International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

Educational Evaluation Information System of STMIK GICI Using the Life Cycle System Development Method

Hariselmi[1], Waskito[2]
[1,2]Vocational Technology Education, Padang State University, Padang, Indonesia

Abstract**—** *This study aims to describe the process of designing educational evaluation information systems at STMIK GICI using the System Development Life Cycle (SDLC) method. The reason for conducting this research is to produce a valid, practical and efficient education evaluation information system. The research methodology used is Research and Development. There are six stages to be carried out: feasibility study, investigation, analysis, design, implementation, review and maintenance. The development of the Education evaluation information system at STMIK GICI is an innovation in the of education evaluation.*

Keywords**—** *Evaluation, University, SDLC, Research and Development, Information Systems.*

I. INTRODUCTION

Higher education is an education unit that organizes educational levels including diploma (D3), undergraduate (S1), master (S2), doctoral (S3) programs and specialist programs organized by higher education institutions (Permenristekdikti No. 44 of 2015 about National Standards for Higher Education). Educational evaluation in tertiary educationas one part of the curriculum, plans, and activities are crucial. Evaluation not only provides information about the level of learning achievement of students, but also provides information about other related components. It can be concluded, through evaluation we can study all components of the curriculum and also can find out the relationship in the curriculum system. The implementation of learning requires educators to make many decisions. Among them are decisions concerning the teaching and learning process, guidance selection, learning outcomes, and so forth.

According to (Ambiyar 2019) Evaluation is an activity to measure something or condition so that it presents an information form of value as an alternative in making decisions. (Ambiyar 2019) also believes that evaluation research is two different things, where research aims to prove something while evaluation is a consideration for making decisions to develop something [1]. Some studies on evaluating information systems include: valuation for the application of accounting information systems[2], evaluation of hospital management information systems [3], evaluation of the quality of the final project information system [4], an interactive book evaluation based on augmented reality [5], evaluation of smart library information systems [6] and there are still many evaluations in the field of other information systems.

Information system is one of the most important things in a college. With the information system, the organization or university can guarantee the quality of the information presented and can make decisions based on that information. As technology develops, the need for fast, precise and accurate information is needed. Therefore, the existence of an information system has become an absolute necessity for universities to run their business processes. The application of information systems has already been applied in various fields such as: student monitoring[7], mapping peatlands [8], Android based school search [9].

Evaluation information system is expected to be able to support and improve performance in tertiary institutions. An integrated evaluation information system is not only built to solve problems, but can also be used to support seizing opportunities through strategies generated from information held by tertiary institutions. In order to produce information that can support decision making in the company, the evaluation information system requires a collection of data used to support decision making. Research on evaluation information systems including for: educators[10] learning evaluation [11], a small industrial center [12].

The method used in this study is the System Development Life Cycle. Research on this method can be applied to scheduling teaching and learning based activities[13], cash flow [14], developing a forensic audio framework [15], sale of goods [16].

The objectives expected in this study are as follows: Generating a web-based education evaluation information system using the System Development Life Cycle (SDLC) method, Producing a valid web-based education evaluation information system in STMIK GICI Batam, Producing a web-based educational evaluation information system that is practical in STMIK GICI Batam, and Generating an effective web-based education evaluation information system at STMIK GICI Batam.

II. RESEARCH METHOD

A. Type of Research

This research is a Research and Development (R&D) or research and development regarding the design of Educational Evaluation Information Systems at STMIK GICI Batam. The development model that will be used in the development of the Education Evaluation Information System at STMIK GICI is System Development Life Cycle (SDLC). The SDLC model

Hariselmi and Waskito, "Educational Evaluation Information System of STMIK GICI Using the Life Cycle System Development Method," *International Research Journal of Advanced Engineering and Science*, Volume 5, Issue 3, pp. 145-150, 2020.

International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

was chosen in this study because the development model has a systematic procedure, in accordance with the problems underlying this research.There are many variants of the stages of SDLC, but are usually divided into the following stages (DE Avison & Fitzgerald, 2006; Hoffer et al., 2011; Kendall & Kendall, 2001; Turban & Volonino, 2012), as in Figure 1 below:

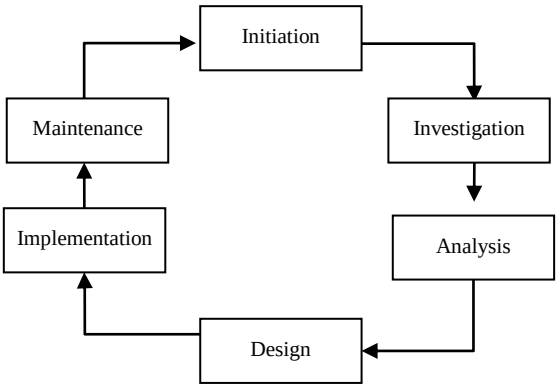

Figure 1. Model Systems Development Life Cycle (SDLC)

B. Development Procedures

In this section the stages / procedures of development will be explained using System Development Life Cycle (SDLC) in accordance with the characteristics of the product to be developed.

1. Initiation

This stage aims to see the need for the development of a new information system that is economically feasible as well as the required criteria. The legal feasibility of this system does not violate the rules and statutes in force at STMIK GICI. Economic feasibility, namely the design of this information system has funding that is expected to be smaller than the benefits to be obtained.

2. Investigation

This stage aims to see the procedure for implementing an educational evaluation by the Internal Quality Assurance Agency (BPMI). The activity undertaken is to look at the planning, implementation and evaluation processes carried out at the end of each semester / period.

3. Analysis

Stages of Analysis carried out with the aim of knowing the needs of the Education evaluation system at STMIK GICI so that the system can be built according to the needs of tertiary institutions. The system requirements specifications in this study are like functional requirements

4. Design

At the design stage is carried out with the aim to determine the information system analysis needs which include: (a) database design and (b) interface design.

5. Implementation

At this stage, the design produced at the information system design stage is realized. Start computer programs written, compiled, and tested. New hardware and software are purchased, installed, installed, and tested. All aspects of the new information system must be tested and in good condition before the system transfer occurs.

6. Maintenance

This last stage runs after the system being built is finished and executed. In day-to-day operations, it is not uncommon to find that the system must be modified or improved to suit the situation.

III. Result and Discussion

At the results and discussion stages will be explained in stages in accordance with the stages of SDLC development to be systematic and easy to understand.

1. Initiation

The expected need for a web-based educational evaluation information system, this is felt to be very necessary because of the current technological developments and the availability of facilities that support to implement the information system.

2. Investigation

Education Evaluation consists of: evaluation of learning, assessment of academic and student services, assessment of facilities, assessment of ICT services. The flow of the educational evaluation process that takes place as Figure 2 below:

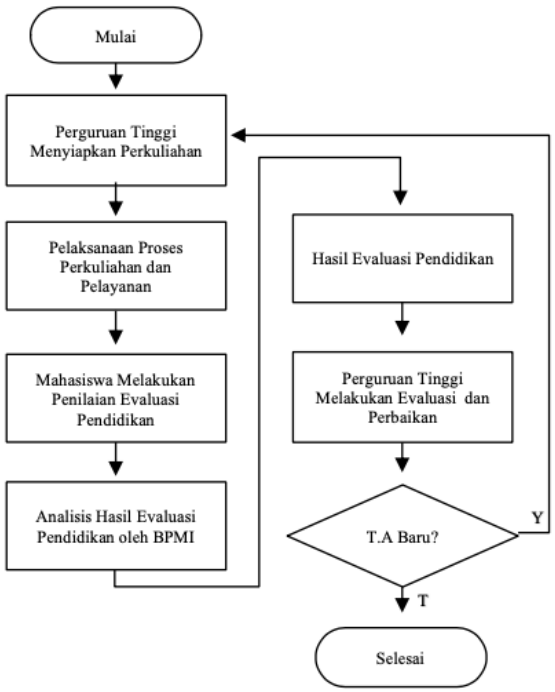

Figure 2. Flowchart of STMIK GICI Academic Evaluation Evaluation Activities

3. Analysis

This stage produces information about functional and non functional requirements analysis such as:

Hariselmi and Waskito, "Educational Evaluation Information System of STMIK GICI Using the Life Cycle System Development Method," *International Research Journal of Advanced Engineering and Science*, Volume 5, Issue 3, pp. 145-150, 2020.

International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

Table 1. System Requirement Specification

No	Information
1	BPMI as the quality assurance body can have the authority to manage educational evaluation data.
2	The information system can run on PC / Laptop / Smartphone devices.
3	The education evaluation information system can be integrated with the university's academic database.
4	Educational evaluation information systems can facilitate students in conducting the assessment process effectively and efficiently.
5	Educational evaluation information systems can produce accurate evaluation reports in the form of graphs and descriptive.
6	Educational evaluation evaluation results can be declared valid, practical and efficient.
7	The education evaluation information system must be in accordance with higher education standards.
8	Educational evaluation information system is easy to use by users.
9	The education evaluation information system guarantees the confidentiality of tertiary data.
10	Educational evaluation information systems can be used on an ongoing basis.

4. Design

This design phase produces system software requirements specifications which include:

a. Database Design

The design of the Education evaluation information system database consists of:

Table 2. Lecturers

#	Name	Type
1	id	int (11)
2	nidn	varchar (11)
3	nama	varchar (45)
4	kelamin	enum ('L','P')
5	tempat_lahir	varchar (45)
6	tanggal_lahir	Date
7	email	varchar (45)
8	no_hp	varchar (45)
9	alamat	Text

Table 3. Users

#	Name	Type
1	id	int (11)
2	group_id	int (11)
3	username	varchar (30)
4	name	varchar (45)
5	email	varchar (45)
6	password	varchar (128)
7	foto	varchar (30)

Table 4. User Group

#	Name	Type
1	id	int (11)
2	group_name	varchar (45)

Table 5. Schedule

#	Name	Type
1	id	int (11)
2	kuesioner_periode_id	int (11)
3	matakuliah_id	int (11)
4	dosen_id	int (11)
5	hari	varchar (11)
6	waktu	varchar (30)
7	program_studi	varchar (30)

Table 6. Questionnaire Selection

#	Name	Type
1	id	int (11)
2	Nama_kuesioner	varchar (45)

Table 7. Questionnaire

#	Name	Type
1	id	int (11)
2	kuesioner_id	int (11)
3	Nomor_urut	int (11)
4	Pertanyaan	int (11)

Table 8. Students

#	Name	Type
1	id	int (11)
2	users _id	int (11)
3	nim	varchar (11)
4	nama	varchar (45)
5	kelamin	enum ('p','l')
6	tempat_lahir	varchar (45)
7	tanggal_lahir	Date
8	email	varchar (45)
9	no_hp	varchar (45)

Table 9. Courses

#	Name	Type
1	id	int (11)
2	kode_mk	varchar (11)
3	nama	varchar (100)
4	sks	char (1)
5	semester	char (1)
6	program_studi	varchar (30)

Table 10. Student Schedule

#	Name	Type
1	id	int (11)
2	jadwal_id	int (11)
3	mahasiswa_id	int (11)

Table 11. Questionnaire Answers

#	Name	Type
1	id	int (11)
2	kuesioner_periode_id	int (11)
3	mahasiswa_id	int (11)
4	kuesioner_id	int (11)
5	jadwal_id	int (11)
6	kuesioner_pertanyaan_id	int (11)
7	jawaban	int (11)

b. Interface Design

Interface design can be used as a reference in building educational evaluation information systems as a prototype of the information system interface that will be implemented. The following are some interface designs created for the Education evaluation system such as the design of the login page, the main page and the questionnaire page.

1) Login Page Design

Hariselmi and Waskito, "Educational Evaluation Information System of STMIK GICI Using the Life Cycle System Development Method," *International Research Journal of Advanced Engineering and Science*, Volume 5, Issue 3, pp. 145-150, 2020.

International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

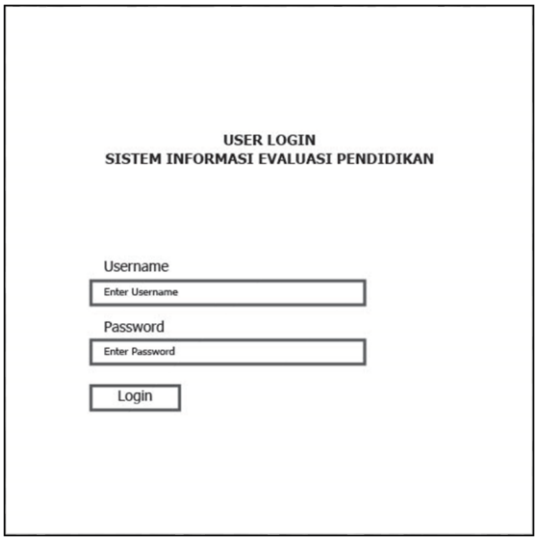

Figure 3. Login Page Design

Interface login is used by the user to access the education evaluation system, Users who access this system are Admin, BPMI and students.

2) Main Page Design

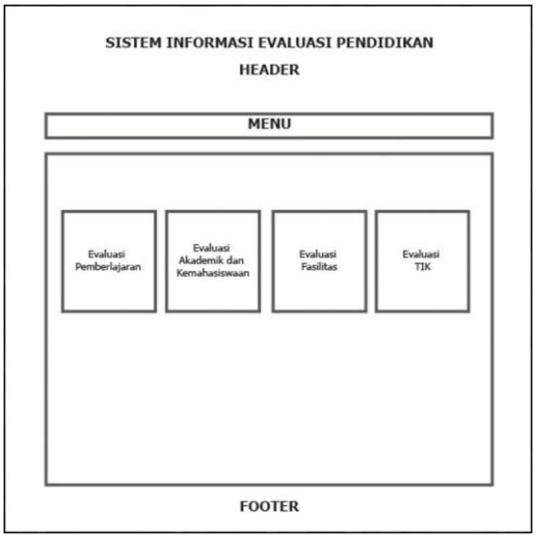

Figure 4. Main Page Design

The main interface design of the education evaluation information system displays the types of evaluations that have been provided by BPMI, which then students as input can conduct Educational evaluation assessments such as evaluations of learning evaluation, academic and student evaluation, evaluation of the availability of facilities and ICT evaluation.

3) Questionnaire Page Design

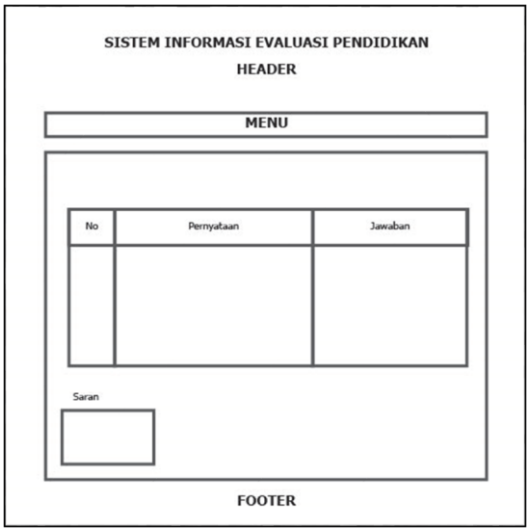

Figure 5. Questionnaire Page Design

The main education evaluation interface is used by students to fill in each item of the education evaluation system statement, the user who accesses the student.

5. Implementation

This stage produces an Education evaluation information system in accordance with the previous analysis and design. The initial appearance of the information system is the login page, this page is used by users to enter the information system according to their respective access rights.

a. Login Page

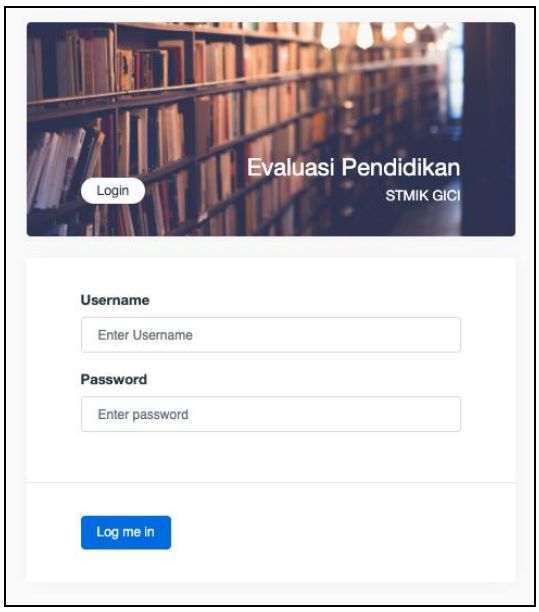

Figure 6. Login page

After successfully logging in, then enter the main page of the Education evaluation information system, the main page immediately shows the choice of the types of educational evalauation that BPMI has prepared for students to access as users who will provide input on evaluation evaluations.

b. Main Page

Hariselmi and Waskito, "Educational Evaluation Information System of STMIK GICI Using the Life Cycle System Development Method," *International Research Journal of Advanced Engineering and Science*, Volume 5, Issue 3, pp. 145-150, 2020.

International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

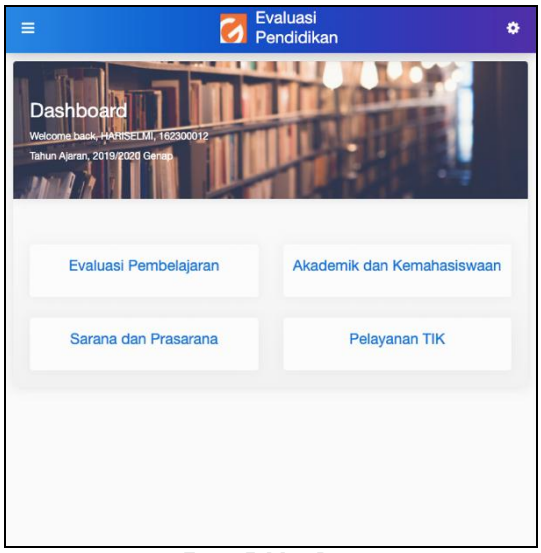

Figure 7. Main Page

The following is a page to fill in one of the evaluation questionnaires available, on this page students will answer every question that arises. Student answer choices use the linkert scale. Instructions for completing the questionnaire are available before the student evaluates this evaluation.

c. Questionnaire Page

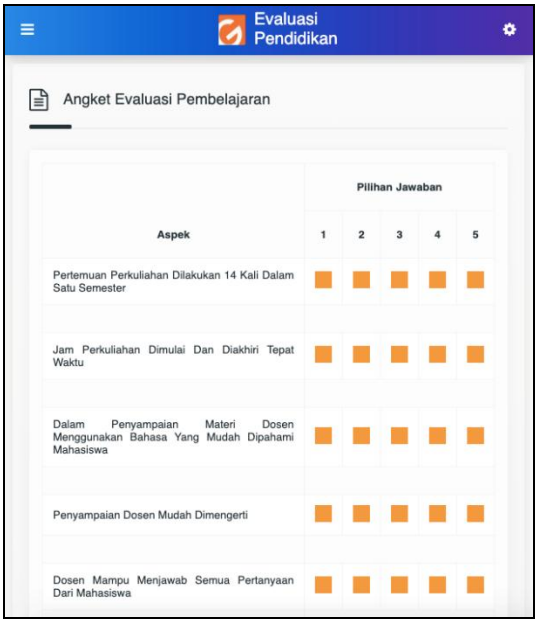

Figure 8. Questionnaire Page

Education evaluation information system results evaluas reports in the form of bar charts, each question is identified with a different color according to the order of each question, the graph is equipped with a value that appears in each bar, this is very easy for BPMI to see the results of evaluations that have been done.

d. Graph Evaluation Result

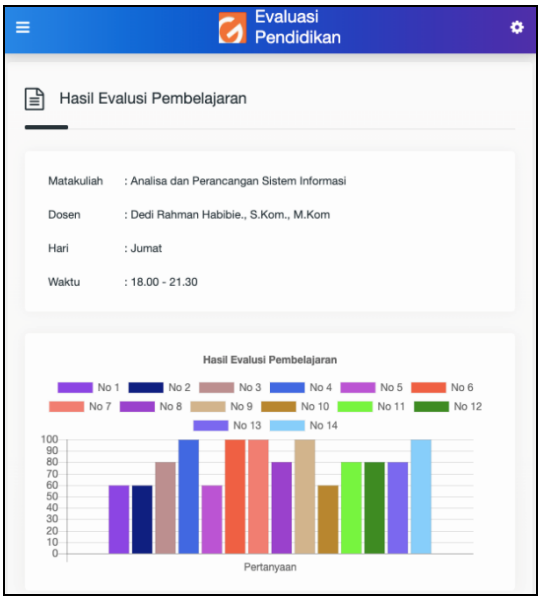

Figure 9. Graph Evaluation Results

To produce information from the results of a more detailed evaluation, the information system is also equipped with evaluation results in the form of descriptive, which consists of questions, the value and the percentage of answers to each question.

e. Descriptive Evaluation Results

Figure 10. Descriptive Evaluation Results

6. Review and Treatment

This stage is the last stage of the STMIK GICI education evaluation information system design, which is evaluating the entire program by knowing the system functionality data is running according to the plan and the system functionality is not working as it should. In carrying out maintenance of education evaluation information systems run continuously as long as this information system is still in use. For further

Hariselmi and Waskito, "Educational Evaluation Information System of STMIK GICI Using the Life Cycle System Development Method," *International Research Journal of Advanced Engineering and Science*, Volume 5, Issue 3, pp. 145-150, 2020.

development, it starts again from the initial stages to form the SDLC cycle.

IV. CONCLUSION

Based on the research product development method used and the research data obtained, it can be concluded as follows: The development of the STMIK GICI Education evaluation information system using the web-based SDLC method is the latest breakthrough in the process of higher education evaluation evaluation which has been carried out paper based. STMIK GICI Education Evaluation consists of evaluation of learning evaluation, assessment of academic and student services, assessment of facilities and assessment of ICT services.

REFERENCES

[1] Ambiyar and Muharika, *Metodologi penelitian evaluasi program*. Bandung, 2019.

[2] M. M. D. Gracia, G. B. Nangoi, and V. Z. Tirayoh, "Evaluasi Penerapan Sistem Informasi Akuntansi Atas Siklus Pendapatan Pada PT. PLN (Persero) Area manado," vol. 4, no. 1, pp. 826–836, 2016.

[3] T. Muryanti, M. Pinilih, and L. D. Oktaviana, "Evaluasi Sistem Informasi Manajemen Rumah Sakit (SIMRS) pada RSIA Bunda Arif Purwokerto Menggunakan Framework COBIT 5," *Probisnis*, vol. 11, no. 1, pp. 59–75, 2018, [Online]. Available: http://ejournal.amikompurwokerto.ac.id/index.php/probisnis/article/view/690/467.

[4] R. Sistem, Y. Fitrisia, and M. Fadhli, "Evaluasi Kualitas Sistem Informasi Proyek Akhir menggunakan Effectiveness dan Satisfaction Quality in Use," *J. RESTI (Rekayasa Sist. dan Teknol. Informasi)*, vol. 3, no. 1, pp. 29–35, 2019.

[5] D. Yulianto, R. Hartanto, and P. I. Santosa, "Evaluasi Buku Interaktif Berbasis Augmented Reality Menggunakan System Usability Scale dan User Experience Questionnaire," *Rekayasa Sist. dan Teknol. Inf.*, vol. 4, no. 3, pp. 482–488, 2020.

[6] D. Dwiyantoro, "Analisis dan Evaluasi Penerapan Sistem Informasi Smart Library AMIKOM Resource Centre dengan Metode Pieces Framework," *Tik Ilmeu J. Ilmu Perpust. dan Inf.*, vol. 3, no. 2, p. 109, 2019, doi: 10.29240/tik.v3i2.962.

[7] H. Utari and Y. S. Triana, "Sistem Informasi Monitoring Siswa Menggunakan SMS Gateway," *J. RESTI (Rekayasa Sist. dan Teknol. Informasi)*, vol. 3, no. 3, pp. 328–335, 2019, doi: 10.29207/resti.v3i3.916.

[8] A. Wijaya, E. P. Agustini, and E. Nardo, "Sistem Informasi Geografis Dalam Pemetaan Lahan Gambut di Kabupaten Musi Banyuasin," *J. RESTI (Rekayasa Sist. dan Teknol. Informasi)*, vol. 2, no. 1, pp. 330–336, 2018, doi: 10.29207/resti.v2i1.298.

[9] T. Gusman, Y. Sonatha, and M. Azmi, "Pengembangan Aplikasi Informasi Pencarian Sekolah Berbasis Android di Kota Padang," *J. RESTI (Rekayasa Sist. dan Teknol. Informasi)*, vol. 2, no. 3, pp. 597–603, 2018, doi: 10.29207/resti.v2i3.553.

[10] S. Rohaeni, F. Renaldi, and A. I. Hadiana, "Pembangunan Sistem Informasi Evaluasi Tenaga Pendidik Dinas Pendidikan Pemuda dan Olahraga Kota Cimahi," *Semin. Nas. Apl. Teknol. Inf.*, pp. 1–6, 2017, [Online]. Available: https://media.neliti.com/media/publications/176347-ID-pembangunan-sistem-informasi-evaluasi-te.pdf.

[11] I. G. D. Prasetia, I. G. M. Darmawiguna, and G. A. Pradnyana, "Pengembangan SIVAJAR : Sistem Informasi Evaluasi Belajar Berbasis Web (Studi Kasus : SMK Negeri 3 Singaraja)," *J. Pendidik. Teknol. dan Kejuru.*, vol. 14, no. 1, 2017, doi: 10.23887/jptk.v14i1.9881.

[12] R. Wahyuniardi, L. H. Afrianti, S. Nurjaman, and W. Gusdya, "Sistem Informasi Berbasis Web Untuk Monitoring Dan Evaluasi Sentra Industri Kecil Di Jawa Barat," *J. Ilm. Tek. Ind.*, vol. 14, no. 2, pp. 174–186, 2016.

[13] R. Hermawan, A. Hidayat, and V. G. Utomo, "Sistem Informasi Penjadwalan Kegiatan Belajar Mengajar Berbasis Web (Studi Kasus : Yayasan Ganesha Operation Semarang)," *Indones. J. Softw. Eng. Audit*, vol. 2, no. 1, pp. 31–38, 2016.

[14] S. B. Hartono, "Pengembangan Sistem Informasi Arus Kas Dengan Metode Sdlc (System Development Life Cycle) Pada Madin Al-Junnah," *ISOQUANT J. Ekon. Manaj. dan Akunt.*, vol. 4, no. 1, p. 1, 2020, doi: 10.24269/iso.v4i1.337.

[15] R. Inggi, B. Sugiantoro, and Y. Prayudi, "Penerapan System Development Life Cycle (Sdlc) Dalam Mengembangkan Framework Audio Forensik," *SemanTIK*, vol. 4, no. 2, pp. 193–200, 2018, doi: 10.5281/zenodo.2528444.

[16] T. Purwanto, "Rancang Bangun Aplikasi Penjualan Pada Toko Versus," vol. 14, no. 2, pp. 186–193, 2018.