JSI : Jurnal Sistem Informasi *(E-Journal), VOL. 16, NO. 1, April* 2024
ISSN Print : 2085-1588
ISSN Online :2355-4614
LINK: https://jsi.ejournal.unsri.ac.id/index.php/jsi/index

Outcome-Based Information System for Assessing Graduate Profiles

Fransiskus Xaverius Agung Perkasa Jampur[1], Dionysius J. D. H. Santjojo [2]
[1] Fakultas Teknik/Prodi Sistem Informasi, Unika Widya Karya Malang,
[2] Departemen Fisika, Universitas Brawijaya
e-mail: agungprakasa@widyakarya.ac.id, dsantjojo@ub.ac.id

Abstrak

Pada penelitian ini masalah utama yang ingin diselesaikan penulis yaitu bagaimana menilai kecocokan profil lulusan pada desain kurikulum suatu program studi dengan hasil capaian akhir mahasiswanya. Penulis merancang dan membangun sebuah sistem informasi berbasis luaran menggunakan framework php codeigniter dengan fokus utama untuk melihat kecocokan hasil studi yang telah dilalui mahasiswa selama masa studinya terhadap beberapa pilihan profil lulusan yang didesain pada kurikulum suatu program studi. Tahapan prosesnya yakni dengan memasukan data kurikulum seperti kompetensi yang ingin dicapai setelah mahasiswa menjalani pengalaman belajar, menentukan prosentase Program Learning Outcome terhadap capaian matakuliah atau Content Learning Outcome, selanjutnya dilakukan penilaian dan diperoleh hasil akhir. Lalu selanjutnya data ini akan diproses oleh sistem informasi dan disajikan dalam informasi lengkap tentang hasil capaian mahasiswa dengan menunjukkan tingkat kesesuaiannya dengan profil lulusan. Hasil dari penelitian ini berupa sebuah sistem informasi yang mampu menampilkan informasi kecocokan profil lulusan dengan capaian hasil studi mulai dari capaian matakuliah hingga capaian akhir lengkap beserta analisa hasil luaran studinya secara komprehensif.

Kata kunci: *Sistem Informasi, Outcome Base Education (OBE), Codeigniter*

Abstract

In this research, the main problem that the author wants to solve is how to assess the compatibility of graduate profiles in the curriculum design of a study program with the students' final results. The author designs and builds an output-based information system using the PHP Codeigniter framework with the main focus on seeing the suitability of the results of studies that students have passed during their studies with several choices of graduate profiles designed in the curriculum of a study program. The stages of the process are by entering curriculum data such as the competencies to be achieved after students have undergone a learning experience, determining the percentage of the Learning Outcome Program against course achievements or Content Learning Outcomes, then conducting an assessment and obtaining the final results. Then later this data will be processed by the information system and presented in complete information about student achievement by showing the level of suitability with the graduate profile. The results of this study are in the form of an information system that can display information on the compatibility of graduate profiles with study results ranging from course achievements to complete final achievements along with a comprehensive analysis of the study outcomes..

Keywords*: information system, Outcome Base Education (OBE), codeigniter*

1. INTRODUCTION

In 2020 the Indonesian government is going through a breakthrough proclaimed by the Ministry of Education in the form of the Freedom to Learn policy which changes the learning paradigm to outcome-based education, In other words, a paradigm shift from what teachers think is important to teach students to what is important to learn and master by students [1], [2] Independent self-study adopts the outcome-based education (OBE) learning method, which was introduced in 1994 by teacher and sociologist William G. Spady where the focus of learning is on what important things can be done for all students

successfully at the end of their learning experience[3]. This paradigm shift should also be accompanied by curriculum design, lecturer teaching methods, and assessment of learning outcomes that have adopted the OBE concept[2], [4], [5]

In the results of research on the previous OBE system conducted by Al Aminuddin in 2021, it resulted in an information system design with curriculum components that have adopted OBE starting from determining graduate profiles, and graduate learning achievements, to semester learning plans for courses. Still, it cannot be seen how student learning outcomes are achieved. have had a learning experience [6] . Then in the results of further research in 2022 by Berlian Kushari, the results are obtained in the form of an information system that can facilitate the assessment of OBE-based learning outcomes [7]. However, none of these studies have presented how the results of student learning experiences have been on predetermined graduate profiles, mapping courses based on graduate profiles is important because it can immediately see student potential from the start to be able to determine which profile suits them better.

In 2021 the implementation of an OBE-based curriculum will begin at Widya Karya Catholic University in Malang, The Information Systems study program will begin to implement a change in the OBE paradigm in its curriculum design. In its implementation, the study program needs to measure the accuracy of student study results obtained after taking all courses designed in the curriculum with graduate profiles. From the observations, it was found that lecturers as study guardians had difficulty observing the development of course learning outcomes on graduate profiles as an output reference to aim for, besides that The head of the curriculum section in the curriculum evaluation stage needed to know whether the CLO content in the course was by the intended competence and was sustainable with graduate profiles from student achievements. The first step in implementing OBE in the curriculum is to map the CLO into the PLO and plan how to evaluate it to measure the performance of the CLO [8] .

Outcome-based curriculum design (OBE) is the main focus of this research, where the Study Program first determines the Education Outcome Program (PEO) after which the graduate profiles are the chosen outcomes of student studies which are then translated into several Learning Outcome Programs (PLO), the author wants to know how the learning outcomes during the study period against the predetermined graduate profile.

2. RESEARCH METHOD

In obtaining primary data, the author made direct observations, namely in the implementation of lectures with an OBE-based curriculum at the Information Systems Study Program, Widya Karya Catholic University, Malang. The method used in the development of information systems is a prototyping model in which system information is collected quickly which focuses on how to appropriately present data to system users, as well as system analysis that can be adjusted to system requirements [9]. The author's data comes from curriculum documents such as study program learning achievements, graduate profiles, course data, and student learning outcomes in the form of study grades. with the prototyping model, the system development method flow is obtained as follows:

1. Collection of information system requirements
   It is the initial stage in the form of collecting data on system requirements, namely input data in the form of curriculum, program learning outcomes, content learning outcomes, graduate profiles, and grades. Followed by data processing by giving continuous weights and percentages between data, and finally the system output in the form of presenting student achievement data.
2. System modeling quickly
   Next, design a system where the author uses a use case diagram describing the interaction relationship between all users and the system. The database design is described using a physical entity relational database.

3. Prototype system
   In the construction phase of system development the PHP codeigniter 4 framework is the backend and the MySQL database is the DBMS system management database.
4. Deployment delivery & feedback
   The next stage is the use of prototypes for all system users to determine in detail the user's level of understanding and evaluate the details of the system.

3. RESULT AND ANALYSIS

3.1.System Design

The results of system analysis are described by the author using a use case diagram which is explained in Figure 1 so that it can easily explain the relationship between system users and their interactions with the system [10], [11]. There are four actors in the designed system, namely the head of the program, curriculum, admin, and lecturer. The role of actors in the system is divided into three sub-systems, namely the program outcome setting, academic setting, and course learning outcome (CLO) setting.

3.1.1. Program outcome setting

In this sub-system two actors interact with the system, namely the curriculum which plays a role in entering Program Educational Objectives (PEO) data, program learning outcome (PLO) data, Graduate Profile data, and graduate profile competencies data, course distribution profile, and PLO settings, then the actor head of the program plays a role in viewing curriculum data that has been previously entered as well as a summary report of the achievements of each student course both collectively and individually, and finally the summary report of achievements until the end of the study period.

3.1.2. Academic setting

The actor admin system manages academic data, and creates lecture classes involving course data, student data, and lecturer data, while lecturer actors interact by viewing detailed lecture class data.

3.1.3. Course learning outcome setting

Actors involved in this sub-system are lecturers who interact with the system by entering CLO data in the classes being taught, then setting rubrics for the types of assessments in their classes, setting the percentage of course assessments, and conducting assessments, while the actor head of the program interacts with view achievement reports both collectively in class and individually.

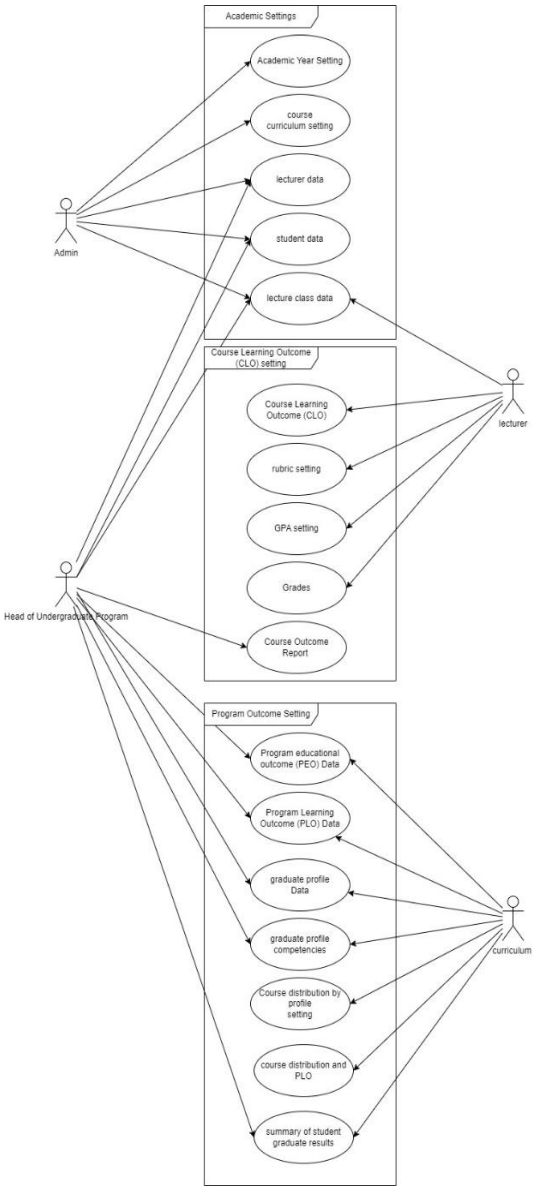

Figure 1. Use case diagram system

To get an overview of the flow of the system design as a whole the author describes system activities using the activity diagram in Figure 2. In the Course

learning outcome setting activity, it is the most decisive activity in presenting the outcomes obtained by students, this activity begins with how the lecturer uses the learning method, the media learning resources used, and the assessor of student learning in order to achieve results [12]. Next is the grouping of courses based on PLO and the target profile of graduates that the study program expects to achieve after completing their study period as illustrated in Figure 3. These results will later be used as evaluation material for the curriculum team.

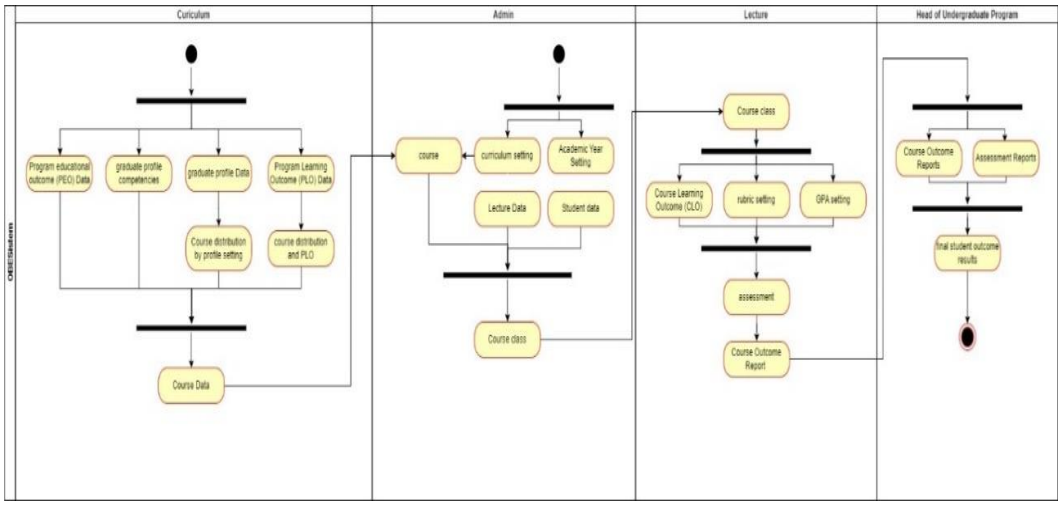

Figure 2. Activity diagram system

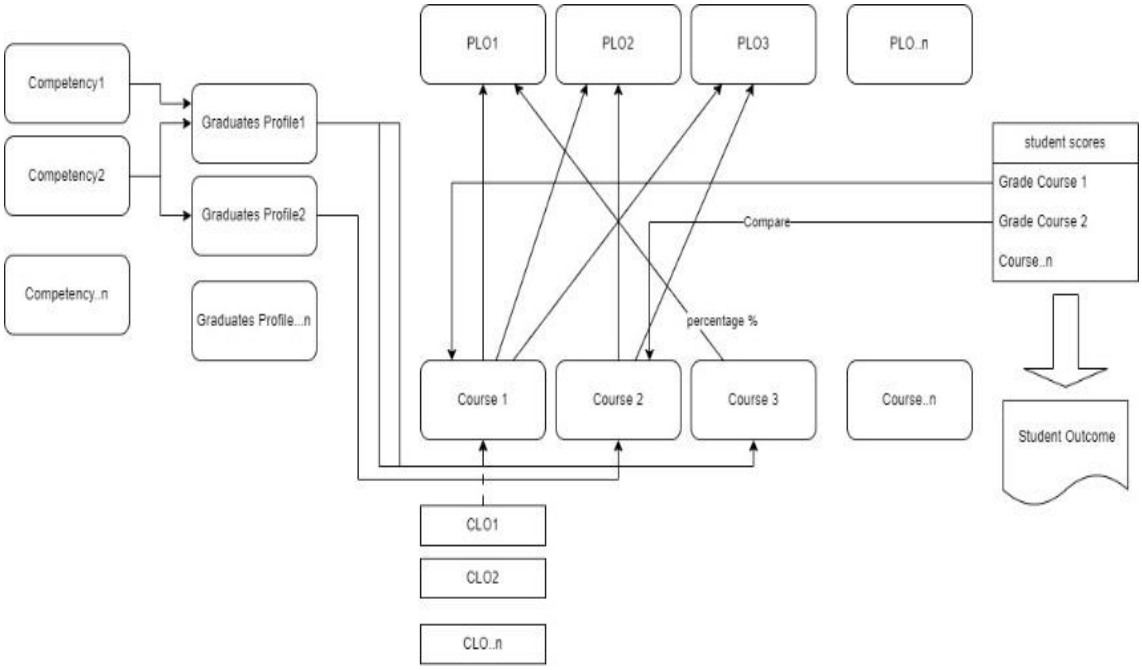

Figure 3. The flow of the outcome assessment scheme

JSI : Jurnal Sistem Informasi *(E-Journal), VOL. 16, NO.1, April* 2024
ISSN Print : 2085-1588
ISSN Online :2355-4614
LINK: https://jsi.ejournal.unsri.ac.id/index.php/jsi/index

The design of this system database is illustrated using a physical entity relational database (ERD) diagram, where a table relationship is produced as shown in Figure 4.

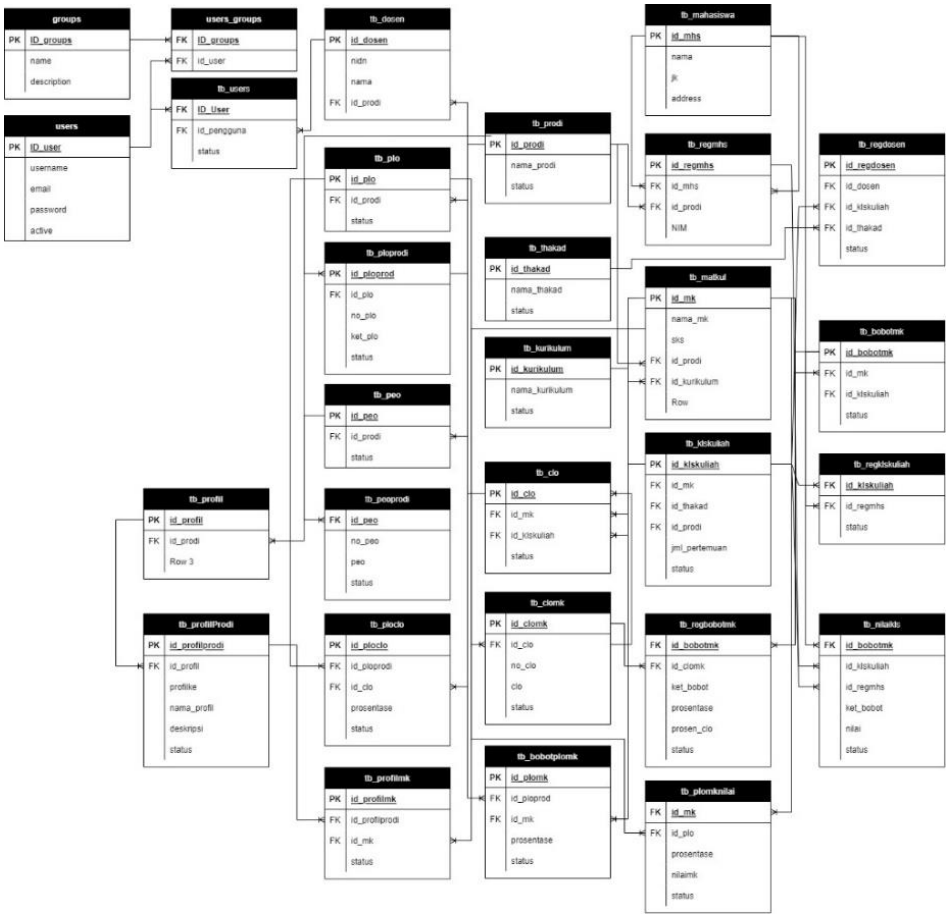

Figure 4. Diagram ERD system

3.2.Program Results

The results of the development program using the PHP Codeigniter 4 framework obtained a system prototype in accordance with the design scheme, namely curriculum actors entering PEO data, PLO, graduate profiles, grouping courses based on graduate profiles as shown in Figure 5, and the distribution of the percentage of courses to PLO as shown in Figure 6.

JSI : Jurnal Sistem Informasi *(E-Journal), VOL. 16, NO. 1, April* 2024
ISSN Print : 2085-1588
ISSN Online :2355-4614
LINK: https://jsi.ejournal.unsri.ac.id/index.php/jsi/index

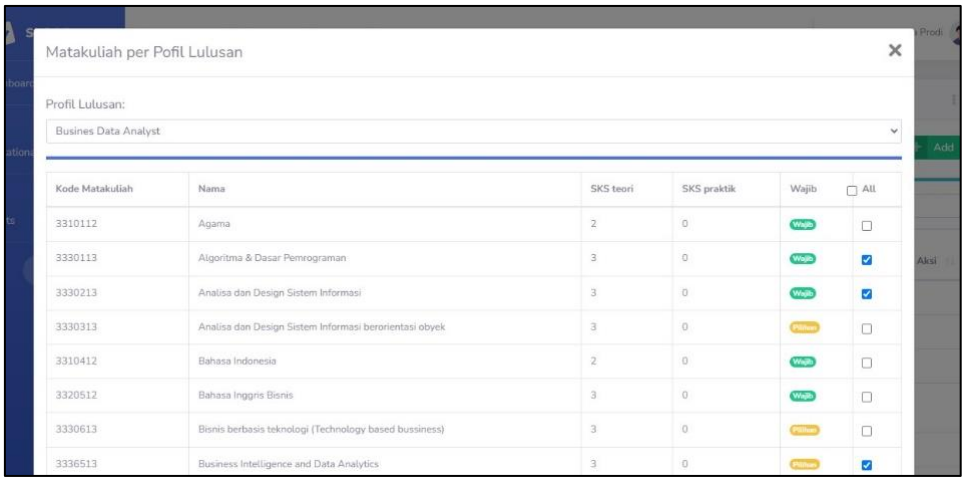

Figure 5. Grouping courses based on graduate profiles

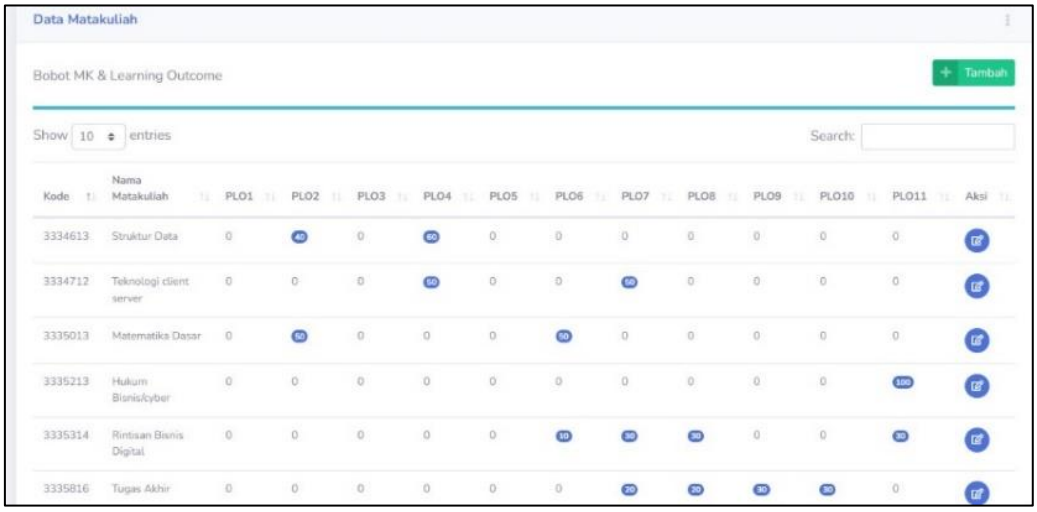

Figure 6. Determination of the percentage of courses based on PLO

Figure 7 shows individual student achievement results which are presented in a bar chart so that lecturers can compare them with course achievement standards (CLO) easily. Furthermore, by repeating the flow of the process of assessing course learning outcomes until the end of the study period in more detail the system can be presented in Figure 8

JSI : Jurnal Sistem Informasi *(E-Journal), VOL. 16, NO.1, April* 2024
ISSN Print : 2085-1588
ISSN Online :2355-4614
LINK: https://jsi.ejournal.unsri.ac.id/index.php/jsi/index

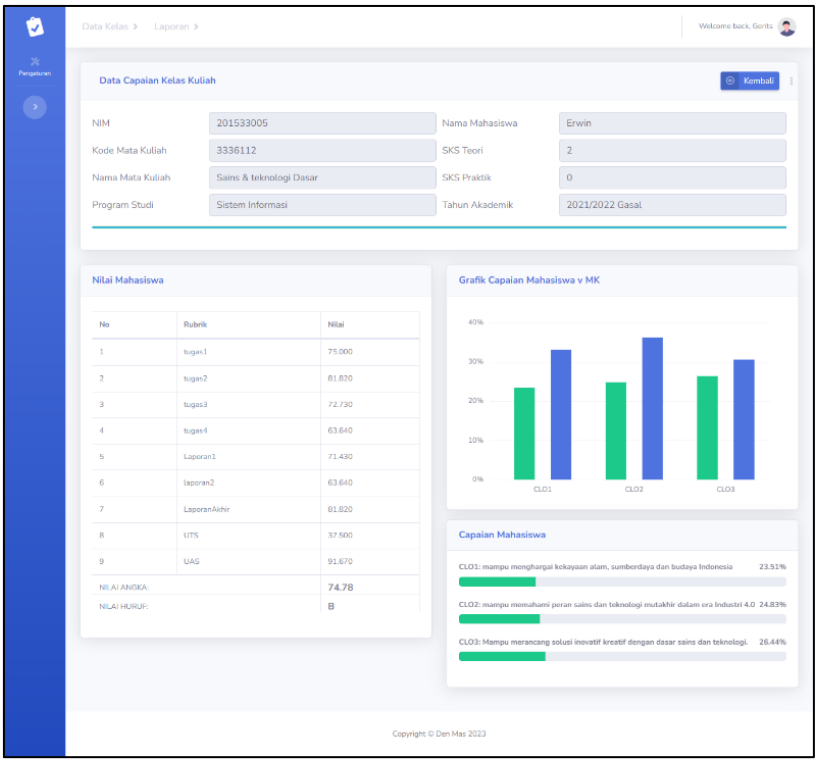

Figure 7. Student achievement results for courses

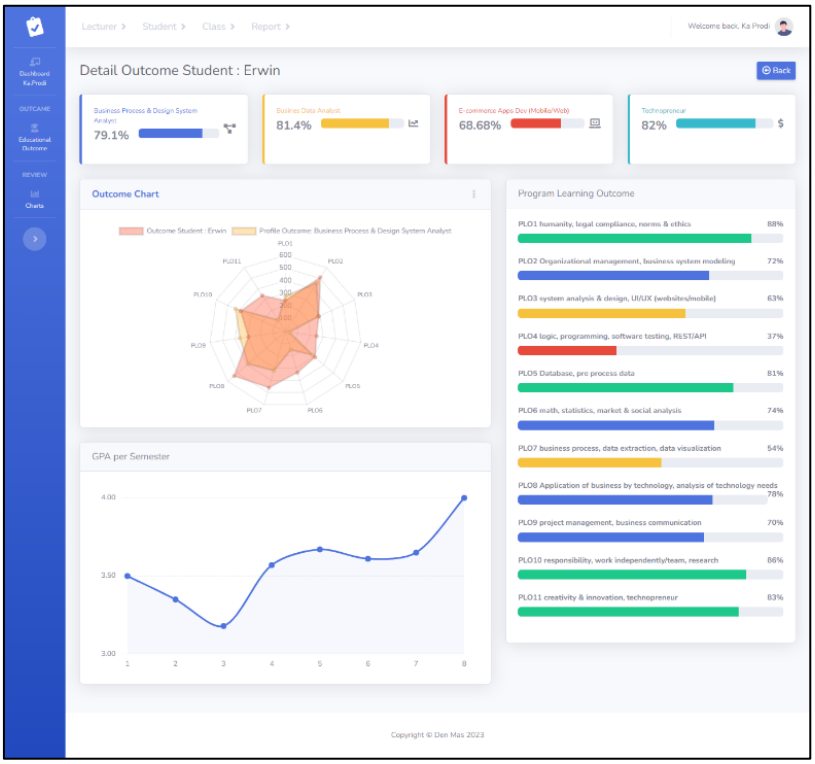

Figure 8. Student achievement results on graduate profiles

More detailed achievement information is displayed by the system by showing the percentage of student graduate profiles where in the example student data the level of compatibility of the two graduate profiles is obtained which is equal to 81.4% as a business data analyst and 82% as a technopreneur. In addition, data on the development of the GPA per semester are also displayed as historical data on the development of student studies. Other data support is presented by the system through a radar chart with the suitability of PLO 2 and PLO 8, each of which shows the characteristics of student competence in organizational management, business system modeling, and analysis of appropriate technological needs in business applications. The progress bar chart shows the percentage of student success in achieving PLO in curriculum design, from an example of a student's study results the following analysis can be produced, armed with the ability to carry out organizational management, modeling business systems, analytical skills in applying the right technology to business and support with an understanding of database processing, understanding legal norms, having humanitarian norms, and having innovation and creativity results in a level of compatibility to the profile of graduates as a business data analyst or a technopreneur rather than being a program developer programmer.

4. CONCLUSION

The conclusion from this research is that the development of an OBE-based assessment information system provides complete information on student achievements, starting from course achievements, and achievements on PLO to achievements on graduate profiles that have been compiled by the study program curriculum. The information presented with the help of bar charts for course achievements and radar charts to map student competencies and abilities after completing all their studies is an illustration of the results of the learning experience that has been passed in accordance with the mapping of graduate profiles correctly and can be used as evaluation material for the future. However, the authors feel that there are still a number of things such as detailed aspects of student soft skills that need to be considered for inclusion in further research so as to produce complete outcome information on student abilities.

REFERENCES

[1] F. X. A. P. ; Jampur and D. J. D. H. Santjojo, “Implementasi sistem informasi penilaian berbasis capaian pembelajaran menggunakan codeigniter 4,” *JSI : Jurnal Sistem Informasi (E-Journal)*, no. 2, pp. 2814–2826, 2022.

[2] N. Mohd Zain, A. Hadi, and K. Abdul Hamid, “European Journal of Education Studies OUTCOME BASED EDUCATION: A PERCEPTION FROM PRIVATE HEALTH SCIENCES GRADUATING SCHOLARS IN MALAYSIA”, doi: 10.5281/zenodo.160233.

[3] W. G. Spady, *Outcome-based education : critical issues and answers*. American Association of School Administrators, 1994.

[4] S. Pai and G. Upadhyaya, "INDONESIAN JOURNAL OF EDUCATIONAL RESEARCH AND REVIEW Effective Implementation of Outcome-based Education: The Role of Faculty Awareness," vol. 4, pp. 380–391, 2021, doi: 10.23887/ijerr.v4i2.

[5] T. Penyusun, *Panduan Penyusunan Kurikulum Pendidikan Tinggi*. 2020.

[6] A. Aminuddin, R. Salambue, Y. Andriyani, E. Mahdiyah, P. Studi Sistem Informasi, and U. Riau, "APLIKASI E-OBE UNTUK INTEGRASI KOMPONEN KURIKULUM OBE (OUTCOME-BASED EDUCATION)," *JSI : Jurnal Sistem Informasi (E-Journal)*, vol. 13, no. 1, 2021, [Online]. Available: http://ejournal.unsri.ac.id/index.php/jsi/index

[7] B. Kushari and L. Septiadi, "A LEARNING OUTCOME ASSESSMENT INFORMATION SYSTEM TO FACILITATE OUTCOME-BASED EDUCATION (OBE) IMPLEMENTATION," *Jurnal Pendidikan Teknologi dan Kejuruan*, vol. 28, no. 2, pp. 238–250, 2022, doi: 10.21831/jptk.v28i1.42339.

[8] J. Qadir *et al.*, "Outcome-Based Engineering Education: A Global Report of International OBE Accreditation and Assessment Practices."

[9] A. Susanto and ; Meiryani, "System Development Method with The Prototype Method," *INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH*, vol. 8, p. 7, 2019, [Online]. Available: www.ijstr.org

[10] M. Fowler, *UML Distilled Edisi 3 panduan Singkat Bahasa Pemodelan Objek Standar Edisi 3*. Yogyakarta: Andi, 2005.

[11] B. Jeffrey L, Whitten; Lonnie D, *Analysis and Design Methods.*, vol. 18, no. 4. New York: McGraw-Hill, 2007. doi: 10.5459/bnzsee.18.4.329-336.

[12] Zulfadli, S. A. Mokhtar, S. Puteh, and S. M. S. Anuar, "OBE measurement system in Malaysian institute of information technology Universiti Kuala Lumpur," in *Proceedings - International Conference on Intelligent Systems, Modelling and Simulation, ISMS*, IEEE Computer Society, Sep. 2015, pp. 12–17. doi: 10.1109/ISMS.2014.10.