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JITK (JURNAL ILMU PENGETAHUAN DAN TEKNOLOGI KOMPUTER)

DEVELOPMENT OF INFORMATION SYSTEM FOR EMPLOYEE PERFORMANCE ASSESSMENT AT HASNUR CENTRE USING 360° ASSESSMENT

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Abstract—*Hasnur Centre is the CSR institution of Hasnur Group dedicated to the development of human resources in South Kalimantan. The performance assessment for Hasnur Centre employees currently relies on a conventional and unidirectional brief fill-in-the-blank method, reflecting the viewpoint of superior, indicating a need for an adjustment in the employed method. Furthermore, the employee evaluation process at Hasnur Centre still relies on a simple Google Form. Therefore, there is a need for the development of information system integration that can automate employee performance assessment at Hasnur Centre. The system is developed gradually according to the needs of the HR Admin, utilizing the Spiral development method. The tools include Use Case Diagrams, PHP as the programming language, CodeIgniter as the system development framework, and MySQL. This research has resulted in the Employee Performance Assessment Information System for Hasnur Centre employees, introducing a novelty by integrating the 360° Assessment method based on predetermined perspectives and sub-perspectives using a Likert Scale combined with a brief qualitative input method in which evaluators provide written feedback on the assessed employees. The combination of these two methods results in a more measurable, objective, and unbiased performance evaluation, making it a reliable tool for the Executive Director of Hasnur Centre in making decisions related to employee performance.*

Keywords: *360° assessment method, codeigniter, employee performance evaluation, php (hypertext preprocessor), spiral.*

Intisari—Hasnur Centre adalah institusi *CSR* Hasnur Group mengenai pengembangan SDM Kalimantan Selatan. Adapun penilaian kinerja karyawan Hasnur Centre masih menggunakan metode isian singkat pandangan atasan yang masih konvensional dan satu arah sehingga perlu adanya penyesuaian metode yang digunakan. Selain itu, proses evaluasi karyawan Hasnur Centre masih berbasis *Google Form* sederhana. Oleh karena itu, dibutuhkan pengembangan integrasi sistem informasi yang dapat melakukan otomatisasi penilaian kinerja karyawan di Hasnur Centre. Sistem ini dikembangkan secara bertahap sesuai kebutuhan *HR Admin* sehingga metode pengembangan sistem menggunakan *Spiral* dengan *tools Use Case Diagram*, *PHP* sebagai bahasa pemrograman, *CodeIgniter* sebagai *framework* pengembangan sistem, dan *MySQL*. Penelitian ini menghasilkan Sistem Informasi Penilaian Kinerja Karyawan Hasnur Centre dengan kebaruan berupa menggabungkan metode *360° Assessment* berdasarkan perspektif dan sub-perspektif yang ditetapkan berbasis *likert scale* dengan metode isian singkat berupa pandangan kualitatif dari penilai terhadap karyawan yang dinilai. Hasil pengukuran penggabungan kedua metode ini menghasilkan penilaian kinerja karyawan yang lebih terukur, objektif, dan tidak bias sehingga dapat digunakan sebagai pengambilan keputusan Direktur Eksekutif Hasnur Centre berkaitan dengan kinerja karyawan.

Kata Kunci: *Metode penilaian 360°, codeigniter, evaluasi kinerja karyawan, php (hypertext preprocessor), spiral.*

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INTRODUCTION

The Hasnur Centre is the CSR institution of the Hasnur Group focusing on the development of human resources in South Kalimantan [1]. CSR is defined as the company's obligation in developing the human resources of the surrounding area where the company operates [2]. The presence of CSR has a positive impact on the community and the surrounding area of the company [3], including the recruitment of 400 individuals from the local community as employees of Hasnur Centre [4]. In evaluating employees at Hasnur Centre, a performance assessment is conducted every three months. The performance assessment at Hasnur Centre still utilizes a brief fill-in-the-blank approach where the supervisor provides feedback on the evaluated employee. This represents a conventional unidirectional performance assessment method, resulting in less objectivity and measurability [5] when compared to the 360° Assessment method.

The 360° Assessment method is a relatively new performance evaluation approach for employees in performance management, implemented in various organizations, both in the public and private sectors [6]. By incorporating aspects such as habits, capabilities, and skills of employees [5], the 360° Assessment method allows employees to receive performance evaluations from multiple perspectives, including self-assessment, peer assessment, subordinate assessment, and supervisor assessment [7], based on Likert scale-based perspectives and sub-perspectives [8]. However, the 360° Assessment method still faces challenges of bias in providing numeric-based assessments [5]. Therefore, to ensure that employee performance evaluations at Hasnur Centre are measurable, objective, and unbiased, a combination of the 360° Assessment method with the brief fill-in-the-blank approach by evaluators is implemented.

However, the employee evaluation process at Hasnur Centre is still based on a simple Google Form. The calculation of assessment results is still done manually on spreadsheets and has not yet transitioned to an integrated information system capable of automating the summary of assessment results. This results in challenges for the HR Admin in manually compiling online employee performance assessment forms every quarter based on the predetermined perspectives and sub-perspectives. Employees also face difficulties in completing the manual hierarchy-based employee assessment. Additionally, HR Admin struggles to individually compile online employee performance assessment results on spreadsheets and create assessment result reports. Consequently, HR Admin faces challenges in accessing real-time employee performance assessment results related to employee performance for decision-making by the Executive Director of Hasnur Centre.

The proposed solution to these issues is to conduct research on the "Development of the Employee Performance Assessment Information System at Hasnur Centre Using the 360° Assessment Method." The development of this system aims to enable the use of the employee performance assessment system as a basis for decision-making by the Executive Director of Hasnur Centre regarding employee performance. The system will be developed gradually according to the needs of HR Admin, employing the Spiral method with six stages, starting from Customer Communication, Planning, Risk Analysis, Engineering, Construction and Release, and Customer Evaluation [9]. The Risk Analysis stage uses Use Case Diagram tools to facilitate UML (Unified Modeling Language) mapping for the system's requirements during the planning process. PHP (Hypertext Preprocessor) is used as the programming language, CodeIgniter as the framework, and MySQL as the database system in the Engineering stage.

MATERIALS AND METHODS

A. Data Collection

The data collection methods utilized in this research include observation, interviews, and literature review as follows.

The observation phase involves the direct observation of the employee performance assessment process at Hasnur Centre on April 15, 2023. The Employee Performance Assessment process at Hasnur Centre encompasses the formulation of online employee performance assessment forms based on predetermined perspectives and sub-perspectives, the distribution of online performance assessment forms to all employees every quarter, the completion of online performance assessment forms by employees using the rating scale method in the 360° Assessment, and the compilation of employee performance assessment results to generate assessment reports by HR Admin.

The interview phase was conducted with the Executive Director of Hasnur Centre on April 20, 2023, involving the collection of supporting data related to the employee performance assessment process at Hasnur Centre. Several findings regarding the employee performance assessment process emerged, including periodic fulfillment of perspectives and sub-perspectives, the use of the rating scale method in the 360° Assessment, challenges faced in organizational performance

assessment, and the needs and objectives of the Hasnur Centre Employee Performance Assessment Information System.

The literature review phase involves studying books and journals related to employee performance assessment, the rating scale method in the 360° Assessment, the Spiral method, UML (Unified Modeling Language), PHP as a programming language, CodeIgniter as a system development framework, and MySQL as a database. Based on the literature review, it is evident that the Hasnur Centre Employee Performance Assessment can objectively monitor and compile employee performance in specific quarters from various perspectives and sub-perspectives as predetermined.

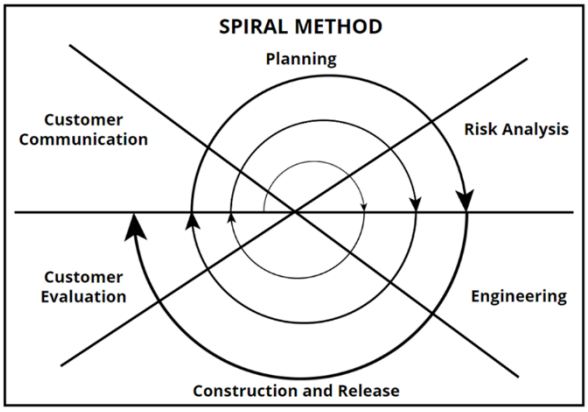
B. Employee Performance Evaluation

The employee performance assessment at Hasnur Centre utilizes the 360° Assessment method every quarter. Employee performance assessment is a formal, open, and objective evaluation [10] conducted by an organization on employee performance to align with the standards established and agreed upon by the company [11]. The 360° Assessment method enables employees to provide objective assessments of their peers, including superiors, subordinates, colleagues, and themselves [12] [13]. The perspectives are further detailed into several sub-perspectives, which are then used as evaluation aspects employing the rating scale method and brief description entries.

The evaluations from employees are accumulated to form the final assessment results, which are then classified into five categories. The final assessment classification results of each employee can only be viewed by the HR Admin. This information is subsequently utilized as a basis for decision-making by the Executive Director of Hasnur Centre regarding the performance of the respective employee.

C. System Design

According to the needs of the HR Admin, the system development process employs the Spiral method every 3 months per feature. The Spiral method is an evolutionary system development approach that progresses linearly and iteratively in a prototype manner [14]. As a result, every 3 months, the development team will engage in the enhancement of HR features in the system, encompassing employee performance assessments, payroll, until integrated attendance. In the Spiral method, additional releases in the initial phases can be prototypes [15], while in subsequent iterations, they may evolve into a production-level technical system with more comprehensive versions [16]. Figure 1 illustrates that the Spiral method consists of six stages [9].



Source: (Research Results, 2024)

Figure 1. Spiral Method

The Customer Communication stage involves initial communication mapping with the client regarding the expected system development needs. During this stage, the system developers gather data as optimally as possible through observation, interviews, and literature reviews to align the perspectives on the client's system needs with the system developers. Once the client's requirements are in harmony with the system developer's perspective, the next stage is Planning. The planning phase involves conceptual mapping to achieve goals, starting from determining the system development timeline, required resources, to specifying the devices to be used [17].

Next is the Risk Analyst mapping before system development. The mapping of UML (Unified Modeling Language) in risk analysis involves interactions among actors in the system using Use Case Diagram tools [18]. UML is an object-based modeling language [19] that supports system development [20]. Following that, the Engineering stage involves system development using PHP (Hypertext Preprocessor) as the programming language, CodeIgniter as the system development framework, and MySQL as the database [21] [22]. PHP is defined as a programming language applied in system development [23]. CodeIgniter is defined as an open-source, MVC (Model View Controller) framework used in creating dynamic systems [24] using the PHP programming language in a complex and fast manner [25]. In this stage, if there are system updates from the client or error findings, maintenance will be performed on the system.

Once the system is developed, the Construction and Release stage follows. This stage involves designing user guides for the client through training or creating instructional books. Additionally, the system undergoes testing by the client with Black

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Box Testing to verify the functional system aligns with the client's expectations and needs [26]. The final stage is Customer Evaluation by the client regarding the system developed by the developers. The client provides feedback on the series of system development activities, the system installation process, and the system release.

RESULTS AND DISCUSSION

A. Customer Communication

The results of the data collection for employee performance assessment at Hasnur Centre using the 360° Assessment every quarter reveal several findings. Employees who assess other employees are referred to as reviewers, while employees being assessed are called reviewed. The reviewed individuals are evaluated by reviewers from various segments in a 360° manner within each unit. The performance assessment of employees includes 10 perspectives, and each perspective is further detailed into predetermined sub-perspectives by Hasnur Centre. These sub-perspectives serve as a reference for reviewers when assessing the reviewed using the rating scale method and brief description entries. The assessments from each reviewer are then accumulated to form the final assessment results for the reviewed, which are classified as shown in Table 1. The final classification results of the reviewed can only be viewed by the HR Admin and are subsequently used as a basis for decision-making by the Executive Director of Hasnur Centre regarding the performance of the employees.

Table 1. Classification of Accumulated Employee Performance Assessment at Hasnur Centre

No	Accumulation	Accumulated Classification
1	0-1	Requires Evaluation
2	1,1-2	Warning
3	2,1-3	Needs Improvement
4	3,1-4	Standard Performance
5	4,1-5	High Performance

Source: (Research Results, 2024)

B. Planning

The development of the Employee Performance Assessment Information System at Hasnur Centre utilizes the Spiral system development method for a duration of 3 months, from April 15, 2023, to July 15, 2023. Employee performance assessment employs the 360° Assessment method based on predetermined perspectives and sub-perspectives established each quarter. The system's needs are mapped using Use Case Diagram tools in the UML (Unified Modeling Language). The system development utilizes PHP (Hypertext Preprocessor) as the programming language, CodeIgniter as the system development framework, and MySQL as the database. Table 2 provides specifications for the minimum required system hardware.

Table 2. Minimum Required System Hardware Specifications

No.	Aspect	Minimum Specifications
1	OS	Windows 10
2	Browser	Chrome and Microsoft Edge
3	Processor	Intel Atom® N570
4	RAM	1 GB
5	Display	14 inch with a minimum resolution of 1024x 768

Source: (Research Results, 2024)

C. Risk Analyst

Based on communication mapping with the client and system development planning, the user actors of the Employee Performance Assessment Information System at Hasnur Centre can be identified. The Risk Analysis system development mapping utilizes the Use Case Diagram tools in the UML (Unified Modeling Language), identifying actors as shown in Table 3 below.

Table 3. Actor Identification

No.	Actor	Assignment of Actors
1	Admin	a. Users can Create, Read, Update, and Delete (CRUD) HR Admin account data b. Users can Create, Read, Update, and Delete (CRUD) the format of employee performance assessment data c. Users can Create, Read, Update, and Delete (CRUD) data on perspectives for employee performance assessment d. Users can Create, Read, Update, and Delete (CRUD) data on sub-perspectives for employee performance assessment
2	HR Admin	a. Users can Read HR Admin account data b. Users can Create, Read, Update, and Delete (CRUD) Employee account data c. Users can Create, Read, Update, and Delete (CRUD) data on employee performance assessment d. Users can Create, Read, Update, and Delete (CRUD) data on reviewers and reviewed e. Users can Create, Read, Update, and Delete (CRUD) data on the publication of employee performance assessment f. Users can Read data on employee performance assessment results
3	Employee	a. Users can Read Employee account data b. Users can Create, Read, Update, and Delete (CRUD) data on employee performance assessment

Source: (Research Results, 2024)

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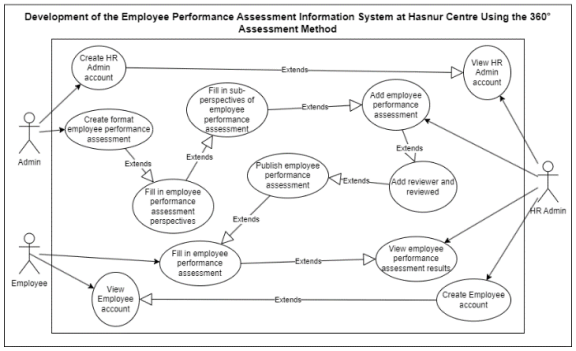
After identifying the actors, Figure 2 illustrates the design of the Use Case Diagram for the system.

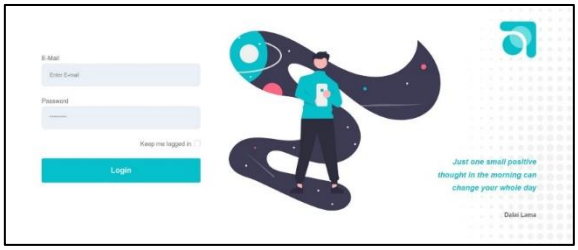


Source: (Research Results, 2024)

Figure 2. Use Case Diagram

D. Engineering

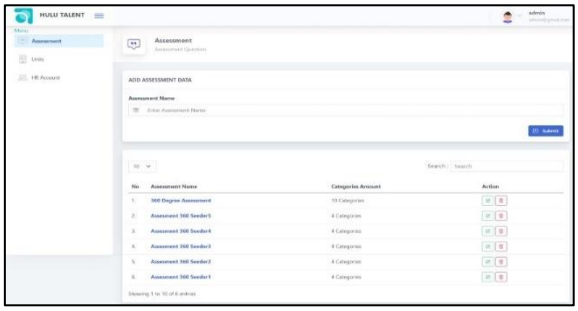
Figure 3 displays the user login page, encompassing input fields for the email and password of users registered as Admin, HR Admin, and Employee.



Source: (Research Results, 2024)

Figure 3. User Login Page Display

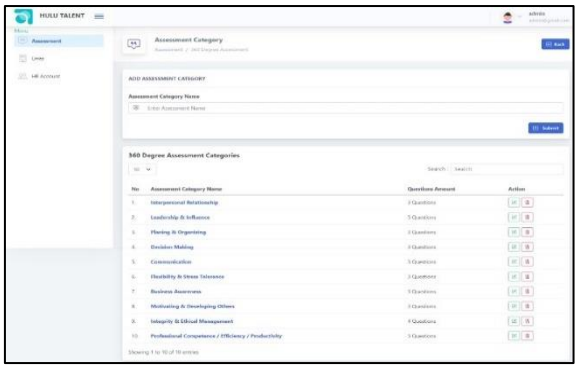
Figure 4 features the display for adding assessment data. This feature functions to add the assessment name by filling in the data in the Assessment Name and then clicking Submit. The assessment data includes 10 perspectives, further detailed into sub-perspectives predetermined by Hasnur Centre. On this page, you can also edit or delete assessment names.



Source: (Research Results, 2024)

Figure 4. Display for Adding Assessment Data

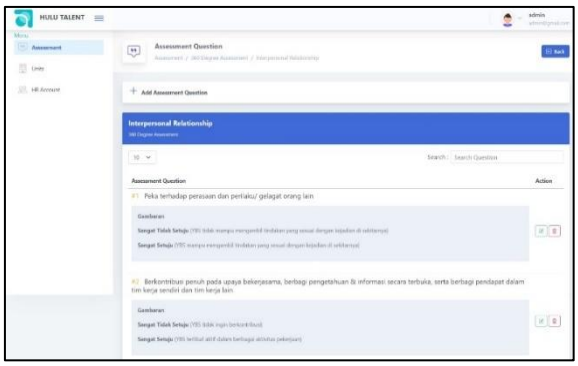
Figure 5 showcases the display for adding perspective assessment data. This feature functions to add the perspective name by filling in the data in the Assessment Category Name and then clicking Submit. Each perspective's data includes several sub-perspectives predetermined by Hasnur Centre. On this page, you can also edit or delete the perspective assessment names.



Source: (Research Results, 2024)

Figure 5. Display for Adding Perspectives Assessment Data

Figure 6 presents the display for adding sub-perspective assessment data. This feature functions to add the sub-perspective name by filling in the data in Add Assessment Question and then clicking Submit. The data for each sub-perspective is further detailed to provide a brief description according to the established criteria by Hasnur Centre. On this page, you can also edit or delete sub-perspective assessment names.



Source: (Research Results, 2024)

Figure 6. Display for Adding Sub-Perspective Assessment Data

Figure 7 contains the display of unit data available at Hasnur Centre, managed by the Admin. Admin can create, edit, or delete unit data. This unit serves to map employee data per unit for conducting employee performance assessments using the 360° Assessment method.

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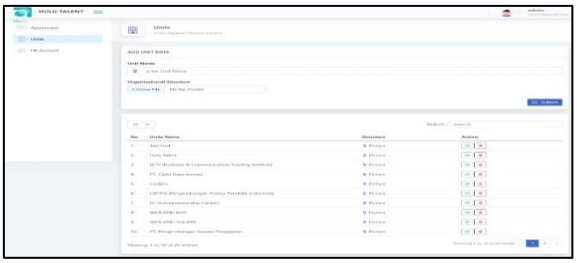
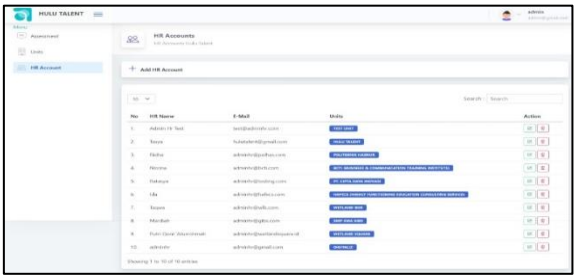


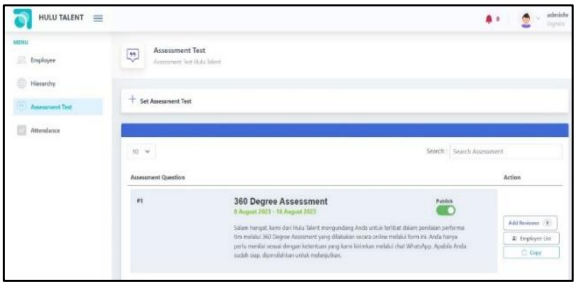
Source: (Research Results, 2024)
Figure 7. Display of Unit Data

Figure 8 consists of the display of HR Admin account data per unit, managed by the Admin. Admin can create, edit, or delete HR Admin accounts. Each unit will be managed by one HR Admin for conducting employee performance assessments in the unit using the 360° Assessment method.



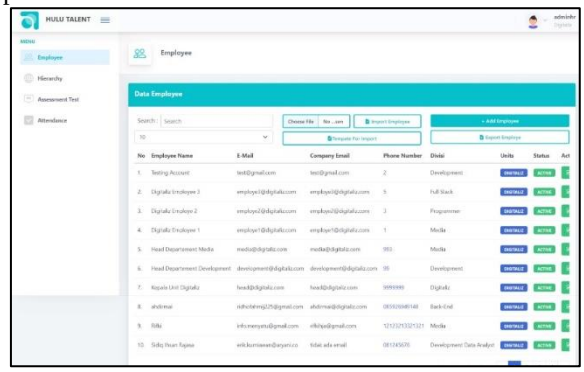
Source: (Research Results, 2024)
Figure 8. Display of HR Admin Account Data Per Unit

Figure 9 includes the display of employee performance assessment data managed by HR Admin. HR Admin can create, edit, or delete employee performance assessment data that has been organized by the Admin. On this page, there is a Publish feature that can activate or deactivate the performance assessment for employees to fill out later. There is also a Copy feature so that future employee performance assessments do not need to input data one by one. Furthermore, this feature can add, edit, or delete reviewer and reviewed data for each unit according to the 360° Assessment method mapped by the Admin account.



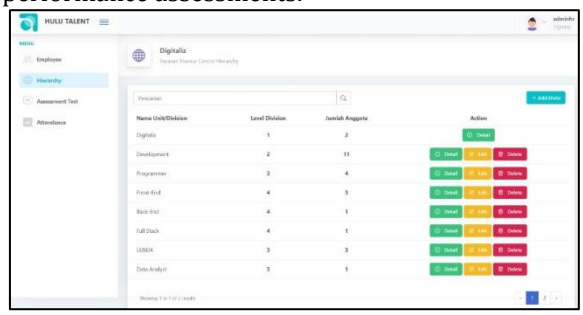
Source: (Research Results, 2024)
Figure 9. Display of Employee Performance Assessment Data in the HR Admin Account

Figure 10 displays the employee data for each unit on each HR Admin account. HR Admin can create, edit, or delete unit employee accounts according to their hierarchy, making it easier to assess employee performance.



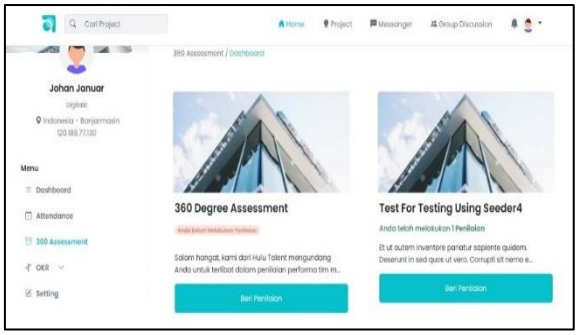
Source: (Research Results, 2024)
Figure 10. Display of Employee Data Per Unit

Figure 11 illustrates the mapping display of the hierarchy data per unit, integrated with employee data, making it easier to conduct employee performance assessments.



Source: (Research Results, 2024)
Figure 11. Display of Hierarchy Data Per Unit

Figure 12 features the display of active employee performance assessments on the employee account that can be filled out by the employee according to the established hierarchy using the 360° Assessment method. When an employee clicks the Give Assessment feature, the system will direct to the Figure 13 display.



Source: (Research Results, 2024)
Figure 12. Display of 360° Assessment Performance Evaluation on the Employee Account

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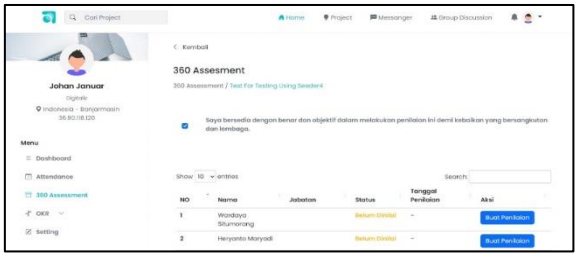
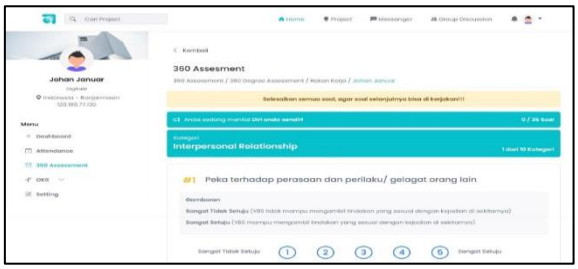
Figure 13 shows the list of employees who need to be assessed according to the established hierarchy using the 360° Assessment method. When an employee clicks the Create Assessment feature, the system will direct to the Figure 14 display.



Source: (Research Results, 2024)

Figure 13. Display of the List of Employee Who Need To Be Assessed

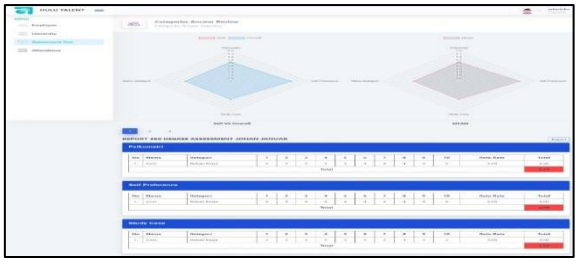
Figure 14 comprises the display of the employee performance assessment form with perspectives and sub-perspectives predetermined by Hasnur Centre. The assessment form includes objective assessments using a rating scale from one to five, and at the end of the session, there is a brief entry to describe the reviewer's reasons for giving that assessment to the reviewed.



Source: (Research Results, 2024)

Figure 14. Display of the Employee Performance Assessment Form

Figure 15 presents the display of the cumulative assessment results by reviewers for the reviewed, visible only to HR Admin to maintain the confidentiality of assessment data. The assessment results include a detailed cumulative report from the reviewers.



Source: (Research Results, 2024)

Figure 15. Display of Cumulative Employee Performance Assessment Results in the HR Admin Account

E. Construction and Release

After the system has been successfully developed, the next step is the design of user guidance for the client, either through training sessions or by creating user guidebooks for each Admin, HR Admin, and Employee account. Table 4 presents the results of user testing using Black Box Testing to verify the functionality of features in the system according to the client's expectations and requirements.

Table 4. System Testing Results Using Black Box Testing Method

No.	User	System Testing Results
1	Admin	a. Users successfully Create, Read, Update, and Delete (CRUD) HR Admin account data b. Users successfully Create, Read, Update, and Delete (CRUD) the format of employee performance assessment data c. Users successfully Create, Read, Update, and Delete (CRUD) data on perspectives for employee performance assessment d. Users successfully Create, Read, Update, and Delete (CRUD) data on sub-perspectives for employee performance assessment
2	HR Admin	a. Users successfully Read HR Admin account data b. Users successfully Create, Read, Update, and Delete (CRUD) Employee account data c. Users successfully Create, Read, Update, and Delete (CRUD) data on employee performance assessment d. Users successfully Create, Read, Update, and Delete (CRUD) data on reviewers and reviewed e. Users successfully Create, Read, Update, and Delete (CRUD) data on the publication of employee performance assessment f. Users successfully Read data on employee performance assessment results
3	Employee	a. Users successfully Read Employee account data b. Users successfully Create, Read, Update, and Delete (CRUD) data on employee performance assessment

Source: (Research Results, 2024)

CONCLUSION

This research has resulted in the Employee Performance Assessment Information System at Hasnur Centre employees, introducing a novelty by integrating the 360° Assessment method based on predetermined perspectives and sub-perspectives using a Likert Scale. This is complemented by a brief fill-in-the-blank approach that allows evaluators to provide qualitative feedback on the employees being assessed. As a result, employee performance

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assessments are now measurable, objective, and unbiased. This system enables HR Admin to automatically compile quarterly online employee performance assessment forms structured according to the predefined performance perspectives and sub-perspectives. Employees can also complete assessments that are automatically structured with a performance hierarchy. Additionally, HR Admin can automatically generate reports and access comprehensive employee performance data in real time. By combining both quantitative and qualitative data, the system effectively answers the research hypothesis by enabling a clear and structured measurement of employee performance levels. It provides a detailed, data-driven overview of employee achievements and areas for improvement, thus supporting informed decision-making by the Executive Director of Hasnur Centre regarding performance appraisals, talent development, and strategic HR planning.

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