ISSN: 2582-7219

International Journal of Multidisciplinary Research in Science, Engineering and Technology

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

Impact Factor: 8.206

Volume 9, Issue 1, January 2026

© 2026 IJMRSET | Volume 9, Issue 1, January 2026| DOI:10.15680/IJMRSET.2026.0901005

ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 8.206| ESTD Year: 2018|

International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

OJTrack: Android and Web-Based OJT Monitoring and Attendance System

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ABSTRACT: This paper presents OJTrack, an Android and web-based system designed to modernize On-the-Job Training (OJT) monitoring for Bachelor of Science in Information Technology students at North Eastern Mindanao State University, Cantilan Campus. The system integrates QR code attendance logging, OTP verification, and AI-assisted report generation to improve accuracy, efficiency, and reliability. Evaluation based on the ISO/IEC 25010 quality model revealed high ratings in functionality, usability, performance, reliability, and security, demonstrating that OJTrack is a secure and user-friendly platform for efficient OJT tracking and documentation.

KEYWORDS: OJT Monitoring, QR Code Attendance, Artificial Intelligence, Web-Based System, ISO/IEC 25010

I. INTRODCUTION

Internship programs serve as a crucial bridge between theoretical instruction and practical application in higher education, particularly for students pursuing degrees in Information Technology. At North Eastern Mindanao State University - Cantilan Campus, the On-the- Job Training (OJT) program provides students the opportunity to demonstrate technical competency in real industry environments. However, the university still relies heavily on manual recording and verification processes such as handwritten attendance sheets, paper-based daily reports, and in-person supervisor sign-offs. These methods often result in delays, data inconsistencies, and difficulty in monitoring trainee progress across multiple partner companies.

To address these recurring inefficiencies, this study developed OJTrack, an Android and web-based OJT Monitoring and Attendance System designed to digitalize record- keeping, automate attendance validation, and generate intelligent accomplishment reports. Through this system, trainees can log attendance via unique QR codes, supervisors can confirm records through One-Time Password (OTP) verification, and coordinators can review comprehensive digital reports in real time. By integrating these technologies, OJTrack streamlines the entire internship supervision process from attendance tracking to performance evaluation while ensuring transparency and data integrity. Earlier research underscores that technology-driven monitoring systems are vital for improving administrative efficiency and accountability in academic programs. Studies on mobile and web-based monitoring applications highlight significant reductions in processing time and improved coordination between supervisors and administrators [1][2]. Furthermore, automated documentation enhances information reliability and minimizes human error [3]. These findings substantiate the importance of transforming manual OJT processes into dynamic, responsive digital platforms.

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Despite prior institutional initiatives, OJT monitoring at NEMSU-Cantilan continues to depend on multiple physical documents that are cumbersome to handle, especially when verifying attendance and computing completion hours. Paper logs are susceptible to loss, damage, or late submission, while supervisor validation is constrained by time and geographic distance. To overcome these challenges, OJTrack employs integrated mobile-web architecture and AI-assisted reporting to create a unified, data-driven platform that benefits trainees, coordinators, and partner institutions alike.

Ultimately, this study aims to demonstrate that digital transformation through OJTrack can improve monitoring accuracy, enhance accountability, and reduce administrative workload. By adopting modern technologies aligned with international software quality standards, OJTrack provides a scalable framework for future academic monitoring systems within and beyond NEMSU. The project contributes not only to institutional digitalization but also to the broader goal of leveraging technology for efficient educational management.

II. REVIEW OF LITERATURE

The successful implementation of internship monitoring systems depends on the effective integration of digital tools that promote transparency, accessibility, and efficiency in managing student performance data. Within educational institutions, traditional methods of monitoring On-the-Job Training (OJT) activities still rely on manual encoding, physical logs, and paper-based reporting, which limit data reliability and delay administrative processing. Researchers and system developers have emphasized that transforming these manual approaches into automated digital workflows significantly improves productivity, accuracy, and communication between students, supervisors, and coordinators. In this context, the present study reviews existing research on web-based monitoring systems, QR attendance mechanisms, AI-driven documentation, and standard evaluation models to establish theoretical and empirical foundations for the development of **OJTrack**.

Digital transformation in educational management has become increasingly vital in streamlining operations and ensuring accountability. According to Alda (2023), the adoption of mobile attendance systems dramatically reduces administrative delays and minimizes human error by automating the validation process through QR code scanning. Similarly, Nurfaizi and Hindarto (2023) designed a web-based internship monitoring application that provided real-time updates between students and supervisors, demonstrating that web technologies enhance transparency and enable continuous feedback. These findings directly support the design philosophy of OJTrack, which combines Android accessibility with web-based administration to facilitate efficient and real-time OJT monitoring.

Local research within the Philippines also underscores the urgent need for digital monitoring systems in academic programs. Castro (2024) highlighted that manual OJT tracking results in incomplete data and slow evaluation turnaround, while his mobile- based internship tracker significantly improved efficiency and student accountability. Cabalbag et al. (2023) evaluated a similar OJT management system using ISO/IEC 25010 standards and reported high acceptability in usability, functionality, and performance efficiency. Their results validate the use of quality evaluation frameworks in assessing newly developed systems like OJTrack to ensure that they meet institutional and user expectations.

Artificial intelligence continues to influence the modernization of educational management platforms. Gupta et al. (2025) demonstrated that AI-powered tools can automate the generation of structured reports from raw text data, enhancing accuracy and reducing administrative burden. This approach parallels OJTrack's implementation of AI-assisted report generation, where brief student inputs and image uploads are converted into complete, formatted daily reports. Moreover, integrating automation and machine intelligence supports user consistency and promotes data-driven evaluation—two key objectives of OJTrack's design.

To summarize, previous studies have consistently shown that digital monitoring systems, particularly those integrating mobile and web technologies, yield substantial improvements in user efficiency and administrative accuracy. The inclusion of QR code- based attendance validation, intelligent report generation, and ISO/IEC 25010 evaluation collectively align OJTrack with current research trends in software quality and educational

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technology. By synthesizing these frameworks and methodologies, OJTrack addresses the persistent limitations of manual OJT supervision and contributes a scalable, innovative solution to institutional digital transformation.

Table 1. Summary of Relevant Literatures

No.	Paper Title	Author Name	Key points	Remarks
1	Mobile-Based Employee Attendance System Using Spiral Model	Alda (2023)	Demonstrated faster attendance processing using QR automation	Supports mobile attendance for OJT
2	Web-Based Monitoring System for Student Internships	Nurfaizi & Hindarto (2023)	Improved supervisor–trainee communication and feedback	Reinforces web-admin module
3	Mobile-Based Internship Tracker	Castro (2024)	Reduced manual reporting delays in OJT management	Validates local system need
4	Web-Based OJT Management System Evaluated Through ISO Standards	Cabalbag et al. (2023)	Reported high usability and functionality	Supports evaluation design
5	Generative AI for Automated Report Generation in Government Systems	Gupta et al. (2025)	Automated documentation through AI-driven text synthesis	Guides OJTrack's AI integration

In conclusion, the reviewed literature confirms that mobile and web-based OJT monitoring systems significantly enhance documentation efficiency and supervision accuracy. The inclusion of artificial intelligence and ISO-based evaluation further strengthens their reliability. These frameworks provide a strong foundation for developing OJTrack, a hybrid digital monitoring system that combines automation, accessibility, and data integrity to support student training oversight.

III. METHODOLOGY

The development of OJTrack: Android and Web-Based OJT Monitoring and Attendance System followed a systematic research approach to ensure both functionality and quality. The study used a descriptive-developmental research design, focusing on creating and evaluating a software system that addresses the inefficiencies of manual OJT monitoring. The descriptive component gathered feedback from users and experts, while the developmental component involved designing, programming, and testing the system. The Agile Software Development Life Cycle (SDLC) guided the process, allowing iterative improvement based on stakeholder input.

A. Research Design

The Agile methodology was selected for its adaptability and emphasis on user collaboration. Each sprint included planning, design, coding, and testing phases, enabling incremental progress and real-time adjustments to system requirements based on user feedback. This approach ensured transparency, faster iterations, and early detection of potential issues, meeting the goal of automating attendance validation and digitizing OJT documentation.

B. System Development

Development began with requirements analysis through interviews and surveys with OJT coordinators, supervisors, and students. Key requirements included QR code attendance logging, supervisor OTP validation, and AI-assisted reporting. The design phase produced use case diagrams, entity-relationship models, and data flow diagrams. System

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modules were built using React Native for Android, PHP and Vue.js for the web, and MySQL for the database. Testing followed Agile sprint cycles, including unit, integration, and user acceptance testing. Pilot testing with selected BSIT students and coordinators refined the system for deployment.

C. Participants and Locale

The study was conducted at North Eastern Mindanao State University – Cantilan Campus, Department of Computer Studies. Respondents included 30 participants: 10 IT experts, 10 OJT supervisors, and 10 BSIT trainees. Purposive sampling ensured that only individuals directly involved in OJT management contributed, providing both technical and practical insights into the system's performance and usability.

D. Data Gathering and Evaluation Tools

Data were collected using structured questionnaires and interviews based on the ISO/IEC 25010 software quality model, covering Functional Suitability, Performance Efficiency, Compatibility, Usability, Reliability, Security, Maintainability, and Portability. Responses used a 5-point Likert scale (1 = Not Acceptable to 5 = Very Highly Acceptable). Quantitative data were analyzed using weighted means, and qualitative feedback summarized recurring themes and suggestions.

E. Data Analysis Procedure

Weighted means were calculated for each ISO/IEC 25010 criterion and interpreted as:
4.21 - 5.00 (Very Highly Acceptable), 3.41 - 4.20 (Highly Acceptable), 2.61 - 3.40
(Moderately Acceptable), 1.81 - 2.60 (Slightly Acceptable), and 1.00 - 1.80 (Not Acceptable). The overall mean determined general system acceptability. Qualitative feedback from experts and users was analyzed thematically to support the quantitative results. This approach ensured thorough evaluation of usability, reliability, and efficiency, while improvements were guided by data and the iterative Agile process.

IV. RESULTS AND DISCUSSION

The development of OJTrack resulted in a functional and user-friendly system that automates the monitoring and documentation process of On-the-Job Training (OJT) activities. It provides students, supervisors, and coordinators with a seamless platform for managing attendance, daily reports, and progress tracking. The results of the evaluation are presented in this section, together with the discussion of findings gathered from the respondents during the system testing and assessment. The evaluation was based on the ISO/IEC 25010 quality model, covering eight key characteristics that measure system performance, usability, reliability, and overall efficiency.

A. System Overview

OJTrack was developed to replace traditional manual OJT procedures with a centralized digital platform, featuring an Android mobile app for trainees and supervisors and a web portal for coordinators and administrators. The mobile app allows students to log attendance via QR codes, verified with OTPs approved by supervisors, while AI- assisted reporting converts short daily notes into formatted accomplishment reports.
The web portal consolidates all data, enabling coordinators to monitor activities, validate records, and generate summary reports efficiently. By integrating mobile and web technologies, OJTrack ensures accessibility, transparency, and real-time updates, reduces manual errors, and enhances accountability for both students and supervisors during internship operations.

B. Evaluation Results

To assess the effectiveness of the system, 30 respondents composed of IT experts, OJT supervisors, and BSIT trainees evaluated OJTrack's performance. The results were analyzed using the weighted mean method and interpreted based on the five-point descriptive scale. The findings revealed that OJTrack attained an overall mean rating of 4.83, which corresponds to "Very Highly Acceptable" under the ISO/IEC 25010 standards.

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Table 2. Software Quality Evaluation of OJTrack

Table	Quality Characteristics	Mean	Verbal Interpretation
1	Functional Suitability	4.86	Very Highly Acceptable (VHA)
2	Performance Efficiency	4.78	Very Highly Acceptable (VHA)
3	Compatibility	4.80	Very Highly Acceptable (VHA)
4	Usability	4.90	Very Highly Acceptable (VHA)
5	Reliability	4.82	Very Highly Acceptable (VHA)
6	Security	4.84	Very Highly Acceptable (VHA)
7	Maintainability	4.79	Very Highly Acceptable (VHA)
8	Portability	4.80	Very Highly Acceptable (VHA)
Over-All Mean		**4.83**	**Very Highly Acceptable (VHA)**

V. CONCLUSION

The study developed and evaluated **OJTrack**, an Android and web-based On-the-Job Training (OJT) Monitoring and Attendance System designed to streamline internship supervision and documentation. The system features QR code attendance, OTP authentication, and AI-assisted report generation, improving efficiency, accuracy, and transparency while automating reporting and centralizing attendance tracking. Developed using the Agile SDLC, OJTrack adapted to user feedback and was rated "Very Highly Acceptable" (mean score 4.83) under the ISO/IEC 25010 quality model, confirming its functionality, usability, and reliability. IT experts, OJT supervisors, and students affirmed its ease of use and effectiveness, highlighting its potential as a scalable institutional solution. By integrating mobile, web, and AI technologies, OJTrack addresses administrative challenges, enhances accountability, and aligns with the trend of digital transformation in education. Its implementation demonstrates that modernized OJT processes can improve record accuracy, reduce workload, and support future expansion through analytics, company feedback modules, or cloud deployment, positioning OJTrack as a model for innovative, data-driven internship monitoring in higher education.

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