Research Article

Digitization of Student Activity Assessment and Reporting at Kampar Polytechnic

[1,*]**Fenty Kurnia Oktorina**

[1] Diploma III in Informatics Engineering, Kampar Polytechnic, Indonesia

* Corresponding Author: fenty@poltek-kampar.ac.id

Abstract: Students in higher education institutions are expected to actively participate in various academic and non-academic activities to develop their potential. At Politeknik Kampar, student activity records are still managed manually by the Student Affairs Administration Division (BAK), which leads to difficulties in obtaining valid and organized data. This research aims to build a Digital Assessment system of student activities at Kampar Polytechnic whose purpose is to facilitate the process of managing student participation data. Especially evaluation and reporting. The method used is the development of the System Development Life Cycle (SDLC). The programming language used in this research is PHP with the Laravel Framework, this framework is known for its good data management and accuracy and has structured data management. The result of this research is the development of an application that will focus on the process of reporting activities carried out by students directly, in real-time, and can be monitored and validated directly. With this system, it is ensured that the management of student activities can be more organized, transparent, and accessible to students, BAK, and all related parties.

Keywords: Digitalization of Assessment, Digitalization of Reporting, student activities, SDLC, UML.

Citation: Oktorina, F. K. (2025). Digitization of student activity assessment and reporting at Politeknik Kampar. *Iota, 5(2).* https://doi.org/10.31763/iota.v5i2.912

Academic Editor: Adi, P.D.P

Received: April 03, 2025

Accepted: April 14, 2025

Published: May 05, 2025

1. Introduction

Student activities are one of the most effective forms of organized engagement for developing students' potential. One effort to increase student engagement is by encouraging their participation in various extracurricular activities, both on and off campus. These activities include events, competitions, workshops, and online programs such as seminars or training sessions conducted through platforms like Zoom, which help broaden students' knowledge and skills.

Some higher education institutions even require students to actively participate in organizations to expand their networks, develop leadership qualities, and improve public speaking skills. Proper documentation and management of student activity data is a crucial aspect that requires fast and accurate data processing to avoid delays in recap and data retrieval processes (Vascolino Pattipeilohy & Febiyola Wijaya, 2020; Sibagariang et al., 2021).

Politeknik Kampar, a higher education institution located at Tengku Muhammad Street KM.2, Batu Belah, Bangkinang District, Kampar Regency, Riau 28463, offers a wide range of campus activities that students can participate in. These include soft skills development programs, Student Activity Units (UKM), student organizations, and off-campus activities. Each student activity is recorded and documented for administrative purposes.

Currently, the student activity data at Politeknik Kampar is managed by the Student Affairs Administration Division (BAK). The process is done manually, where data is collected from participating students and then entered into spreadsheet applications like Excel by BAK staff. However, this method has several drawbacks, including fragmented files and the potential for data inconsistencies. Moreover, this system does not provide immediate feedback to students regarding their participation records.

The water source for this smart dispenser will be provided by a trusted partner, Wahdah Water. Wahdah Water is a company that focuses on supplying high-quality drinking water in gallon form. Wahdah Water ensures that each gallon of water distributed undergoes stringent filtration and processing to guarantee its cleanliness and health standards. Collaboration with Wahdah Water ensures that the water available in these smart dispensers meets strict quality standards and is safe for public consumption.

These limitations in data management make it difficult for BAK to obtain valid and complete data. Not all students are proactive in reporting their participation when asked to fill out activity forms. Therefore, to improve data management efficiency, the Web-Based Point System of Politeknik Kampar was developed. This system is designed to make it easier for students to report their activities while allowing BAK to manage the data more quickly and accurately. In addition, Heads of Study Programs (Kaprodi) and Academic Advisors can monitor student engagement each semester.

An information system is essentially a collection of data that is gathered, classified, and processed to produce structured information. With a web-based information system, it is expected that data management processes can be improved and work can be accelerated, as websites can deliver real-time information across a wide network (Salsabila et al., 2023).

Based on the background described above, the author conducted a study titled Digitization of Student Activity Assessment and Reporting at Politeknik Kampar. It is hoped that this information system can be effectively and efficiently utilized by all stakeholders through the implementation of the point system.

Moreover, to make changes to the student monitoring and evaluation system, it is necessary to make changes to the information system that is flexible and capable of covering big data and involving telecommunications systems and the Internet of Things (IoT), so that data can be obtained in real-time, and a system that can be recorded in a powerful database for data provision is needed. (D. Wang and R. Wang, 2023), (H. Kamil and S. R. Lasmana, 2024), (A. Aribowo., et.al, 2024), (D. Wang and R. Wang, 2023), Some research projects in building student evaluation systems are carried out using Machine Learning Algorithms by conducting detailed analysis on the Support Vector Machines (SVM) Learning Model (F. Cheng, 2022), (Y. Tang, 2023), (X. Xing., et.al, 2022), (M. Chen and Y. Zhang, 2022), (W. Yanxia, 2022), & (Y. Wang and Y. Sun., 2023).

2. Literature Review

2.1 Research Results from Other Researchers on Digitization of Student Activity

In the research conducted by (Salsabila et al., 2023), the issue of the Student Certificate and Credit Point Management Information System was addressed. This research used the SDLC (Software Development Life Cycle) method, and the system design was created using the UML (Unified Modeling Language) method. In the development of this software, PHP was used as the scripting language to create the website pages, and MySQL was used as the database. The final result of this research is an information system that helps the information systems study program in the storage and calculation of credit points.

A study titled Design and Prototype of the Gamified Student Credit Point Information System Application with the "*Bela Negara*" Narrative was conducted by (Oktavian et al., 2024). This research used the Waterfall method, and system requirements were created using the UML (Unified Modeling Language) method. The final result of this research is a Student Credit Point System (SKPM) information system that automates the process of recording, assessing, and reporting student credit points.

In the research conducted by (Utsalina, 2021), the issue of creating an online attendance system and punishment system at SMK MAA'ARIF NU 04 Pakis, based on a website, was addressed. This research used the Waterfall method, and system requirements were created using the UML (Unified Modeling Language) method. The final result of this research is an online attendance system using MySQL for data storage. This has improved time efficiency in the attendance recording process and can determine the punishment points assigned to students by 4.6%, while also streamlining the time required for the admin to manage data.

(Feriawan et al., 2024) Conducted research on the design and development of the Management Information System for Student Activity Transcripts at Promakara University using the Extreme Programming method. This research used the SDLC (Software Development Life Cycle) software development method, and system requirements were created using the UML (Unified Modeling Language) method. The system was implemented using Next.js and JavaScript, along with black-box testing. The final result of this research is a system that functions to improve the efficiency of managing TAK, facilitates real-time monitoring of TAK points, and supports the holistic development of students' soft skills.

In the research conducted by (Ayunandita & Dadi Riskiono, 2021), the issue of modeling an academic information system using Extreme Programming at Madrasah Aliyah (MA) Mambaul Ulum Tanggamus was addressed. This research used the SDLC (Software Development Life Cycle) software development method, and system requirements were created using the UML (Unified Modeling Language) method. The system was implemented using PHP programming language and MySQL database. The final result of this research is a system that was tested using the Technology Acceptance Model (TAM), and the results showed that 85% of users agreed that the Academic Information System at Madrasah Aliyah Mambaul Ulum Tanggamus significantly helped with the recording and assessment process using a web-based system and violation points through SMS Gateway.

Conducted research on the design and development of a Student Violation Point Information System (Case Study: SMAN 8 Bekasi), (Febrianti & Astriratma, 2021). This research used the Waterfall method, and system requirements were created using the UML (Unified Modeling Language) method. The system was implemented using PHP programming language and MySQL database. The final result of this research is a website-based student violation point information system at SMAN 8 Bekasi. The expectation is that this system will monitor students' willingness to comply with school regulations.

3. Method

3.1 SDLC Method

This research uses the SDLC, a method employed in information system development to ensure the project runs effectively and efficiently. SDLC consists of several structured and systematic phases to manage the system development process. These phases can be seen in the following diagram in Figure 1.

The first stage of the SDLC method is Planning, which involves identifying the project's requirements, determining objectives, defining the scope, and estimating resources (time, cost, and workforce). The team also identifies potential risks and prepares a project plan. In this stage, the author applies a qualitative approach through observation and interviews. The data gathered will be processed in the development of the information system according to the SDLC framework.

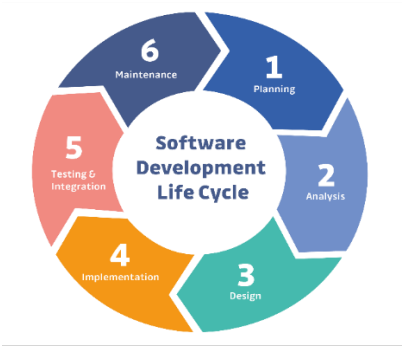

Figure 1. Phases of the SDLC Method

The next stage is Analysis, where user and system requirements are analyzed in detail. The team discusses with stakeholders to understand business objectives and creates specifications for both functional and non-functional requirements. For this research, the author will analyze the mapped requirements, including user needs, hardware needs, data and information requirements, and procedure analysis, as well as the instruments used and produced. The data and information gathered from observations and interviews will be analyzed into functional requirements. These mapped functional requirements may continue to evolve until the final results are agreed upon by the stakeholders.

The third stage is Design, where a detailed system design is created, including architecture design, user interface (UI/UX), and the database. The result of this phase is typically a technical design document or a prototype.
Next is the Implementation stage, where the design is translated into program code by the development team. Each module is programmed and integrated into a complete application.

Following that is Testing & Integration, where the developed application is thoroughly tested to ensure it is free from bugs and errors. Testing can include unit, integration, system, and acceptance testing. Afterward, the system is integrated into the production environment.

The final stage is Maintenance. In this phase, routine monitoring and maintenance are carried out to ensure the system's performance and reliability. Updates and system improvements will be made as the requirements evolve, and technical support will be provided to resolve any emerging issues.

4. Result and Analyzes

4.1 Implementation System

In the Implementation Process, there are several essential components including the Graphical User Interface (GUI) which are connected in this information system, starting from Login, Dashboard, student point recap, and other components, discussed at the following points:

4.1.1 Login Page Implementation

The following is the implementation results of the Web-Based Student Credit Point Information System at Politeknik Kampar. This can be seen in Figure 2.

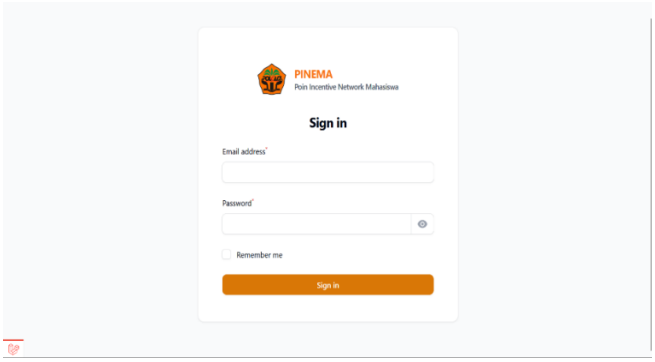

Figure 2. Login Page Implementation

Figure 2 shows the implementation of the access rights page. On this page, users are required to log in. The username and password will then be validated to proceed to the next page.

4.1.2 Dashboard Page Implementation

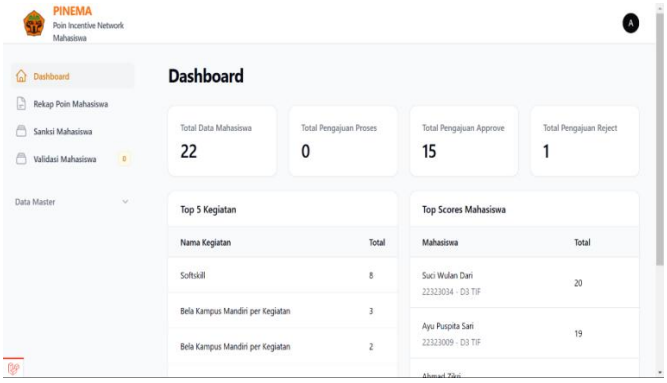

Figure 3. Dashboard Page Implementation

Figure 3 shows the implementation result after logging in. On this page, BAAK can view information such as the total number of student records, total submissions in process, total approved submissions, total rejected submissions, the top 5 most popular activities, and the top-scoring students.

4.1.3 Student Point Recap Page Implementation

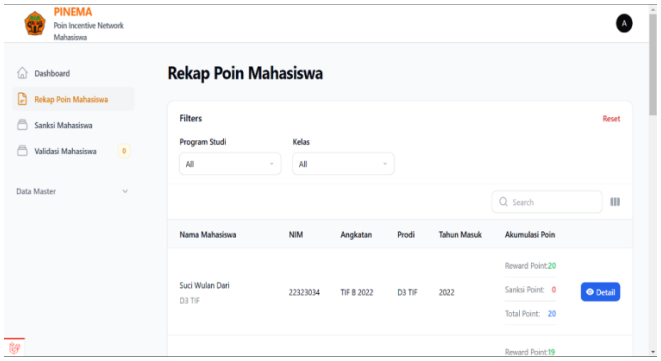

Figure 4. Student Point Recap Page Implementation

Figure 4 shows the implementation of the student point recap page. This page is used to view the summary of student points and includes a button to view detailed activity information. It also provides filters for study programs and class levels.

4.1.4 Student Sanction Page Implementation

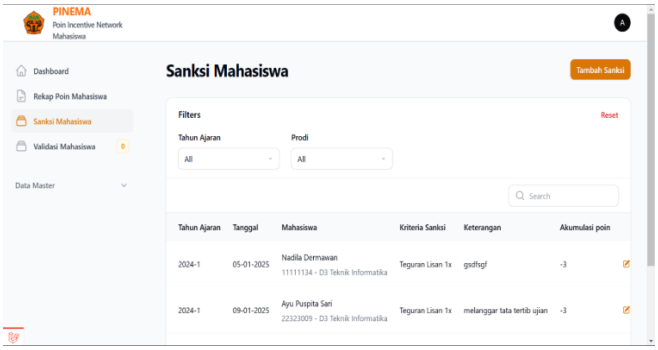

Figure 5. Student Point Recap Page Implementation

Figure 5 shows the implementation of the student sanction page. On this page, users can view the sanction data that has been assigned to students. There is also an "Add Sanction" button, which is used to assign new sanctions to students. Filters are available for selecting the academic year and study program. Additionally, each student sanction entry includes an "Edit" button to reassign a sanction and a "Delete" button to remove a sanction.

4.2 System and Program Testing

The final step in the development process of the Politeknik Kampar Point System Information System is the system and program testing phase. The testing was conducted using Black Box Testing, and the results confirmed that the system functions as expected.

4.3 Discussion of the Program Code

The program code used in the development of the Politeknik Kampar Point System Information System based on a website is as follows Figure 6, Configuring a Database with Laravel.

```
DB_CONNECTION=mysql
DB_HOST=127.0.0.1
DB_PORT=3306
DB_DATABASE=apps-sipk
DB_USERNAME=root
DB_PASSWORD=
```

Figure 6. Program Code for Database Configuration

Figure 6 shows the code for configuring the MySQL database. Line 24 sets the database connection to MySQL, line 25 specifies the localhost used, line 26 configures the port, line 27 configures the database name that has been created, line 28 configures the database username, and line 29 configures the database password.

4.4 Login Page

4.4.1 View

```
use Filament\Pages\Auth\Login;

class PanelPanelProvider extends PanelProvider
{
    public function panel(Panel $panel): Panel
    {
        return $panel
            ->default()
            ->id('panel')
            ->path('')
            ->login()
            ->brandWidth('18rem')
            ->breadcrumbs(false)
            ->colors([
                'primary' => Color::Amber,
            ])
            ->brandName(fn() => view('components.brandlogo'))
            ->favicon(asset('img/alm.png'))
            ->discoverResources(in: app_path('Filament/Resources'), for:
'App\\Filament\\Resources')
            ->discoverPages(in: app_path('Filament/Pages'), for:
'App\\Filament\\Pages')
            ->pages([
                Pages\Dashboard\Index::class,
            ])
            ->discoverWidgets(in: app_path('Filament/Widgets'), for:
'App\\Filament\\Widgets')
            ->widgets([
                Stats\OverviewMin::class,
                Stats\OverviewDashboard::class,
                TopScores::class,
                TopScoresMahasiswa::class
            ]);
    }
}
```

Figure 7. Code for the Login Page View

Figure 7 shows the view code for the login page which is displayed according to the desired layout. When creating a panel using Filament, it will automatically generate and create the login page. The appearance can then be customized. Lines 27 to 38 contain the code for displaying and configuring elements on the login page. Lines 39 to 44 are used to display the logo on the login page, and after logging in, the user will be redirected to the dashboard page. Lines 46 to 51 contain the configuration code to customize the content of the dashboard page after login.

4.4.2 Controllers

```
class Login extends SimplePage
{
    use InteractsWithFormActions;
    use WithRateLimiting;

    /**
     * @var view-string
     */
```

```
    protected static string $view = 'filament-panels::pages.auth.login';

    /**
     * @var array<string, mixed> | null
     */
    public ?array $data = [];

    public function mount(): void
    {
        if (Filament::auth()->check()) {
            redirect()->intended(Filament::getUrl());
        }

        $this->form->fill();
    }

    public function authenticate(): ?LoginResponse
    {
        try {
            $this->rateLimit(5);
        } catch (TooManyRequestsException $exception) {
            $this->getRateLimitedNotification($exception)->send();
        }
```

Figure 8. Login Page Controller Code

Moreover, Figure 8 shows the login page controller provided directly by Filament. When creating a login page, the login controller code is automatically generated by Filament.

Furthermore, to determine whether the Web-Based Student Credit Point Information System of Politeknik Kampar is easy to understand and beneficial for the institution, testing needs to be conducted. The following table presents user responses regarding the use of the developed Web-Based Student Credit Point Information System at Politeknik Kampar. Out of 10 respondents (5 students, 1 vice director, 2 BAAK staff, 1 academic advisor, and 1 head of study program), most users gave positive feedback: each question received between 4–7 "strongly agree" and 3–6 "agree" responses, indicating that the system is well-received and considered useful and effective.

5. Conclusion

Based on the analysis and research results, it can be concluded that the Web-Based Point System Information System of Politeknik Kampar has been successfully developed. Firstly, the system was successfully designed using UML (Unified Modeling Language) as a modeling tool. Secondly, the information system was successfully implemented and realized in the form of a functional website.The System Development Life Cycle (SDLC) method is considered very effective in building flexible and dynamic Website-based Information Systems, so that SDLC can still be developed for future Website design and with detailed analysis in design and search.

Acknowledgments: The research team would like to express their gratitude to the Research and Community Service Center of Politeknik Kampar for providing research grant funding under contract number 003/KP-P3M/04.2025.

Author contributions: The authors are responsible for building Conceptualization, Methodology, analysis, investigation, data curation, writing—original draft preparation, writing—review and editing, visualization, supervision of project administration, funding acquisition, and have read and agreed to the published version of the manuscript.

Funding: The study was conducted without any financial support from external sources.

Availability of data and Materials: All data are available from the authors.

Conflicts of Interest: The authors declare no conflict of interest.

Additional Information: No Additional Information from the authors.

References

[1] Aisah, A. dan Sugiyono, S. (2021) "Implementasi sistem penggajian pada PT. Dwi Pratama Teknik dengan metode PIECES," Jurnal Manajamen Informatika Jayakarta, 1(4), hal. 384. Tersedia pada: https://doi.org/10.52362/jmijayakarta.v1i4.545.

[2] Ayunandita, N. dan Dadi Riskiono, S. (2021) "Permodelan Sistem Informasi Akademik Menggunakan Extreme Programming Pada Madrasah Aliyah (Ma) Mambaul Ulum Tanggamus," Jurnal Informatika dan Rekayasa Perangkat Lunak (JATIKA), 2(2), hal. 196–204. Tersedia pada: http://jim.teknokrat.ac.id/index.php/informatika.

[3] Febrianti, D.A. dan Astriratma, R. (2021) "Rancang Bangun Sistem Informasi Poin Pelanggaran Siswa (Studi Kasus : SMAN 8 Bekasi)," Seminar Nasional Mahasiswa Ilmu Komputer dan Aplikasinya (SENAMIKA), (September), hal. 411–419.

[4] Feriawan, I.P.S. dkk. (2024) "Aktivitas Kemahasiswaan Primakara University Menggunakan Metode Extreme Programming," 8(5), hal. 10162–10169.

[5] Mehdila, U. (2024) "IJIS Indonesian Journal on Information System ISSN 2548-6438," IJIS-Indonesia Journal on Information System, 4(April), hal. 69–76. Tersedia pada: https://media.neliti.com/media/publications/260171-sistem-informasi-pengolahan-data-pembeli-e5ea5a2b.pdf.

[6] Oktavian, M.D.S. dkk. (2024) "Desain dan Prototype Aplikasi Gamifikasi Sistem Informasi Satuan Kredit Poin Mahasiswa Bernarasi ' Bela Negara ,'" 4, hal. 139–149.

[7] Pattipeilohy, V. dan Wijaya, F. (2020) "Implementasi Model Collaborative Learning: Sebagai Landasan Untuk Membangun Ketrampilan Sosial Dan Keaktifan Mahasiswa," Jurnal Maneksi, 9(1), hal. 283–289. Tersedia pada: https://doi.org/10.31959/jm.v9i1.325.

[8] Salsabila, S., Ade Pratama dan Anggri Yulio Pernanda (2023) "Sistem Informasi Pengelolaan Sertifikat dan Kredit Poin Mahasiswa," Decode: Jurnal Pendidikan Teknologi Informasi, 3(1), hal. 38–45. Tersedia pada: https://doi.org/10.51454/decode.v3i1.70.

[9] Sibagariang, S. dkk. (2021) "Rancang Bangun Aplikasi Sistem Informasi Organisasi Mahasiswa (SIOMAH)," Jurnal Mahajana Informasi, 6(2), hal. 54–60. Tersedia pada: https://doi.org/10.51544/jurnalmi.v6i2.2446.

[10] Utsalina, D.S. (2021) "Sistem Presensi Online Dan Poin Di Smk Maa'Arif Nu 04 Pakis Berbasis Web," Jurnal Technopreneur (JTech), 9(2), hal. 79–83. Tersedia pada: https://doi.org/10.30869/jtech.v9i2.759.

[11] D. Wang and R. Wang, "Research and design of college student classification Management information system based on Big data technology," 2023 8th International Conference on Information Systems Engineering (ICISE), Dalian, China, 2023, pp. 176-179, doi: 10.1109/ICISE60366.2023.00043.

[12] H. Kamil and S. R. Lasmana, "Development of Gamification for Student Participation Management Information System," 2024 2nd International Symposium on Information Technology and Digital Innovation (ISITDI), Bukittinggi, Indonesia, 2024, pp. 330-335, doi: 10.1109/ISITDI62380.2024.10796339.

[13] A. Aribowo, Hery, Y. I. Mokalu, A. E. Widjaja and C. A. Haryani, "Examining Student Acceptance and Attitudes Toward the Learning Management System Through the Lens of the Technology Acceptance Model and the Information System Success Model," 2024 10th International Conference on Education and Technology (ICET), Malang, Indonesia, 2024, pp. 102-107, doi: 10.1109/ICET64717.2024.10778473.

[15] F. Cheng, "Application of decision tree in student information management system," 2022 International Conference on Artificial Intelligence in Everything (AIE), Lefkosa, Cyprus, 2022, pp. 316-321, doi: 10.1109/AIE57029.2022.00068.

[16] Y. Tang, "Intelligent Chemical Student Management Information System Based on Data Mining Algorithm," 2023 9th Annual International Conference on Network and Information Systems for Computers (ICNISC), Wuhan, China, 2023, pp. 304-309, doi: 10.1109/ICNISC60562.2023.00106.

[17] X. Xing, X. Zhang and Q. Zhang, "Construction of Intelligent Student Management Information System Platform Based on Big Data Analysis," 2022 IEEE Asia-Pacific Conference on Image Processing, Electronics and Computers (IPEC), Dalian, China, 2022, pp. 1229-1232, doi: 10.1109/IPEC54454.2022.9777622.

[18] M. Chen and Y. Zhang, "Design and Implementation of Student Information Management System based on Web," 2022 International Conference on Computers, Information Processing and Advanced Education (CIPAE), Ottawa, ON, Canada, 2022, pp. 49-52, doi: 10.1109/CIPAE55637.2022.00020.

[19] W. Yanxia, "Student Information Management Decision System Based on Decision Tree Classification Algorithm," 2022 IEEE

5th International Conference on Information Systems and Computer Aided Education (ICISCAE), Dalian, China, 2022, pp. 827-831, doi: 10.1109/ICISCAE55891.2022.9927597.

[20] Y. Wang and Y. Sun, "Construction of an Artificial Intelligence Student Management Information System Under Big Data Analysis Algorithms," 2023 2nd International Conference on Artificial Intelligence and Intelligent Information Processing (AIIIP), Hangzhou, China, 2023, pp. 61-65, doi: 10.1109/AIIIP61647.2023.00017.