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Development of a Web-Based E-Report Visualization Dashboard Evaluated Using the System Usability Scale (SUS)

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ABSTRACT

Student report card data management at the Ulil Albab Foundation in Batam is currently handled manually using Microsoft Excel. This approach is highly inefficient, as it is prone to input errors, hinders real-time data monitoring, and fails to present academic information in a visual and structured manner. Although previous research developed a web-based e-Report (Electronic Report) system, its focus remained limited to structured grade processing and storage. It lacked an optimal, interactive, and user-friendly dashboard for presenting information. To address these gaps, this study aims to design and build a web-based e-Report system equipped with a data visualization dashboard to support more effective, efficient, and well-documented management of student academic data. The issues addressed in this study fall into the category of broadly defined academic management problems, which impact teacher workflow efficiency, information transparency for parents, and the principal's capacity to monitor overall institutional academic performance. The system incorporates data visualization implemented via the Recharts library, generating interactive Bar Chart, Radar Chart, and Line Chart components. The expected outcome of this research is a web-based e-Report platform that simplifies grade inputting for teachers, provides streamlined report card access for students and parents, and delivers a real-time academic data visualization dashboard to assist school administrators in decision-making. The system evaluation conducted through the System Usability Scale (SUS) involving ten respondents yielded a final average SUS score of 79.50 out of 100, placing the system within the "Good" category according to the adjective rating classification confirming that end-users perceived the system as sufficiently intuitive, functionally coherent, and practically adoptable for routine academic data management tasks.

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1. INTRODUCTION

Education is a fundamental element in human development, not merely a vehicle for transmitting knowledge, but also a crucial instrument in shaping one's character, behavior, and identity[1][2]. Through education, individuals are shaped into individuals with advanced thinking skills, outstanding performance, and noble morals as a foundation for interacting within their social environment[3]. Education is not only defined as a process of transferring knowledge and skills, but also as a process of individual humanization, encompassing the instillation of values, culture, and the formation of a holistic moral character[4]. This concept aligns with previous research, which shows that education should humanize humans holistically through the development of intellectual, moral, and social aspects.

In line with contemporary educational orientations, the availability of an evaluation system capable of comprehensively measuring learning achievement, both in terms of reasoning and character development,

is a necessity that cannot be ignored. Evaluation plays a strategic role in education, as the data it produces serves as a benchmark for assessing the quality of the teaching and learning process and as a basis for designing quality improvement measures at the school level[5][6]. To align with modern educational standards, Indonesia has adopted an independent curriculum that prioritizes flexible, student-centered learning designed to maximize individual potential[7]. In tandem with this curricular shift, the national evaluation system was overhauled in 2022 when the Ministry of Education, Culture, Research, and Technology introduced educational report cards. This new assessment tool measures institutional quality by evaluating student performance in literacy, numeracy, and character development, while also assessing the overall quality of the learning environment.

Despite their intended benefits, educational report cards face critical implementation challenges, primarily due to dense and highly technical data presentation[8]. Because the system tracks a massive web of multidimensional indicators and sub-indicators across literacy, numeracy, character, and the learning environment, many schools struggle to interpret their evaluation results quickly or accurately. This complexity ultimately hinders school leaders from using the data effectively for strategic planning and quality improvement[9]. To overcome these barriers and optimize data utilization, schools require integrated academic management systems that streamline information. Implementing a web-based e-Report system offers a practical solution, simplifying grade entry while serving as an accessible, centralized hub for actionable educational evaluation data.

This gap becomes even more apparent when looking at the current success of other educational information systems, particularly web-based e-Reports. Numerous studies show that these systems are already being successfully deployed using reliable technologies like PHP and MySQL. Developed through structured using scrum method, these platforms operate effectively to streamline grade management, boost administrative efficiency, and provide tailored access for administrators, teachers, homeroom teachers, and students. Additionally, web-based e-Reports enhance data transparency and offer real-time updates, which significantly improves communication between schools, students, and parents as they monitor academic progress.

However, these studies still reveal several limitations, particularly in terms of data visualization and ease of interpretation of the information presented. Most e-Report systems still focus on processing and storing grade data in a structured manner, but are not yet optimal in presenting information in the form of interactive and easy-to-understand dashboards to support rapid analysis by schools. Furthermore, limited system development flexibility and the lack of adaptive development approaches, such as agile methods, also pose challenges in developing more dynamic systems. This gap is the core of the problem on the one hand, there is a need for fast, simple, and easy to understand presentation of Educational Report data, but on the other hand, existing systems are not yet able to optimally meet these needs.

Given this gap, the solution needed is not simply improving existing data processing mechanisms, but rather developing new approaches to presenting information that are more innovative and communicative. In this case, dashboard-based data visualization is a relevant solution. According to several studies, web-based analytical dashboards can present data in the form of graphs, diagrams, and visual indicators, making it easier for users to understand information quickly and accurately[10]. Furthermore, dashboards also enable real-time data monitoring, allowing users to see trends, patterns, and changes in data immediately.

The integration of a data visualization dashboard represents a transformative step in how educational institutions handle and interpret complex datasets. By converting raw, multidimensional data into intuitive and visually compelling displays, such systems fundamentally redefine the analytical workflow within schools. Rather than spending considerable time and effort deciphering spreadsheets or navigating disconnected data sources, administrators and educators can engage directly with clear, interactive visual representations that surface meaningful patterns and trends at a glance. This shift does not merely accelerate the pace of data analysis it fundamentally elevates the quality of decision-making by empowering school stakeholders to monitor student progress in real time and formulate faster, more precise, and more evidence-based strategic responses.

This nationwide push for comprehensive, technology-driven evaluation ultimately translates into direct administrative burdens at the school level, particularly for institutions operating under foundations that oversee multiple schools simultaneously. Each school is required to compile and submit data for the national education report card in accordance with indicators set by the Ministry, while simultaneously managing its own internal reporting of student grades and academic progress. For foundations responsible for several schools at once, this dual reporting obligation one directed upward to meet national standards, the other directed inward to sustain daily academic management creates a compounding administrative load, especially when the underlying data infrastructure remains manual and fragmented.

The urgency for such a solution is particularly pronounced at the Ulil Albab Foundation in Batam, where the management of student report card data continues to rely entirely on manual processes carried out through Microsoft Excel. While spreadsheet tools offer basic functionality, this traditional approach has

revealed significant and compounding limitations in an educational environment that demands accuracy, efficiency, and accessibility. The manual system is inherently susceptible to human error, whether through data entry mistakes, formula inconsistencies, or version control issues that arise when multiple staff members handle the same files. Furthermore, data managed in this way tends to become siloed fragmented across individual files or departments with no unified, centralized structure making cross-referencing and holistic analysis unnecessarily burdensome. Real-time monitoring of student academic performance becomes practically impossible under such conditions, leaving administrators unable to respond promptly to emerging concerns. Perhaps most critically, the absence of any structured visual format for presenting academic insights means that the full informational value embedded within the data remains largely inaccessible to those who need it most.

It is in direct response to these challenges that this research undertakes the development of a web-based Electronic Report Card Information System commonly referred to as e-Report equipped with a fully integrated data visualization dashboard, purpose-built to meet the specific needs and operational context of the Ulil Albab Foundation in Batam.

2. RESEARCH METHOD

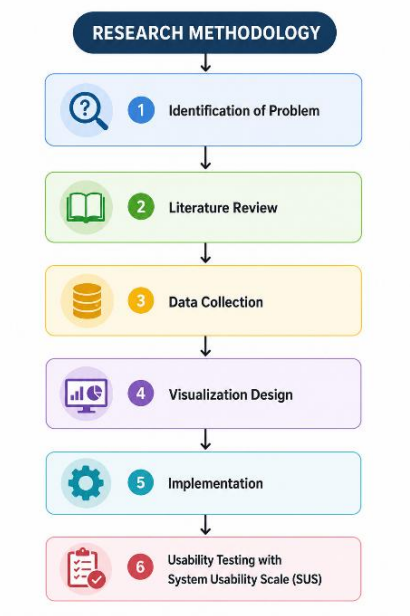

Figure 1. Research Metodology

2.1 Identification Problem

The primary problem identified in this research is the inefficiency of the current student report card management system at the Ulil Albab Foundation in Batam, which still relies on manual data processing through Microsoft Excel. This conventional approach generates a range of critical operational issues, including high susceptibility to human error, fragmented data storage that prevents centralized access, limited capacity for real-time academic monitoring, and the absence of a structured visual format for presenting student performance data. As a result, school administrators and educators face significant difficulties in conducting rapid, accurate analysis of student learning outcomes, ultimately impeding evidence-based decision-making for institutional quality improvement.

The secondary problem lies in the broader limitation of existing e-Report systems, which, while capable of streamlining grade entry and administrative workflows, remain suboptimal in terms of data visualization and interpretability. Most currently deployed systems are designed primarily for data storage and processing, without incorporating interactive dashboards that can transform complex, multidimensional educational data spanning literacy, numeracy, character, and learning environment indicators into clear and actionable visual insights. This deficiency is particularly critical in the context of Indonesia's independent curriculum reform and the national educational report card system introduced in 2022, both of which demand that school leaders engage with layered evaluation data swiftly and strategically. Consequently, there is an urgent need to develop a web-based e-Report Card Information System integrated with a data visualization dashboard that bridges this gap between data complexity and practical usability.

2.2 Literature Review

Several prior studies have examined the development of web-based academic information systems and data visualization dashboards within educational contexts, providing a foundational basis for this research[11]. Web-based e-Report systems built using PHP and MySQL frameworks effectively streamline grade management processes and improve administrative efficiency across multiple user roles, including administrators, teachers, and students[12]. In the domain of data visualization, dashboards integrated into educational platforms significantly enhance data readability, enabling school stakeholders to interpret complex performance indicators more rapidly and accurately[13]. Furthermore, the viability and the necessity of highlighted that real-time dashboard monitoring systems support more agile and responsive institutional decision-making, particularly when handling multidimensional evaluation data such as those produced by Indonesia's national educational report card framework[14]. Combining e-Report functionality with interactive visualization capabilities a gap that existing systems have yet to fully address and that this research seeks to resolve through the development of an integrated web-based e-Report Card Information System for the Ulil Albab Foundation in Batam.

2.3 Data Collection

The data collection process in this research employed multiple techniques to ensure comprehensive and accurate information gathering in support of system development. Primary data was obtained through direct observation conducted at the Ulil Albab Foundation in Batam, where the researcher examined the existing manual report card management workflow performed via Microsoft Excel, identifying operational bottlenecks, data fragmentation patterns, and user pain points firsthand. In addition, structured interviews were conducted with key stakeholders, including school administrators, homeroom teachers, and subject teachers, to capture their practical needs, expectations, and challenges regarding the current system. Supplementary primary data was also gathered through questionnaires distributed to system end-users, subsequently evaluated using the System Usability Scale (SUS). Secondary data was collected through documentary study, involving the review of existing student grade records, academic reporting templates, and institutional data management procedures at the foundation. Together, these data collection methods provided a holistic empirical foundation, ensuring that the system developed in this research is both technically sound and contextually aligned with the real operational needs of the Ulil Albab Foundation.

Table 1. Research Data Sample

NISN	Test Score							
	PAI	PP	BIN	IPAS	SB	MTK	PJOK	B.ARAB
3169406***	75	75	75	75	80	75	88	30
3161177***	83	80	75	75	80	75	88	64
3163543***	83	88	82	75	90	75	87	54
3168790***	83	75	75	75	90	75	87	50
3164900***	98	88	84	83	80	94	87	74
3164226***	75	95	82	91	80	75	87	62
3158680***	53	75	75	75	95	75	87	32
3140703***	90	75	92	75	75	75	88	38
0145663***	83	93	89	91	90	89	87	54
3153246***	98	80	76	80	80	75	87	70

Table 1 presented a sample of student assessment data from Yayasan Ulil Albab Senior High School. The dataset includes each student's National Student Identification Number (NISN), presented in partially masked form for privacy, along with their test scores across eight subjects: Islamic Religious Education (PAI), Pancasila Education (PP), Indonesian Language (BIN), Natural and Social Sciences (IPAS), Arts and Culture (SB), Mathematics (MTK), Physical Education and Sports (PJOK), and Arabic Language (B. ARAB).

The sample consists of ten students, with scores ranging from a low of 30 (Arabic Language) to a high of 98 (PAI and MTK). Most subjects show relatively consistent performance among students, with scores clustering between 75 and 95, reflecting a generally strong grasp of core and religious/cultural subjects. In contrast, Arabic Language scores show a notably wider spread, ranging from as low as 30 to as high as 74, suggesting greater variability in student proficiency for this subject compared to the others.

This variability in student performance, particularly the wide disparity observed in Arabic Language scores, underscores the importance of developing an e-report visualization system. Manually reviewing raw score tables across multiple subjects and teachers makes it difficult to detect performance gaps or monitor how well each teacher's subject achievement targets are being met. A visualization-based e-report system would allow school principal to monitor subject-level achievement from each subject more effectively, quickly

identify subjects or classes that require additional attention, and support more timely, data-driven decision-making in the teaching and learning process.

2.3 Visualization Design

This study utilizes data visualization as a core analytical method because of its ability to transform raw numerical data into intuitive graphical formats such as diagrams, charts, or maps making information significantly easier to interpret. Broadly defined as the use of visual representations to explore, interpret, and communicate data, this approach serves as both a vital instrument for analysis and a powerful tool for presenting discovered insights to stakeholders[15].

The visualization design phase constitutes a critical step in translating the identified system requirements into concrete, structured interface blueprints prior to full-scale development. In this research, the design process was initiated through the construction of wireframes, which serve as low-fidelity skeletal representations of the system's core pages and functional components. Wireframes were developed for four primary interface modules include the Login Page, the Principal Dashboard, the Grade Input Page for Teacher, and the Report Visualization Page. The Login Page wireframe outlines a minimalist authentication layout comprising institutional identity elements, username and password input fields, and a single submission control. The Administrator Dashboard wireframe presents a multi-panel layout incorporating a navigation sidebar, summary statistic cards displaying key academic indicators such as average scores, student counts, and completion rates, alongside embedded chart containers designated for bar graphs and line charts representing class-level and subject-level performance trends. The Grade Input Page wireframe structures a tabular data entry form organized by subject, student name, and assessment component columns, designed to minimize input friction and reduce human error. Finally, the Report Visualization Page wireframe maps an interactive dashboard layout featuring filterable chart panels for literacy, numeracy, and character indicators, enabling school stakeholders to conduct rapid comparative analysis across academic periods.

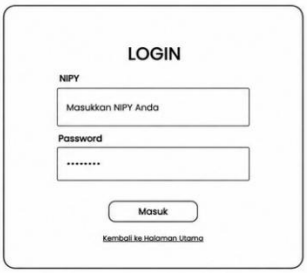

Figure 2. Login page design

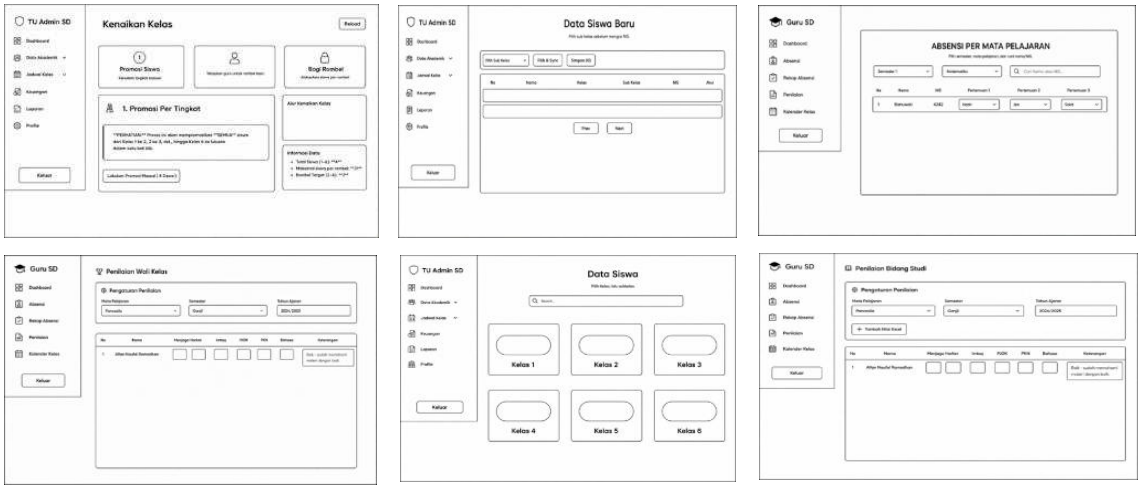

Figure 3. Wireframe Design

2.4 Implementation

By translating complex datasets into visual assets, users can quickly identify underlying patterns, trends, and correlations that would otherwise remain hidden, thereby accelerating informed decision-making and problem-solving[16]. This is further supported the research who note that data analysis achieves maximum

clarity and effectiveness when paired with graphical or tabular visualization, as these elements work together to deliver a comprehensive understanding of the data[17].

In this research, data visualization was implemented using the Recharts library integrated with the React framework on the frontend of the system. Recharts is a React-based data visualization library that utilizes SVG to produce responsive, interactive, and easily customizable charts to suit display needs. There are three main types of visualizations used in the e-Report system dashboard. First, a Bar Chart is used to display a side-by-side comparison of average grades between grade levels, allowing the principal to easily identify classes with the highest and lowest academic performance. Second, a Radar Chart is used to compare average achievement in each assessment component include Daily Tests, Mid-Semester Assessments, and Final Semester Assessments. This visualization helps identify aspects of the assessment that reflect students overall strengths and weaknesses. Third, a Line Chart is used to display the development trend of average academic grades over time, based on the academic year and semester. In this way, the principal can periodically evaluate the progress of learning outcomes and the effectiveness of educational programs.

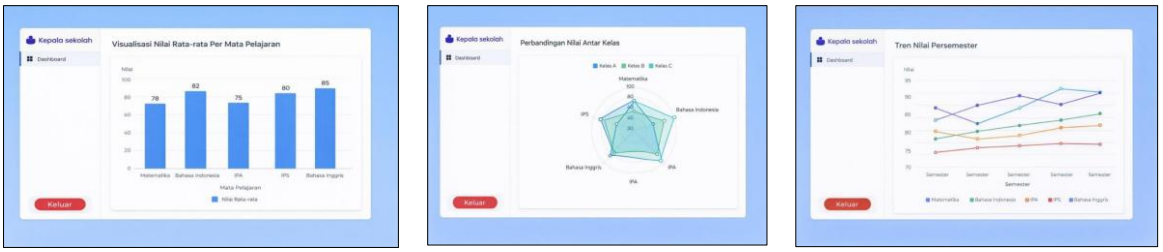

Figure 4. Chart Design

3. RESULTS AND ANALYSIS

The web-based e-Report Card Information System developed in this research was built upon a modern and robust technology stack carefully selected to ensure system reliability, scalability, and maintainability throughout its operational lifecycle. On the frontend layer, the system was constructed using React, a component-based JavaScript library widely adopted in contemporary web application development for its capacity to deliver dynamic, responsive, and highly interactive user interfaces. The backend layer was developed using Laravel, a PHP-based web application framework renowned for its elegant syntax, comprehensive built-in features, and strong support for RESTful API architecture, which serves as the core engine managing all server-side logic, data processing, authentication, and communication between the frontend interface and the database layer.

3.1. Login and Logout Page

Figure 5. Login and Logout Page

3.2. Dashboard and User Profile

All users can access the dashboard and profile page according to their respective roles. The principal's dashboard is equipped with data visualization components in the form of a bar chart comparing average grades between classes, a radar chart comparing grades between classes, and a line chart showing average grade development, all built using the Recharts library. Furthermore, the dashboard also displays an Analytics Insight Layer that automatically calculates the overall average for all classes, the highest-performing class, and grade disparities. The statcard component displays a summary of the number of active students, teaching staff, study groups, and daily attendance percentage, complete with trend indicators.

Figure 5. Dashboard and User Profile

3.3. User Management and Academic Data

Super Admins can fully manage user accounts, including adding, editing, deactivating, and deleting accounts. School Admins can manage the academic year, view teacher data, add new students, manage classes and study groups, manage class promotions, student placement, appoint homeroom teachers, transfer students, create class schedules, and view year-to-year student report card summaries. All data management features include input validation to prevent data errors.

Figure 6. User Management and Academic Data

3.4. Teacher Features: Assessment, Attendance, and Report Cards

Teachers can input intracurricular, co-curricular, and extracurricular assessments. In the system, the Homeroom Teacher and Subject Teacher roles are integrated into a single access right (role) and user interface called "Teacher." This is designed because a Homeroom Teacher at the Ulil Albab Foundation in Batam also acts as a subject teacher. Therefore, the subject assessment feature as a subject teacher can be accessed directly by users through the "My Subjects" menu within the same dashboard without having to switch accounts. Teachers can also record student attendance per lesson, display a summary of absences by class and semester, view class schedules and personal schedules, generate student report cards and submit final grades for verification by the Principal. The system automatically calculates final grades based on preconfigured weighting, minimizing the potential for manual calculation errors.

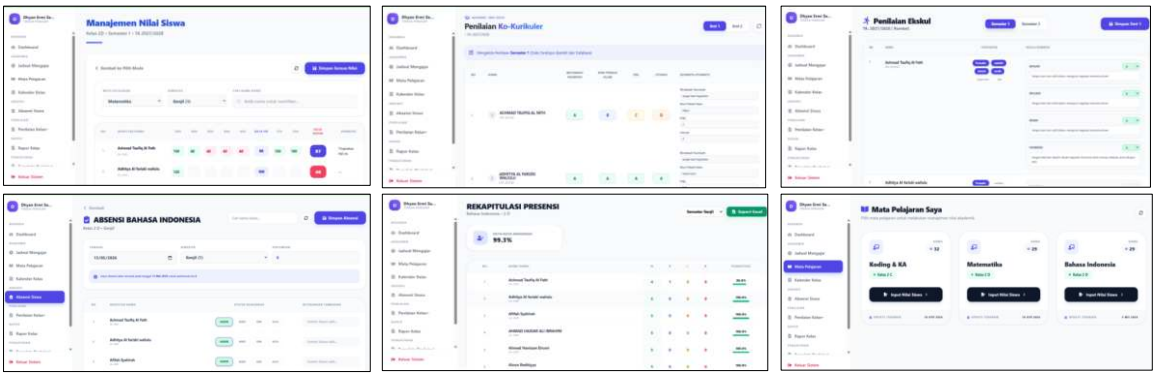

Figure 7. Teacher Features

3.5. Student Features: Assessment, Attendance, and Report Card Downloads

Students can access the system to view teacher assessment results for all subjects, view attendance summaries, and view a list of subjects taken. A key feature for students is the ability to download report cards in PDF format, which are automatically generated by the system based on verified grades. The generated PDF report card includes student identity, grades for all assessment components, homeroom teacher notes, and the principal's digital signature.

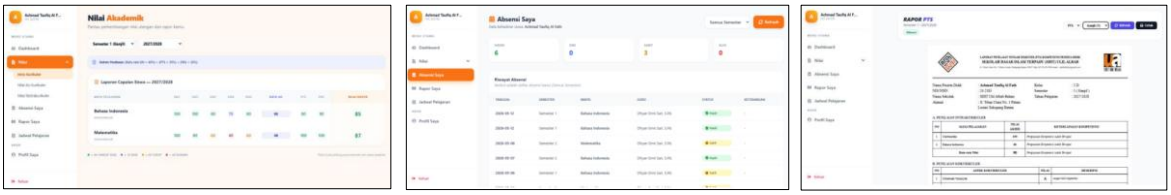

Figure 8. Student Features and Report Card Downloads

3.6. Principal Features: Monitoring and Validation

The Principal can monitor the progress of all teachers grade entry through a real-time monitoring dashboard. The dashboard displays the percentage of grade input completion per teacher and per class, making it easier to identify teachers who have not yet completed their grade entry. Furthermore, the Principal can view a summary of grades and average student learning outcomes and validate or approve final grades before report cards are issued to students. The validation feature also provides notifications to teachers if any grades need to be corrected.

Figure 9. Principal Features

3.7. Evaluation & Testing

Upon the successful completion of all implementation procedures, the system's main features were verified to be fully functional and accessible, confirming that the development and deployment process was executed correctly and that the system is operationally ready for the subsequent evaluation. System evaluation in this research was conducted using the System Usability Scale (SUS), a well-established and widely validated usability assessment instrument originally developed by John Brooke in 1986. SUS operates as a ten-item Likert-scale questionnaire, with each item rated on a five-point response scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), alternating between positively and negatively worded statements to mitigate response bias. The ten SUS items collectively assess two core usability dimensions: usability (covering learnability, efficiency, and error management) and learnability (reflecting how easily new users can achieve proficiency with the system). To compute the SUS score, responses to odd-numbered items (positive statements) are scored by subtracting 1 from the raw response value, while responses to even-numbered items (negative statements) are scored by subtracting the raw response value from 5. The sum of all converted scores is then multiplied by 2.5 to yield a final SUS score on a scale of 0 to 100. In this research, the SUS questionnaire was distributed to a purposively selected group of respondents comprising school administrators, homeroom teachers, and subject teachers at the Ulil Albab Foundation in Batam, all of whom directly interacted with the developed e-Report Card Information System during the testing phase.

The resulting SUS scores were interpreted against adjective rating scale, wherein a score of ≥ 85.1 is classified as Excellent, 71.1–85.0 as Good, 57.1–71.0 as OK, 51.1–57.0 as Poor, and ≤ 51.0 as Awful. This evaluation framework ensures that the system's usability is assessed not merely from a technical functionality standpoint, but from the perspective of real end-users, thereby providing empirically grounded evidence of the system's practical effectiveness and readiness for institutional deployment.

Table 2. SUS Question

Number	Statement
1	I would like to use this e-Rapor system on a regular basis
2	I found this system unnecessarily complex
3	I thought the system was easy to use
4	I think that I would need assistance from others to be able to use this system
5	I found the various features in this system were well integrated
6	I thought there was too much inconsistency in this system
7	I would imagine that most people would learn to use this system very quickly
8	I found the system very cumbersome to use
9	I felt very confident using the system
10	I needed to learn a lot of things before I could get going with this system

The SUS score was calculated based on responses collected from ten respondents at the Ulil Albab Foundation in Batam. Each respondent answered ten statements using a five-point Likert scale. The scoring procedure strictly follows the standard SUS calculation method wherein odd-numbered items (1, 3, 5, 7, 9) represent positive statements and even-numbered items (2, 4, 6, 8, 10) represent negative statements. For each respondent, the contribution score of each item is derived using the following conversion rules.

For odd numbered items (positive),

$$Score = x - 1$$

where x is the respondent's raw rating and for even numbered items (negative),

$$Score = 5 - x$$

where x is the respondent's raw rating.

The sum of 10 respondents converted item scores per respondent is then multiplied by 2.5 to produce an individual SUS score on a scale of 0 to 100, expressed as:

$$\bar{x} = \frac{\sum x}{n}$$

where n represents the total number of respondents.

Table 3. SUS Score

Respondent	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
R1	5	1	5	2	5	1	4	1	4	4
R2	4	1	4	2	4	1	4	2	4	3
R3	5	2	5	1	5	1	4	1	5	4
R4	4	1	4	3	4	2	3	2	4	4
R5	5	1	5	2	5	1	4	1	4	4
R6	4	2	4	2	4	1	4	2	3	3
R7	5	1	5	1	5	1	4	1	5	4
R8	4	1	4	2	4	2	3	2	4	4
R9	5	2	5	2	5	1	4	1	4	3
R10	4	1	4	2	4	1	4	2	4	4

The System Usability Scale (SUS) evaluation was administered to ten respondents comprising school administrators, homeroom teachers, and subject teachers at the Ulil Albab Foundation in Batam, each of whom directly interacted with the developed web-based e-Report Card Information System during the user testing phase. Each respondent completed a ten-item questionnaire using a five-point Likert scale, with responses subsequently converted and aggregated following the standard SUS scoring procedure.

Table 4. Converted Score

Respondent	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Sum	SUS
R1	5	1	5	2	5	1	4	1	4	4	34	85.00
R2	4	1	4	2	4	1	4	2	4	3	31	77.50
R3	5	2	5	1	5	1	4	1	5	4	35	87.50
R4	4	1	4	3	4	2	3	2	4	4	27	67.50
R5	5	1	5	2	5	1	4	1	4	4	34	85.00
R6	4	2	4	2	4	1	4	2	3	3	29	72.50
R7	5	1	5	1	5	1	4	1	5	4	36	90.00
R8	4	1	4	2	4	2	3	2	4	4	28	70.00
R9	5	2	5	2	5	1	4	1	4	3	34	85.00
R10	4	1	4	2	4	1	4	2	4	4	30	75.00
				Total							**318**	**795.00**

The final SUS score for the system is obtained by computing the mean of all individual respondent scores:

$$\sum x = \frac{85.00 + 77.50 + 87.50 + 67.50 + 85.00 + 72.50 + 90.00 + 70.00 + 85.00 + 75.00}{10}$$

$$= \frac{795.00}{10}$$

$$= 79.50$$

Examining the individual SUS scores across 10 respondents reveals a generally favorable level of perceived usability throughout the evaluation. The majority of respondents recorded scores ranging from 67.50 to 90.00, indicating that most users found the system accessible, well-integrated, and relatively straightforward to navigate during the testing phase. Several respondents awarded higher scores reflecting strong agreement that the system was easy to use and did not require excessive external assistance, while a smaller subset provided moderate scores suggesting minor areas of improvement, particularly regarding the need for initial guidance and prior familiarization with certain system features.

The sum of 10 individual SUS scores totaled 795.00, yielding a final average SUS score of 79.50 out of 100. Interpreted against the adjective rating classification proposed by Bangor et al[18], a score of 79.50 places the system within the "Good" category, defined as scores ranging from 71.1 to 85.0. This result signifies that the developed e-Report Card Information System achieved a commendable level of usability, wherein end-users found the system sufficiently intuitive, functionally coherent, and practically adoptable for daily academic data management tasks. While the system did not reach the Excellent threshold, the Good classification nonetheless confirms that the system meaningfully addresses the usability limitations of conventional manual report card management and existing e-Rapor platforms, and demonstrates strong readiness for institutional deployment at the Ulil Albab Foundation in Batam. Further refinement based on respondent feedback, particularly in areas of learnability and initial onboarding, is recommended to elevate the system toward an Excellent usability rating in future development iterations.

4. CONCLUSION

This research successfully developed a web-based e-Report Card Information System integrated with a data visualization dashboard for the Ulil Albab Foundation in Batam. The system was built to resolve critical inefficiencies in the foundation's existing manual academic data management process and to bridge the gap between complex educational evaluation data and practical, accessible information presentation for school stakeholders. Based on the development process and evaluation results conducted throughout this study, the following conclusions are drawn:

1. The web-based e-Report Card Information System was successfully developed using a structured development methodology, providing school administrators, homeroom teachers, and subject teachers with a centralized, accessible, and real-time academic data management platform that effectively replaces the previous manual Excel-based process, thereby eliminating data fragmentation, reducing human error, and improving overall administrative efficiency at the Ulil Albab Foundation in Batam.
2. The integration of an interactive data visualization dashboard within the system successfully transforms complex, multidimensional educational evaluation data encompassing student grades, literacy, numeracy, and character indicators into clear, intuitive, and visually communicative displays, enabling school stakeholders to conduct rapid data interpretation and make more informed, evidence-based strategic decisions in alignment with Indonesia's national independent curriculum framework and the Ministry of Education's educational report card evaluation system.
3. The system evaluation conducted through the System Usability Scale (SUS) involving ten respondents yielded a final average SUS score of 79.50 out of 100, placing the system within the "Good" category according to the adjective rating classification confirming that end-users perceived the system as sufficiently intuitive, functionally coherent, and practically adoptable for routine academic data management tasks without requiring extensive prior technical training or external assistance.
4. Despite achieving a Good usability testing, the evaluation results identified remaining areas for improvement, particularly in the aspects of initial user onboarding and learnability for non-technical users, indicating that further interface refinement and feature enhancement are necessary to elevate the system's usability toward the Excellent threshold in future development iterations.

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