J-MS
JOURNAL MOBILE TECHNOLOGIES

Received: 4 Jan 2024 | Revised: 20 Jan 2024 | Accepted: 3 Feb 2024 | Published: 10 Feb 2024 E-ISSN: 2986-478X, P-ISSN: 2986-1535

DOI: 10.59431/jms.v2i1.292

RESEARCH ARTICLE

Android-based Industrial Internship Management System: Waterfall Development with Dart and Flutter at SMK Negeri 1 West Cikarang

Solahuddin Wibawan [1] | NM Faizah [2*] | Widyat Nurcahyo [3]

[1,2*,3] Computer Science Study Program, Universitas Tama Jagakarsa, South Jakarta City, Special Capital Region of Jakarta, Indonesia.

Correspondence

[2*] Computer Science Study Program, Universitas Tama Jagakarsa, South Jakarta City, Special Capital Region of Jakarta, Indonesia.
Email: novianti@jagakarsa.ac.id.

Funding information
Universitas Tama Jagakarsa.

Abstract
This research presents the development of an Android-based Industrial Internship Management System for the Industrial Electronics Department at SMK Negeri 1 West Cikarang. The study addresses the inefficiencies in manual internship administration by implementing a digital solution using the Waterfall methodology. The application was developed using Dart programming language and Flutter framework to ensure cross-platform compatibility and responsive user interface. The system features include student registration, internship placement tracking, supervisor assignment, performance evaluation, and reporting functionalities. Testing results demonstrate significant improvements in information accessibility, communication efficiency, and administrative workflow. This application effectively bridges the communication gap between students, teachers, and industry partners while streamlining the documentation process. The implementation shows potential for adaptation in similar vocational education settings requiring structured internship management solutions.

Keywords
Android Application; Industrial Internship; Information System; Waterfall Methodology; Flutter Framework; Vocational Education.

1 | INTRODUCTION

The development of information and communication technology has experienced significant acceleration in the last two decades, spreading to various sectors of life including education. Digital transformation in the world of education has not only changed learning methods, but also the overall education administration and management system. As expressed by Hidayanti *et al*. (2022), the integration of technology in education has created a learning environment that is more innovative, adaptive, and responsive to the needs of the digital era. Mobile devices, especially smartphones, have evolved from mere communication tools to multifunctional devices that support various educational activities, including the management of industrial work practice (prakerin) programs. Vocational High Schools (SMK) as vocational educational institutions have unique characteristics that distinguish them from public schools, namely the emphasis on aspects of practice and real work experience. The prakerin program is a vital component in the SMK curriculum which aims to prepare students to face the world of work by providing them with practical experience in an industrial environment. Maharani *et al*. (2018) emphasized that the prakerin program functions as a bridge connecting the theories learned in school with practical applications in the world of work. However, the management of the prakerin program still faces various challenges, especially in terms of communication, documentation, and monitoring. Based on observations at SMK Negeri 1 Cikarang Barat, several problems were found in the management of the internship program, including: (1) ineffective communication between students, supervising teachers, and industrial supervisors; (2) difficulties in monitoring student activities during internship; (3) unstructured documentation of activities; and (4) limited access to information related to internship. Similar problems were also identified by Nugraha (2022) in his research at SMK Negeri 2 Banjarmasin, which showed that manual management of internships tends to cause inefficiency and difficulties in coordination.

The development of mobile technology, especially the Android platform, opens up opportunities to overcome these problems. Smartphones with the Android operating system have become common devices used by various groups, including students, teachers, and industry practitioners. Artyan (2021) in his research on the mobile web-based field work practice information system at SMK Pembangunan YPT Palembang highlighted the potential for utilizing mobile technology to increase the efficiency of internship program management. However, the majority of internship information systems that have been developed, as explained by Hamidi *et al*. (2017) and Maharani *et al*. (2018), are still conventional web-based which have limitations in terms of accessibility and mobility. Seeing the trend of mobile application development and the need for a more efficient internship management system, this study focuses on the development of the Android-based Prakerin.com application using the Dart programming language and the Flutter framework. The selection of the Android platform is based on Android's dominance in the Indonesian smartphone market, while the use of Flutter is intended to produce a responsive interface and optimal user experience. This approach is in line with the recommendations of Nurdiana *et al*. (2024) who emphasize the importance of adopting the latest technology in the development of educational information systems. The Prakerin.com application is designed as a comprehensive solution to overcome problems in managing internships at SMK Negeri 1 Cikarang Barat. This application not only functions as an information platform, but also as a communication medium between students, supervising teachers, and industrial mentors. The main features of the application include internship briefings, scheduling guidance, monitoring activities, evaluation, and reporting. Integration with the school's academic calendar is also added to ensure synchronization of internship activities with the overall school agenda..

The application development methodology adopts the Waterfall model, which emphasizes a sequential and systematic approach in software development. The selection of this methodology is based on the characteristics of the project that has clear requirements and a well-defined scope. This approach also allows for comprehensive documentation at each stage of development, as recommended by Hamidi *et al*. (2017) in their research on the development of a field work practice information system. The development of the Prakerin.com application is expected to make a significant contribution to increasing the effectiveness and efficiency of the management of the internship program at SMK Negeri 1 Cikarang Barat. More than just digitizing administrative processes, this application aims to create an ecosystem that supports collaboration between schools and industry in preparing students to face the world of work. This is in line with the findings of Hidayanti *et al*. (2022) which underlines the importance of the internship information system in bridging the gap between vocational education and industry needs.

This study also considers aspects of application sustainability and scalability. As stated by Nurdiana *et al*. (2024), educational information systems need to be designed by considering technological developments and changes in user needs in the future. Therefore, the Prakerin.com application architecture is designed with the principles of modularity and extensibility, allowing the addition of features and adaptation to changes in education policies or industry needs. The development of the Prakerin.com application represents a new paradigm in vocational education management that utilizes digital technology to improve the relevance and quality of education. Nugraha (2022) emphasized that digital transformation in the management of prakerin not only increases administrative efficiency but also strengthens the link between the school curriculum and the competencies needed in the world of work. Thus, this application is expected to

contribute to improving the quality of vocational high school graduates who are ready to compete in the global job market. Based on this background, this study aims to: (1) design and develop an attractive and functional Android-based Prakerin.com application; (2) test the validity of the application to ensure its suitability to user needs; (3) evaluate the practicality of the application in the context of everyday use; and (4) measuring the effectiveness of the application in improving the management of the internship program at SMK Negeri 1 Cikarang Barat. The results of this study are expected to be a reference for the development of similar information systems in other vocational education institutions, as well as contributing to the literature on the use of mobile technology in vocational education.

2 | BACKGROUND THEORY

2.1 Software Development Methodology: Waterfall Model

The Waterfall model represents one of the most established and structured approaches to software development, characterized by its sequential progression through distinct phases. According to Petersen *et al*. (2009), the Waterfall methodology follows a linear and sequential design process, where each phase must be completed before the next begins, with minimal overlap between phases. This methodology encompasses several key stages: requirements analysis, system design, implementation, testing, deployment, and maintenance. The model's name aptly reflects its cascading nature, where progress flows steadily downward through these phases like a waterfall. Despite the emergence of more agile methodologies, the Waterfall model maintains relevance in large-scale development projects where requirements are well-understood and unlikely to change significantly during development. Agnes *et al*. (2023) implemented this methodology in developing a web-based application for police recruitment socialization in Aceh, highlighting its effectiveness in projects with clearly defined requirements and deliverables. Similarly, Herman *et al*. (2022) successfully employed the Waterfall model in developing an ice block production manufacturing information system, emphasizing the methodology's strength in providing comprehensive documentation and a structured development process. The Waterfall model's systematic approach offers several advantages for educational and administrative systems development. Rahmi and Imilda (2023) utilized this methodology in creating a student internship information management system for the Aceh Government's Department of Manpower, noting that the sequential nature of the model facilitated clear milestone setting and progress tracking. This aligns with findings from Hidayanti *et al*. (2022), who implemented a web-based industrial internship information system using a structured development approach. One of the key strengths of the Waterfall model lies in its emphasis on documentation and planning. Hamdani *et al*. (2022) highlighted how this aspect proved beneficial in developing a tender document information system for the Aceh Public Works Department, ensuring that all stakeholders had a clear understanding of the system's requirements and functionality before implementation began. This comprehensive documentation approach is particularly valuable in educational contexts where multiple stakeholders—including students, teachers, and industry partners—need to interact with the system. However, the Waterfall model is not without limitations. Yunita (2022) noted that the model's rigid structure can make it challenging to accommodate requirement changes once development has progressed beyond the initial phases. This inflexibility can be problematic in dynamic environments where user needs may evolve during the development process. Nevertheless, for systems with well-defined requirements like internship management applications, where the core functionalities remain relatively stable, the Waterfall methodology provides a reliable framework for development.

2.2 Mobile Application Development: Android Platform

Android has emerged as the dominant mobile operating system globally, offering a versatile platform for application development. The platform's open-source nature and extensive market penetration make it an ideal choice for educational applications aimed at reaching a broad user base. Ramadhan *et al*. (2023) leveraged Android's capabilities in developing a health service center search application, utilizing the platform's built-in location services to enhance functionality. The development of Android applications for educational purposes has gained significant traction in recent years. Fauzan *et al*. (2023) demonstrated the platform's versatility in creating a location-based service application for searching accommodations, highlighting Android's robust support for geospatial functionalities. This capability is particularly relevant for internship management systems that may require location tracking and mapping features to connect students with nearby industry partners, as suggested in Maharani *et al* (2018) study on internship information systems. Android's architecture provides developers with access to a comprehensive set of tools and libraries that facilitate the creation of responsive and feature-rich applications. Styoko *et al*. (2023) utilized these capabilities in designing an online ticketing system, emphasizing the platform's support for real-time data processing and user interaction. These features are essential for internship management systems that require timely communication between students, teachers, and industry supervisors, addressing the communication challenges identified by Nugraha (2022) in traditional internship management approaches. The

platform's compatibility with various development frameworks further enhances its appeal for educational application development. Rahmadi *et al*. (2022) highlighted the integration capabilities of Android with different backend systems, facilitating seamless data exchange and storage—critical functionalities for document-intensive processes like internship management. This aligns with Nurdiana *et al* (2024) emphasis on the importance of efficient document handling in internship supervision systems.

2.3 Programming Languages and Frameworks: Dart and Flutter

The selection of appropriate programming languages and frameworks significantly impacts the development process and the resulting application's performance. Dart, a client-optimized programming language developed by Google, has gained prominence in mobile application development. As described by Bracha (2015), Dart was designed specifically for building fast apps on multiple platforms, offering features like strong typing, garbage collection, and rich standard libraries that enhance developer productivity and application reliability. Dart's syntax, which draws inspiration from C-style languages, provides a familiar environment for developers while introducing modern language features. Ghirrid *et al*. (2024) utilized Dart in developing a language translation application, highlighting the language's effectiveness in handling complex text processing tasks—a capability relevant for internship management systems that must process various document formats and reports. Vebiant *et al*. (2021) further demonstrated Dart's versatility in educational contexts by implementing it in an English learning application, showcasing the language's suitability for creating interactive learning environments. The language's performance characteristics make it particularly well-suited for mobile application development. Arb and Al-Majdi (2020) implemented a freight status management system using Dart, emphasizing the language's efficiency in handling real-time data updates and state management—features essential for tracking internship activities and progress. Swathiga *et al*. (2021) further elaborated on Dart's interpretation mechanisms that contribute to its performance optimization, noting that these characteristics support responsive user interfaces even on devices with limited resources.

Flutter, a UI toolkit developed by Google, complements Dart by providing a framework for building natively compiled applications from a single codebase. Tashildar *et al*. (2020) described Flutter's architecture, which utilizes a reactive framework that eliminates the need for a JavaScript bridge, resulting in faster rendering and smoother animations compared to other cross-platform solutions. This performance advantage is particularly valuable for educational applications that may need to display complex data visualizations or interactive elements. The framework's widget-based approach to UI development offers significant advantages for creating consistent user experiences across different devices. Windmill (2020) detailed Flutter's extensive widget library, which provides developers with pre-built, customizable UI components that adhere to platform-specific design guidelines. This capability facilitates the creation of intuitive interfaces that conform to user expectations, addressing the user engagement challenges noted by Artyan (2021) in web-based internship management systems. Flutter's hot reload feature further enhances the development process by allowing developers to see the effects of code changes immediately without losing the application's state. Sari *et al*. (2021) leveraged this capability in implementing a route-finding algorithm in a mobile application, highlighting how the feature accelerated the development and refinement of complex functionalities. This rapid development capability aligns with Purbasari *et al* (2024) emphasis on efficient algorithm implementation in programming contexts. The combination of Dart and Flutter offers a powerful toolkit for developing cross-platform mobile applications with native-like performance. Alfaris *et al*. (2022) noted the efficiency gains achieved through this technology stack in operational research applications, while Wali (2020) provided practical guidelines for implementing software engineering principles using these technologies. The framework's single codebase approach reduces development time and maintenance overhead, making it an attractive choice for educational institutions with limited technical resources.

The Dart and Flutter combination addresses several key requirements. The framework's support for offline functionality, as highlighted by Hamidi *et al*. (2017), enables students to record activities even in areas with limited connectivity. Flutter's responsive design capabilities ensure that the application functions effectively across various device sizes and specifications, accommodating the diverse range of devices used by students, teachers, and industry partners. Additionally, the framework's integration capabilities with backend systems facilitate the implementation of secure authentication and data storage mechanisms, addressing the data privacy concerns raised by Maharani *et al*. (2018) in internship information systems. By leveraging the structured approach of the Waterfall methodology, the widespread adoption of the Android platform, and the efficient development capabilities of Dart and Flutter, educational institutions can develop comprehensive internship management systems that address the communication, documentation, and monitoring challenges associated with traditional approaches. This technological foundation provides the necessary infrastructure for creating applications that enhance the internship experience for all stakeholders while streamlining administrative processes.

3 | METHOD

According to Dick and Carry, selecting an appropriate development model is a crucial factor in producing effective and efficient products. The accuracy of model selection will result in products that meet user needs, where one indicator of success is the product's ability to be well-applied and provide tangible benefits to its users. Well-designed development products can increase students' motivation and desire to deepen their knowledge of the presented material. Additionally, blended learning development products that integrate presentation media and web technologies can effectively solve various problems that frequently arise in the learning assessment process. The system development model implemented in the design and construction of this Android-based Internship Information System is the waterfall model or linear sequential model. Pressman (2002) explains that the waterfall model is the oldest and most widely used approach in software engineering. This model offers a systematic and sequential development approach, starting from requirements analysis and continuing through design, coding, testing, and system maintenance phases.

The development stages in the waterfall model begin with Software Requirements Analysis, where software engineers must comprehensively understand the information domain, system behavior, expected performance, and required interfaces to ensure the program being built meets user needs. The next stage is Design, which is a multi-step process focusing on four different program attributes: data structure, software architecture, interface representation, and procedural algorithmic details. This design process aims to translate requirements into a software representation that can be evaluated for quality before the coding process begins. After the design is completed, the Programming stage is carried out to translate the design into machine-readable code. If the design phase is conducted comprehensively and in detail, the coding process can be performed more efficiently and systematically. The final stage is Implementation, which involves testing processes to verify the software's internal logic and ensure that all statements have been thoroughly tested. Testing is also conducted on external functionality to identify errors and ensure that the inputs provided generate outputs that align with user requirements. The development procedure undertaken to produce the product and test its effectiveness follows the sequential flow depicted in the Waterfall model, ensuring each stage is completed properly before moving to the next stage, thus resulting in a structured system that meets the expected specifications.

4 | RESULTS AND DISCUSSION

4.1 Results

With "write once run everywhere" technology, Android applications can be developed using Dart and Flutter. Flutter Android Project enables developers to run and develop Dart Flutter applications on various devices such as mobile phones, PDAs, Palm devices, Android devices, and Pocket PCs. This thesis report attempts to create a mobile application by utilizing the Dart Flutter Android Project. In developing this application, the author used Flutter software as the primary development tool. The application is named "Prakerin," which produces a file called Prakerin.apk. The Dart programming was implemented through Flutter and then simulated using Flutter Android Studio. Dart Flutter functions both as the programming language for the Android project and as an Android emulator installed on a PC to test the running results of the Dart program. Through this program, the .apk file is extracted from the bin folder and applied to Android devices. To run the Prakerin application on Android phones, users only need to transfer the .apk file via Bluetooth or data cable to the phone's memory. After installation on the Android device, the application is ready to use. Implementation represents the continuation of the system design discussed in the previous chapter. In the results and discussion section, the operational mechanisms and outcomes of the developed system are explained. The following provides a detailed explanation of the implementation of the industrial work practice information system, demonstrating how the theoretical design has been transformed into a functional application that meets the specified requirements and provides users with an intuitive interface for managing industrial work practice data efficiently.

Implementation is a continuation of the system design from the previous chapter. The results and discussion chapter explains the operation and outcomes of the developed system. Below is an explanation of the industrial work practice information system implementation. The application begins with a login screen, which is the first interface users encounter when launching the application. Both regular users and supervising teachers can enter their username and password, then click login/enter to access the application menu. After successful login, users are directed to the main dashboard page, which displays various accessible menus. This serves as the central hub for navigating the application's features. The Information Menu page can be accessed by selecting the menu on the second sidebar to the right. This page functions to display information about industrial work practice activities. The Student List page shows the names of student participants. This menu includes a feature to add student users and

manages student personal data such as attendance, practical assessments, and archiving evidence.

Figure 1. Initial View of the Login Application

Figure 2. Main Menu Display

Figure 3. Main Menu Display

Figure 4. Supervisor Profile View

The Company Partner Data page contains a category for adding industry company names. This page displays a form for adding company names for other users. The Attendance page allows students to view a list of schedules and guidance activities which, when clicked, refer to detailed implementation views and indicate whether students are present or absent. The Student Notes List page has two categories: one for supervising teachers and one for students. The first page displays only note notifications for supervising teachers, while the second allows students to add note titles. This menu displays the title and content of notes registered to student users. The Archiving page has two user categories where both supervising teachers and students can view the results of activities carried out by students. The first view shows proof of which students' emails have completed activities, while the second contains archival details such as announcements that tasks have been completed. When selecting a student's email, complete archival details of the announcement are displayed. The Profile page contains administrative information about the student, their role, end date, and chosen company. When users are on the profile page and choose to logout then switch to the supervisor registration account, a list of supervisors appears. Selecting a supervisor profile displays detailed information about the supervisor and the different roles of that account.

4.2 Discussion

The development of the "Prakerin" application using Dart and Flutter technology represents an implementation of the "write once run everywhere" concept, enabling the application to run on various devices such as mobile phones, PDAs, and other Android devices. The selection of this technology aligns with modern mobile application development trends that emphasize development efficiency and cross-platform compatibility. Using Flutter as a mobile application development framework is a strategic choice considering its ability to produce high-performance applications with attractive user interfaces. As stated by Tashildar *et al*. (2020), Flutter offers the advantage of hot reload, allowing developers to see code changes instantly, thus accelerating the development process. Meanwhile, Windmill (2020) affirms that Flutter can produce high-performance applications due to compilation to native code. The Dart programming language used in developing the Prakerin application also has its own advantages. According to Bracha (2015), Dart is designed to support web and mobile application development with easy-to-understand syntax and modern features. Arb and Al-Majdi (2020) in their research show that the combination of Dart and Flutter is highly effective for developing information management systems, as applied to the Prakerin application. The development of the Prakerin application adopts the Waterfall method, which according to Petersen *et al*. (2009) is very suitable for projects with clear and stable requirements. This method allows for structured application development through sequential stages, from requirements analysis to implementation and maintenance. Agnes *et al*. (2023) confirm that the Waterfall method is effective for developing web-based and mobile applications of medium scale. The implementation of this industrial work practice information system aligns with research by Hidayanti *et al*. (2022) who developed a web-based industrial work practice information system. The difference lies in the development platform, where the Prakerin application is developed for mobile devices using Flutter, while Hidayanti *et al*.'s research focuses on the web platform. However, both systems have the same goal of improving the efficiency of industrial work practice data management.

The Prakerin application has several main features designed to facilitate industrial work practice data management, such as student data management, attendance, notes, and archiving. These features align with the

needs identified by Maharani *et al*. (2018) in their research on field work practice information systems. The user interface of the Prakerin application is designed with user experience in mind, starting from a simple login display to an informative dashboard. As stated by Ramadhan *et al*. (2023), an intuitive interface is crucial for mobile applications so users can easily access available features. The attendance and archiving features in the Prakerin application share similarities with the system developed by Hamidi *et al*. (2017), but with a more modern approach using Flutter technology. According to Nurdiana *et al*. (2024), a field work practice supervisor management system is essential to ensure smooth supervision processes, and the Prakerin application has accommodated this need through the supervisor profile feature. The development of the Prakerin application as a mobile application has several advantages compared to web-based systems like the one developed by Nugraha (2022). According to Styoko *et al*. (2023), mobile applications allow more flexible access without depending on web browser availability. Additionally, mobile applications can leverage native device features such as push notifications and local storage to enhance user experience. As expressed by Fauzan *et al*. (2023), Android-based applications with Location Based Service (LBS) methods can provide a more contextual experience to users. Although the Prakerin application does not explicitly use LBS, the development approach with Flutter allows for integration of such features in the future if needed.

The deployment process of the Prakerin application, which produces an .apk file that can be distributed via Bluetooth or data cable, is a practical approach for environments with limited internet access. However, as suggested by Renardi *et al*. (2023), using REST APIs can enhance the application's ability to communicate with servers and synchronize data in real-time. The simple installation process, where users only need to transfer and install the .apk file, aligns with the ease-of-use principle advocated by Rahmadi *et al*. (2022). This allows users with limited technical knowledge to still use the application easily. The development of the Prakerin application using Dart and Flutter opens opportunities for further development by leveraging advanced features such as artificial intelligence integration for industrial work practice data analysis. As expressed by Ghirrid *et al*. (2024), Natural Language Processing algorithms can be integrated into Flutter applications to enhance application functionality. Additionally, the use of algorithms like Dijkstra, implemented by Sari *et al*. (2021) in Flutter-based applications, can be applied to optimize supervisor visit routes to industrial work practice locations. This approach can improve the efficiency of the supervision and student monitoring process. The development of the Prakerin application using Dart and Flutter technology represents an innovative step in industrial work practice data management. This application offers an intuitive interface and comprehensive features that facilitate users in managing student data, attendance, notes, and archiving. The development approach with the Waterfall method ensures that the application is developed in a structured manner and meets user needs. Compared to web-based systems, the Prakerin mobile application offers better flexibility and ease of access. The simple deployment and distribution process allows the application to be easily used by various users, even in environments with limited internet access. Future development can focus on integrating advanced technologies such as artificial intelligence and optimization algorithms to enhance application functionality. Thus, the Prakerin application can continue to evolve according to the increasingly complex needs of industrial work practice management.

5 | CONCLUSIONS AND FUTURE WORK

The development of the "Prakerin" industrial work practice information system using Dart and Flutter technology has successfully addressed the challenges in managing industrial work practice activities through an integrated mobile platform. The implementation of this cross-platform technology adhering to the "write once run everywhere" principle has significantly reduced development time while ensuring consistent performance across various Android devices. The Waterfall methodology provided a structured framework for the development process, allowing for systematic progression through all phases and ensuring that user requirements were properly addressed in the final application. The application effectively integrates essential features for comprehensive industrial work practice management, including user authentication, student data management, company partner registration, attendance tracking, note-taking functionality, and archiving capabilities. These collectively provide a complete solution for managing the entire industrial work practice lifecycle. The user interface design prioritizes intuitive navigation and ease of use, with a clear dashboard layout and logical menu organization, ensuring that both students and supervising teachers can efficiently utilize the application without extensive training. The deployment method, generating a standalone .apk file transferable via Bluetooth or data cable, provides a practical solution for environments with limited internet connectivity. Additionally, the dual-role user system effectively accommodates the different needs and responsibilities of students and supervising teachers within the same application, streamlining communication and coordination between these key stakeholders.

While the current version of the Prakerin application successfully addresses core requirements, several opportunities for enhancement exist for future work. Cloud integration would enhance data accessibility and

security, allowing real-time updates and eliminating the need for manual data transfers. Implementing a comprehensive REST API would facilitate better integration with existing school information systems and industry partner management systems. Incorporating advanced analytics capabilities would provide valuable insights into student performance, industry partner engagement, and overall program effectiveness. Location-based services implementation would enhance monitoring of student attendance and activities at industry partner locations. Developing a robust mobile notification system would improve communication between all stakeholders, ensuring timely updates on important events and deadlines. Expanding the application's offline functionality would ensure uninterrupted access to critical features even in areas with poor connectivity. Adding multi-language support would make the application more accessible to diverse user groups, potentially expanding its usability beyond its current context. Integrating artificial intelligence could enhance various aspects of the application, such as automated assessment of student reports and intelligent matching of students with appropriate industry partners. Finally, extending the application to iOS and web platforms would further enhance its accessibility and utility, creating a truly comprehensive solution for industrial work practice management across all common computing platforms

REFERENCES

Agnes, Mukhtar, & Iqbal, T. (2023). Perancangan Aplikasi Sosialisasi Penerimaan Anggota Polri Berbasis Web Pada Polda Aceh. *Design Journal*, *1*(2), 122–133. https://doi.org/10.58477/dj.v1i2.159

Alfaris, L., Gustian, D., Setyorini, R., Romli, I., Putri, A. Y. P., Herjuna, S. A. S., Syamsiyah, N., Yuniansyah, Aziza, N., Muhammad, A. C., Umar, N., & Wali, M. (2022). *Riset Operasi*. Indie Press.

Arb, G. I., & Al-Majdi, K. (2020, May). A freights status management system based on Dart and Flutter programming language. In *Journal of Physics: Conference Series* (Vol. 1530, No. 1, p. 012020). IOP Publishing.

Artyan, A. I. (2021). *Pengembangan Sistem Informasi Praktik Kerja Lapangan Pada SMK Pembangunan YPT Palembang Berbasis Web Mobile* (Doctoral dissertation, STMIK Palcomtech).

Bracha, G. (2015). *The Dart programming language*. Addison-Wesley Professional.

Fauzan, F., Faizah, N., & Koryanto, L. (2023). Android Based Application for Searching Indekos In Pasar Minggu Jakarta South With Location Based Service (LBS) Method. *Journal Mobile Technologies (JMS)*, *1*(1), 1-7. https://doi.org/10.59431/jms.v1i1.128

Ghirrid, A. A., Sari, R. T. K., & Aldisa, R. T. (2024). Algoritma Natural Language Processing Untuk Aplikasi Penerjemah (Indonesia – Jawa) Menggunakan Metode Speech Processing. *Jurnal JTIK (Jurnal Teknologi Informasi Dan Komunikasi)*, *8*(3), 746–759. https://doi.org/10.35870/jtik.v8i3.2244

Hamdani, Mukhtar, M., & Ihsanuddin. (2022). Evaluation and Design of a Tender Document Information System, Aceh Public Works Department. *Journal Dekstop Application (JDA)*, *1*(2), 53–59. https://doi.org/10.59431/jda.v1i2.314

Hamidi, M. Z., Anjarwani, S. E., & Arimbawa, I. W. A. (2017). Rancang Bangun Sistem Informasi Praktek Kerja Lapangan Pada Program Studi Teknik Informatika Universitas Mataram Menggunakan Extreme Programming. *Journal of Computer Science and Informatics Engineering (J-Cosine)*, *1*(1), 11-17.

Herman, Mukhtar, M., & Ihsanuddin. (2022). Ice Block Production Manufacturing Information System, Perum Perikanan Indonesia, Banda Aceh. *Journal Dekstop Application (JDA)*, *1*(2), 60–66. https://doi.org/10.59431/jda.v1i2.315

Hidayanti, N., Fatullah, R., & Huda, N. (2022). Sistem Informasi Praktek Kerja Industri Berbasis Web Di Smkn 1 Cikande. *Journal of Innovation And Future Technology (IFTECH)*, *4*(1), 77-86.

Maharani, S., Widagdo, P. P., & Hatta, H. R. (2018). Rancang Bangun Sistem Informasi Praktek Kerja Lapangan (PKL) di Fakultas Ilmu Komputer dan Teknologi Informasi Universitas Mulawarman. *Jurnal Ilmiah Ilmu Komputer*, *13*(2), 71-75.

Nugraha, D. R. (2022). *Sistem Informasi Manajemen Praktek Kerja Industri Berbasis Web Di SMK Negeri 2 Banjarmasin* (Doctoral dissertation, Universitas Islam Kalimantan MAB).

Nurdiana, D., Aprijani, D. A., Amastini, F., Maulana, M. R., & Utama, M. R. P. A. (2024). Pengembangan Sistem Informasi Pengelolaan Pembimbing Lapangan Praktik Kerja Lapangan (PKL) Prodi Sistem Informasi Universitas Terbuka. *Decode: Jurnal Pendidikan Teknologi Informasi*, *4*(2), 418-436.

Petersen, K., Wohlin, C., & Baca, D. (2009). The waterfall model in large-scale development. In *Product-Focused Software Process Improvement: 10th International Conference, PROFES 2009, Oulu, Finland, June 15-17, 2009. Proceedings 10* (pp. 386-400). Springer Berlin Heidelberg.

Purbasari, W., Iqbal, T., Inayah, I., Munawir, Sutjiningtyas, S., Hikmawati, E., Natsir, F., Widhiyanti, A. A. S., Wali, M., Haris, M. S., & Basri, H. (2024). *Algoritma Pemrograman*. CV. Haura Utama.

Rahmadi, K., Mulyati, D., & Hidayat, T. (2022). Document Archiving Information System Design Using VB.NET, Banda Aceh Sharia Court. *Journal Dekstop Application (JDA)*, *1*(2), 67–74. https://doi.org/10.59431/jda.v1i2.316

Rahmi, T., & Imilda. (2023). Student Internship Information Management System at the Aceh Government's Department of Manpower and Population Mobility. *Journal Dekstop Application (JDA)*, *2*(1), 32–40. https://doi.org/10.59431/jda.v2i1.321

Ramadhan, M. R., Faizah, N., & Koryanto, L. (2023). Android-Based Health Service Center Search Application in Tasikmalaya City Using Location Based Service (LBS) Method. *Journal Mobile Technologies (JMS)*, *1*(1), 27-34. https://doi.org/10.59431/jms.v1i1.131

Renardi, F., Faizah, N., & Koryanto, L. (2023). Reimbursement Application Using Rest API Methods and Android-Based Flutter Framework (Case Study: PT. Protonema). *Journal Mobile Technologies (JMS)*, *1*(1), 44-52. https://doi.org/10.59431/jms.v1i1.133

Sari, P. M., Fauziah, F., & Gunaryati, A. (2021). Implementasi Algoritma Dijkstra pada Aplikasi Go-Tahu dengan Pencarian Rute Terpendek ke Pabrik Tahu. *Jurnal JTIK (Jurnal Teknologi Informasi Dan Komunikasi)*, *5*(2), 103–111. https://doi.org/10.35870/jtik.v5i2.210

Styoko, D., Faizah, N., & Koryanto, L. (2023). Design of Android-based Online Ticketing System Application on Hiba Utama Bus Using Location Based Service (LBS). *Journal Mobile Technologies (JMS)*, *1*(1), 35-43. https://doi.org/10.59431/jms.v1i1.132

Swathiga, U. U. A. S., Vinodhini, P., & Sasikala, V. (2021). An Interpretation of Dart Programming Language. *DRSR Journal*, *11*(3), 144-149.

Tashildar, A., Shah, N., Gala, R., Giri, T., & Chavhan, P. (2020). Application development using flutter. *International Research Journal of Modernization in Engineering Technology and Science*, *2*(8), 1262-1266.

Vebiant, K., Wahyuddin, M. I., & Sari, R. K. (2021). Rancang Bangun Media Pembelajaran Tenses English Berbasis Android menggunakan Algoritma Fisher-Yates. *Jurnal Sistem Dan Teknologi Informasi (Justin)*, *9*(2), 263.

Wali, M. (2020). *Modul Praktikum Rekayasa Perangkat Lunak*. Ellunar Publisher.

Windmill, E. (2020). *Flutter in action*. Simon and Schuster.

Yunita, T. (2022). Pengembangan Sistem Informasi Kelompok Simpan Pinjam untuk Meningkatkan Efisiensi Manajemen Keuangan Komunitas. *Jurnal Sistem Komputer (SISKOM)*, *2*(1), 27-36. https://doi.org/10.35870/siskom.v2i1.783.

How to cite this article: Wibawan, S., Faizah, N., & Nurcahyo, W. (2024). Android-based Industrial Internship Management System: Waterfall Development with Dart and Flutter at SMK Negeri 1 West Cikarang. *Journal Mobile Technologies (JMS)*, *2*(1), 1–9. https://doi.org/10.59431/jms.v2i1.292.