



Application of the Forward Chaining Method to Evaluate Lecturer Performance in Learning at the Kuantan Singingi Islamic University

¹Helpi Nopriandi, ²Nofri Wandu Al-Hafiz

^{1,2}Technical Information, Technic, Kuantan Singingi Islamic University,
Jl. Gatot Subroto KM. 7 Kebun Nenas, Teluk Kuantan, 29562, Indonesia

E-mail: helpinopriandi83@gmail.com¹, Wandie.88one@gmail.com²

ARTICLE INFO

Article history:

Received: 12/07/2020

Revised: 22/08/2020

Accepted: 30/09/2020

Keywords:

System, Information, Forward Chaining, Method, Learning.

ABSTRACT

Kuantan Singingi Islamic University Is a combination of three high schools in Kuantan Singingi Regency, Riau Province, has 4 Faculties with 13 Study Programs and 97 permanent lecturers and 3 non-permanent lecturers, whose main tasks are: transforming, developing, and disseminating science, technology, and arts through education, research, and community service. Application of the Forward Chaining Method in which the inferencing engine uses user-defined information to move to AND and OR logic until an object is determined. All rules must be met so that one object will be achieved. This method is used for the process of evaluating the performance of lecturers in learning at the Kuantan Singingi Islamic University. This system will later be created using the web-based programming languages PHP and MySQL and converted into android which will be used by students in assessing lecturers who have carried out learning each semester. This system also makes it easier for LPMP to make decisions about the learning process that has been carried out by the lecturers.

Copyright © 2020 Jurnal Mantik.

All rights reserved.

1. Introduction

Kuantan Singingi Islamic University is a combination of three high schools in Kuantan Singingi Regency, Riau Province. The three high schools are under the auspices of two foundations. The Kuantan Singingi Higher Education Foundation manages the Swarnadwipa Superior College of Agricultural Sciences (STIP-US) and the Swarnadwipa High School of Technology (STT-US) with notarial deed "Tito Utoyo, SH, June 30, 2000, number 92 and successfully obtained permission on the 5th July 2001, with No. Permit: 66 / D / O / 2001. Meanwhile, the Kuantan Singingi Islamic Higher Education Foundation oversees the Islamic College of Religion (STAI) with the Notary Deed of Tajib Raharjo SH, dated 24 May 2002 Number 152 and operational permit on behalf of the Indonesian Minister of Religion, Coordinator of the Islamic Higher Education (Kopertais) Region XII Riau-Kepri, dated 21 September 2002 number: 12 / XII / K / 2002. Kuantan Singingi Islamic University currently has 4 Faculties with 13 Study Programs and 97 permanent lecturers and 3 non-permanent lecturers [1].

Lecturers are professional educators and scientists with the main task of transforming, developing and disseminating science, technology, and arts through education, research, and community service [2]. The quality of lecturers plays an important role in a university that wants to achieve the goals of the teaching and learning process, namely to produce quality graduates, so it is necessary to increase the quality of education, given the important role of lecturers and also increase human resources in institutions [3]. Professional educators must educate the nation's life so that their presence in a university must be able to motivate themselves and develop themselves in order to increase their work optimally. One of the inputs that lecturers can get to motivate and develop themselves is to assess the teaching and learning process of themselves. Students carry out an assessment of the lecturer with an internal quality assurance body as the facilitator. Information systems have been widely applied to make processes more efficient and effective in both industry and government institutions [4] - [7].

The Forward Chaining method in which the inferencing engine uses user-defined information to move to AND and OR logic until an object is determined. All rules must be fulfilled so that one object will be achieved [8]. This method is used to evaluate the performance of lecturers in the implementation of learning at the Kuantan Singingi Islamic University. This system will later be created using the web-based programming languages PHP and MySQL and converted into android which will be used by students in assessing the performance of lecturers who have carried out learning each semester. Previously, the lecturer



performance evaluation process was carried out by giving assessment questionnaires to students after the implementation of the UAS was carried out, after which the results of the assessment were submitted to the LPMP so that the process of assessing lecturer performance data was less effective and efficient, therefore a system was designed by applying a Forward Chaining method to make it easier. LPMP in processing lecturer performance appraisal data and decision making as a learning evaluation

2. Method

The following are the stages of the research which the author describes in the following flow chart.

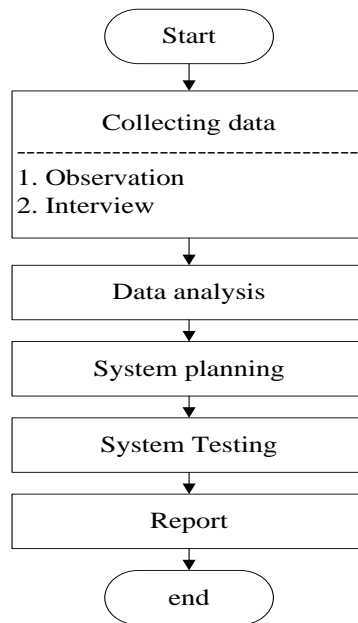


Fig 1. Research Flowchart

a) Collecting Data

At this stage, it is carried out in order to obtain information and data that will be used as a reference in research by using several methods, namely: Observation and Interviews. Observations were made for more accurate data collection by observing and collecting data directly in the LPMP section of the Kuantan Singingi Islamic University, while the interview method was carried out to related parties to explore the information needed in evaluating lecturer performance during learning each semester.

b) Data Analysis

This stage is a very important stage in system design, data analysis is needed as a reference in system design consisting of determining the rules to be used, the data obtained is then analyzed and several rules are formed which will then be applied in coding on the system to be designed.

c) System Design

From the analysis obtained and the formation of several rules with the forward chaining method, the next step is to design a system to evaluate the performance of lecturers in learning in the Kuantan Singi Islamic University environment.

d) System Testing

This step is used to test the system that has been designed so that it knows the weaknesses or deficiencies in the system. Testing must be done before it can be implemented to the user.

e) Reports

The last stage or the completion stage is the preparation of a research report which will later be reported to the LPPM and will be used as reference material in the Kuantan Singingi Islamic University Library.



3. Result and Discussion

3.1 Knowledge Base Analysis

The knowledge base is a collection of facts obtained in this study. The data in the knowledge base comes from LPMP of the Islamic University of Kuantan Singingi, books, journals about the application of the Forward Chaining method. The knowledge base approach used in this study is rule-based reasoning because in this case there are steps for achieving a solution. In this case a user (student) can assess the performance of a lecturer after the implementation of the Final Semester Examination is carried out, the forward chaining method will match the components of the assessment carried out by a student according to the predetermined rules. From the analysis carried out, the author can describe the components of the assessment which the authors can describe as follows:

TABLE 1
COMPONENTS OF ASSESSMENT

Code	Assessment Components
P1	Pedagogic competence
P2	Professional Competence
P3	Personality Competencies
P4	Social Competence

The table above contains 4 assessment components. Then, of the 4 components of the assessment, the authors can describe it in the table below.

TABLE 2
ASSESSMENT

Code	Assessment
G1	Did the Lecturer make a learning plan per semester?
G2	Packaging Learning
G3	Is the lecturer when giving lectures can explain the course material well?
G4	Assessment of Student Learning Outcomes?
G5	The structure of the material being taught?
G6	Mastery in the field of science it teaches?
G7	Is the way the lecturer teaches can increase student interest in learning?
G8	The material taught and its references?
G9	Arif in making decisions?
G10	Providing exemplary behavior and behavior?
G11	Self-control in various situations and conditions?
G12	Choose love in treating students?
G13	Ability to communicate in oral and written?
G14	Attitude in accepting criticism and suggestions, and opinions from students?
G15	Interaction with Students?
G16	Choose love in treating students?
G17	Tolerant of student diversity?

The following is a file that will be used in the assessment of lecturer performance at the Kuantan Singingi Islamic University.

TABLE 3
RULE OF PERFORMANCE ASSESSMENT OF LECTURERS

If	Then
G1, G2, G3, G4	P1
G5, G6, G7, G8	P2
G9, G10, G11, G12	P3
G13, G14, G15, G16, G17	P4

From the table above, there are 4 rules with existing judgments. Based on the above rule, a decision tree can be described for evaluating the performance of lecturers at the Kuantan Singingi Islamic University.

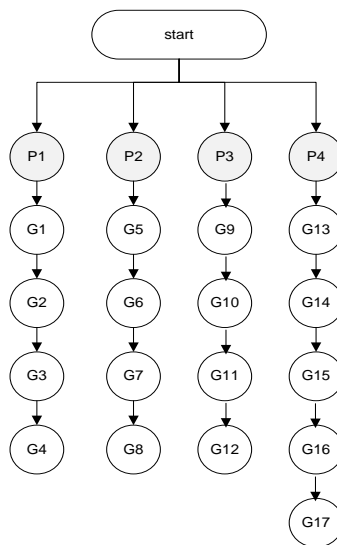


Fig 2. Decision Tree

The following is a knowledge base table of the results obtained on the lecturer performance appraisal by applying the Forward Chaining method.

TABLE 4
RESEARCH RESULT

Code	Assessment	Result
S1	Pedagogic competence	Pedagogic competence performed completely and very well
S2	Professional Competence	Professional competence performed completely and very well
S3	Personality Competencies	Personality competence performed completely and very well
S4	Social Competence	Social Competence which is carried out completely and very well

3.2 Global Design

This global system design is carried out as a preparation for building or designing a system in detail with the widest alternatives of a design. The system design that is carried out in this global design stage consists of the design of Use Case Diagrams, Sequence Diagrams, Activity Diagrams and Class Diagrams. The goals to be achieved at this stage are that the system design must be able to prepare a detailed, useful, easy and efficient design.

A. Usecase Diagram

The following is a use case diagram of a lecturer performance assessment at the Kuantan Singingi Islamic University using the forward chaining method:

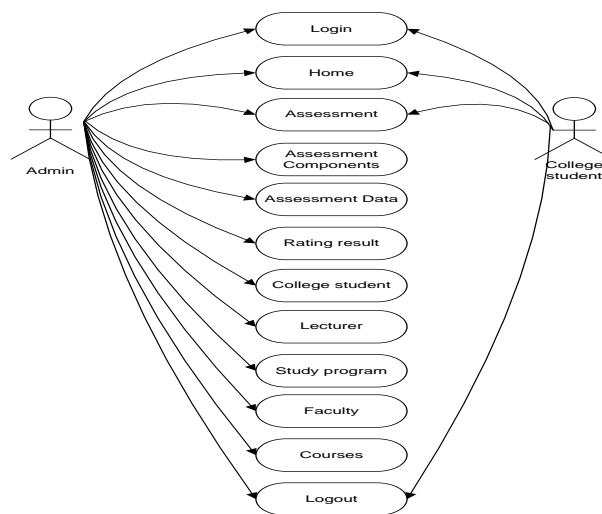


Fig 3. Usecase Diagram



B. Activity Diagram

The following is an overview of the activity diagram in this study.

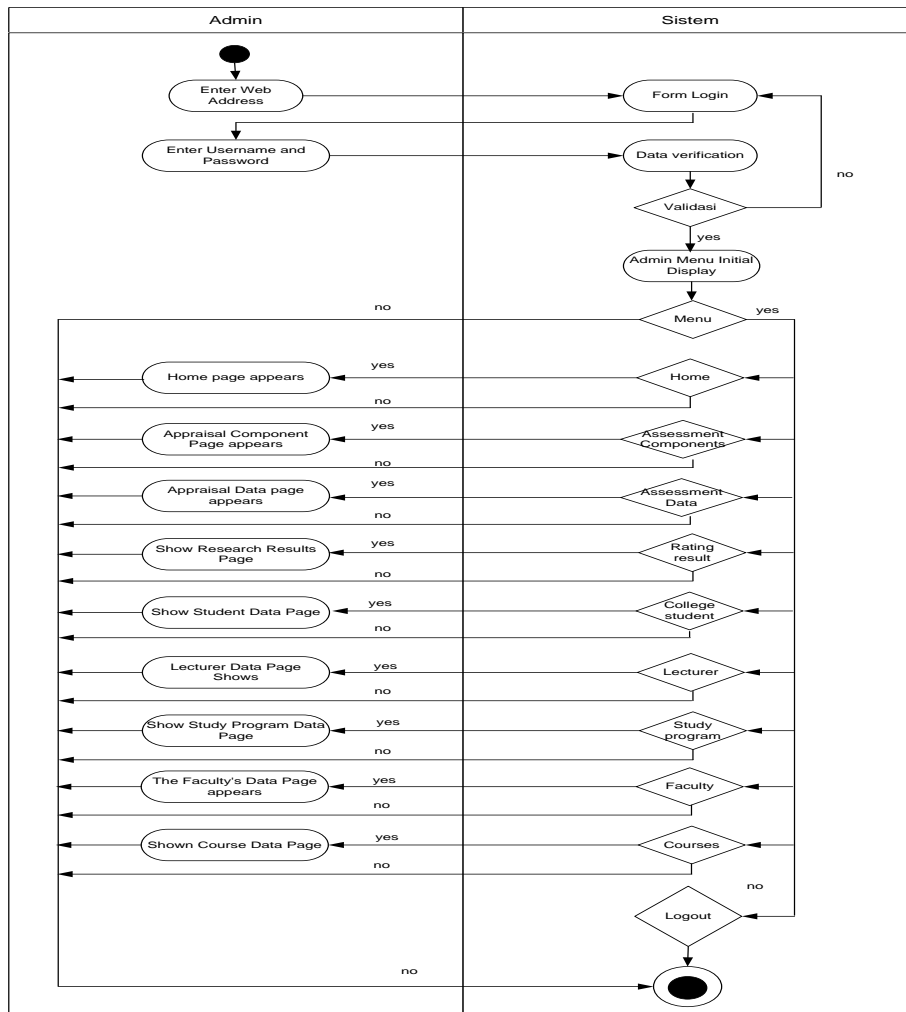


Fig 4. Admin Activity Diagram

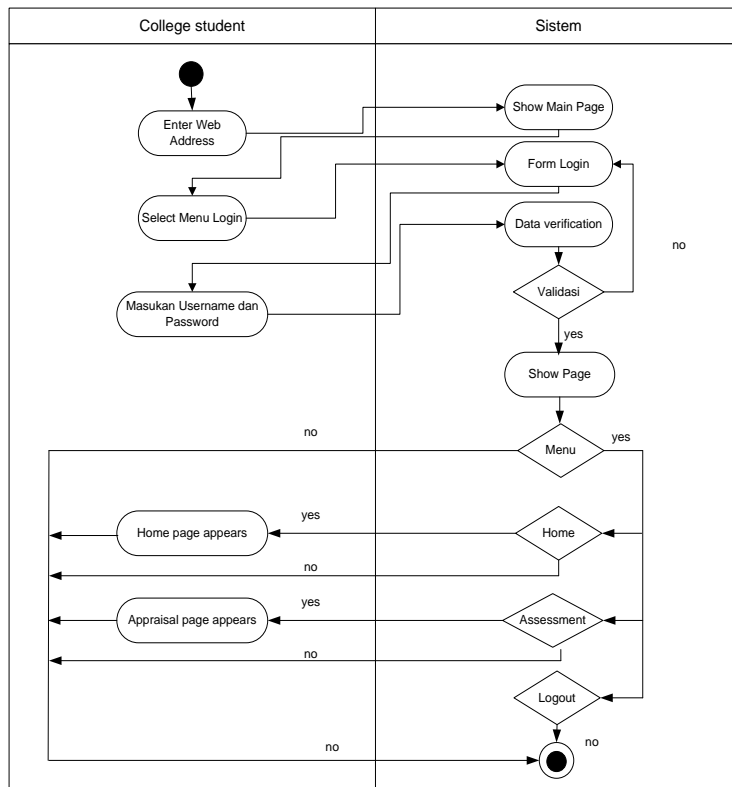


Fig 5. Student Activity Diagram

C. Sequence Diagram

The following is an overview of the sequence diagrams of students conducting lecturer performance assessments at the Kuantan Singingi Islamic University.

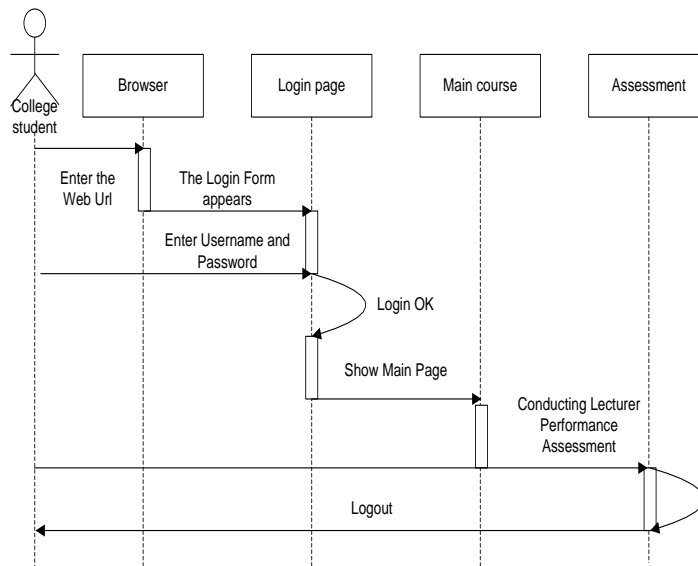


Fig 6. Sequence Diagram of Students Conducting Research

D. Class Diagram

The class diagram in this study is as follows:

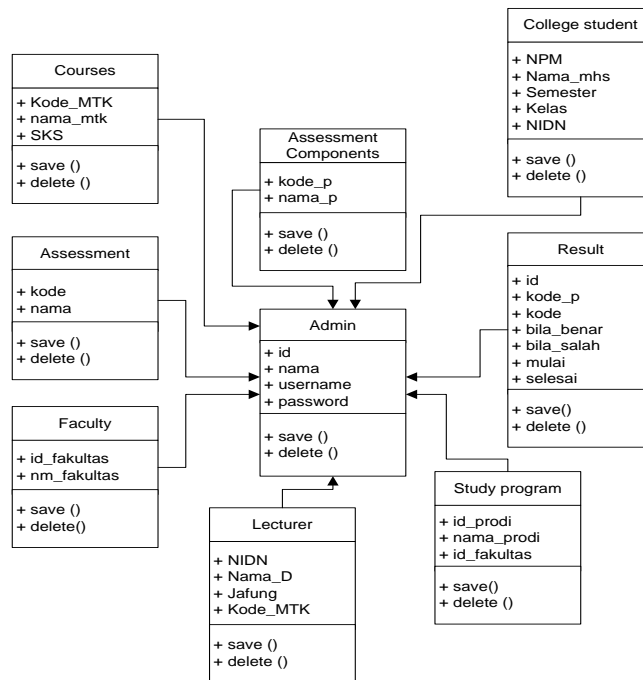


Fig 7. Class Diagram

3.3 Display Interface

The following is the interface display of the lecturer performance appraisal system at the Kuantan Singingi Islamic University.

FORM DATA PENILIAN

Kode :

Penilaian :

SAVE

DATA PENILIAN

No	Kode	Penilaian	Aksi
1	G1	Apakah Dosen membuat perangkat berupa rencana pembelajaran Per Semester?	Hapus
2	G10	Memberikan keteladanan dalam bersikap dan berperilaku?	Hapus
3	G11	Pengendalian diri dalam berbagai situasi dan kondisi?	Hapus
4	G12	Pilih kasih dalam memperlakukan mahasiswa?	Hapus
5	G13	Kemampuan dalam berkomunikasi dalam lisan dan tulisan?	Hapus
6	G14	Sikap dalam menerima kritik dan saran, dan pendapat dari mahasiswa?	Hapus
7	G15	Interaksi dengan Mahasiswa?	Hapus
8	G16	Pilih kasih dalam memperlakukan mahasiswa?	Hapus
9	G17	Toleran terhadap keberagaman mahasiswa ?	Hapus
10	G2	Pengemasan Pembelajaran	Hapus
11	G3	Apakah Dosen pada saat memberi kuliah dapat menjelaskan materi kuliah secara baik?	Hapus
12	G4	Penilaian hasil Belajar Mahasiswa?	Hapus
13	G5	Struktur materi yang diajarkan?	Hapus
14	G6	Penguasaan bidang ilmu yang diajarkannya?	Hapus
15	G7	Apakah cara dosen mengajar dapat meningkatkan minat belajar mahasiswa?	Hapus
16	G8	Materi yang diajarkan dan referensinya?	Hapus
17	G9	Arif dalam mengambil keputusan?	Hapus

Fig 8. Assessment Data

No	Kode	Komponen Penilaian	Aksi
1	P1	Kompetensi pedagogik	Hapus
2	P2	Kompetensi Profesional	Hapus
3	P3	Kompetensi Kepribadian	Hapus
4	P4	Kompetensi Sosial	Hapus

Fig 9. Assessment Component Data

Pertanyaan :

Apakah Dosen membuat perangkat berupa rencana pembelajaran Per Semester?

Pilih Jawaban : Ya Tidak

SAVE

Fig 10. Lecturer Performance Assessment

No	Kode	Detail	Aksi
18	S1	pedagogik yang dilakukan lengkap dan sangat baik	Hapus
19	S2	Kompetensi Profesional yang dilakukan lengkap dan sangat baik	Hapus
20	S3	Kompetensi kepribadian yang dilakukan lengkap dan sangat baik	Hapus
21	S4	Kompetensi Sosial yang dilakukan lengkap dan sangat baik	Hapus

Hasil Dari Penilaian :

Kompetensi pedagogik yang dilakukan lengkap dan sangat baik

SAVE

Fig 11. Rating result

4. Conclusion

With this lecturer performance assessment system, it can make it easier for the Kuantan Singingi Islamic University Education Quality Assurance Institute to evaluate the performance of lecturers in the learning process each semester. The assessments carried out by students in each semester are more efficient and can save expenses from the LPMP itself

5. References

- [1] Sejarah UNIKS. Diperoleh 16 Juli 2019, dari [https://uniks.ac.id/pages/54/Sejarah UNIKS.html](https://uniks.ac.id/pages/54/Sejarah%20UNIKS.html).
- [2] Undang-undang Republik Indonesia No 14 Tahun 2005 tentang Guru dan Dosen.
- [3] Lubna, "Akurasi Dan Akuntabilitas Penilaian Kinerja Guru Pendidikan Agama Islam", *Jurnal Studi Keislaman*, vol. 18, no. 1, 2014.
- [4] F. Tufik, P. Prima, and E. Yudhi, "Perancangan Aplikasi Sistem Kinerja karyawan dengan metode MBO dan BARS", *Jurnal Optimasi Sistem Industri*, vol. 13, no. 2, 2104.
- [5] E. Nurmantio, "Perancangan penilaian karyawan berdasarkan kompetensi spencer dengan metode analytical hierarchy process", *Jurnal Teknik Industri*, vol 8, no. 1, 2006.
- [6] Y. W. Triaji, R. Kridalukmana, and E. D. Widiyanto, "Pembuatan Sistem Informasi Manajemen Klinik dengan Rekam Medis", *Jurnal Teknologi dan Sistem Komputer*, vol.5, no. 1, 2017. doi: <http://dx.doi.org/10.14710/jtsiskom.5.1.2017.15-22>.
- [7] A. Wijayati, "Evaluasi dan Pengembangan Sistem Penilaian Kinerja Pada PT HKS", *Jurnal Psikologi Undip*, vol. 11, no. 2, 2012.
- [8] A. M. R. Tanshidiq, A. D. Hartanto, and D. Prabowo. penerapan metode forward chaining pada aplikasi sistem pakar diagnosa Penyakit Pada Tanaman Bunga Kamboja (ADENIUM). *Jurnal Ilmiah DASI* Vol. 18 No.2. Hlm 60-66.
- [9] Yasmiyati. 2017. Sistem Pakar Diagnosis Penyakit Pada Perokok Dengan Metode Forward Chaining Berbasis Web. Skripsi Program Studi Informatika, Fakultas Komunikasi Dan Informatika, Universitas Muhammadiyah Surakarta.
- [10] A. H. Aji, M. T. Furqon, and A. W. Widodo. Sistem Pakar Diagnosa Penyakit Ibu Hamil Menggunakan Metode Certainty Factor (CF). *Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer*. Vol. 2, No. 5, Mei 2018, hlm. 2127-2134.
- [11] W. Supartini, and Hindarto. Sistem Pakar Berbasis Web Dengan Metode Forward Chaining Dalam Mendiagnosis Dini Penyakit Tuberkulosis di Jawa Timur. *KINETIK*, Vol.1, No.3, 2016, November Hal. 147-154.
- [12] Setiawan Widiyanto. Diperoleh 16 Juli 2019, dari http://eprints.undip.ac.id/56100/3/30000414410019_-_Setiawan_Widiyanto_-_2_BAB_2.pdf.