.

[7] A. Syarifudin, "Perancangan Sistem Informasi Pengajuan dan Pelaporan Pembayaran Tunjangan Kinerja Kementerian Keuangan Menggunakan Metode Prototype," *J. Sisfokom (Sistem Inf. dan Komputer)*, vol. 8, no. 2, p. 149, 2019.

[8] I. Sammorville, *Software Engineering*, 10th ed. Pearson, 2016.

[9] W. Nugraha and M. Syarif, "Penerapan Metode Prototype Dalam Perancangan Sistem Informasi Penghitungan Volume Dan Cost Penjualan Minuman Berbasis Website," *JUSIM (Jurnal Sist. Inf. Musirawas)*, vol. 3, no. 2, pp. 94–101, 2018.

[10] E. Kurniawan and A. K. Syahputra, "Perancangan Aplikasi Pemesanan Dan Pembayaran Berbasis Desktop Pada Percetakan UD. AZKA GEMILANG Menggunakan Metode Prototype," *Semin. Nas. Raya*, vol. 9986, no. September, pp. 105–110, 2018.

[11] P. Y. Saputra, "Politeknik Negeri Malang Menggunakan Metode Rapid Application Development (Rad)," pp. 1–8, 2014.

[12] R. Ramadi, "Penerapan Knowledge Management System Pada Perusahaan Otomotif : Studi Kasus Pt. Astrido Jaya Mobilindo," *Simetris J. Tek. Mesin, Elektro dan Ilmu Komput.*, vol. 7, no. 2, p. 635, 2016.