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Effortless Attendance Recording with MyOnTime: A Modern Approach for Educational Institutions

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Abstract: This study introduces MyOnTime, an innovative application designed to revolutionize student attendance management at Sekolah Indonesia Kota Kinabalu (SIKK) in response to the evolving educational landscape in the aftermath of the COVID-19 pandemic. The primary objective of this research was to develop an efficient and user-friendly solution that enhances attendance recording, promotes administrative efficiency, and aligns with current health and environmental guidelines. To achieve this goal, we employed the Extreme Programming (XP) and harnessed the AppSheet platform, a low-code application development tool. MyOnTime offers a streamlined approach to attendance recording through barcode scanning, minimizing manual data entry and reducing reliance on paper-based methods. We conducted a comprehensive user survey to evaluate the application's functionality, responsiveness, and reliability. The results indicate overwhelmingly positive user feedback, highlighting MyOnTime's effectiveness and its ability to meet the specific needs of students, teachers, and administrative staff. MyOnTime empowers educational institutions by providing real-time attendance data, comprehensive reporting capabilities, and a user-friendly interface. It supports sustainable practices by reducing paper waste and contributes to a more organized and disciplined learning environment. MyOnTime represents a promising tool for enhancing the educational experience in the post-pandemic era, promoting efficiency, convenience, and environmental friendliness in attendance management.

Keywords: Administrative efficiency; AppSheet platform; Attendance management; Extreme programming (XP)

Introduction

The advent of COVID-19 has ushered in a new era in education, employment, and various other spheres, underpinned by the integration of technology (Haetami, 2023). This viral outbreak has particularly impacted the educational landscape, necessitating a shift from traditional in-person classroom teaching to remote learning facilitated by technology (Rahmawati et al., 2022). Harnessing Information Technology effectively in this digital age holds the promise of significant advancements in employee performance (Trisninawati et al., 2023). In anticipation of new habits, educational institutions are taking proactive measures, such as promoting health, providing health facilities, and establishing infrastructure to support health behavior (Nurmalahayati et al., 2022).

In the wake of the Covid-19 pandemic, Sekolah Indonesia Kota Kinabalu (SIKK) confronts the challenge of resuming regular educational activities while adhering to stringent health protocols like mask-wearing, hand sanitization, and physical distancing. In this context, MyOnTime, which stands for "Make Yourself Organized, Never Overlook Timeliness," emerges as a groundbreaking online application designed to revolutionize the recording of student attendance. The importance of effective attendance recording and management has been underscored globally (Arif et al., 2018).

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After the pandemic, SIKK is undergoing a significant shift in its student attendance recording system, moving away from traditional methods towards a more effective and streamlined approach. The conventional approach to managing attendance often relied on teachers or monitors taking manual roll calls, which posed several challenges, including burdening educators and potential fairness issues (Xun et al., 2022). Hendry et al. (2017) pointed out that the traditional method was characterized by labor-intensive, repetitive, and cumbersome procedures, heavily reliant on manual tools such as pencils, pens, and paper. Utilizing paper-based methods for school attendance occasionally led to errors and proved to be a time-consuming process (Mahasathyavathi, 2019). Additionally, these methods were deemed inefficient (Khan et al., 2022). Moreover, manual attendance recording using these techniques was notably time-consuming, especially in larger classrooms, and raised concerns about the possibility of students falsifying their attendance (Alsideiri et al., 2022; Noor et al., 2015).

To address these challenges, MyOnTime presents a practical and efficient solution for students, teachers, and administrative staff, harnessing modern technology. Through a straightforward barcode scan on student cards, it swiftly and accurately records attendance, relieving students from the hassles of manual record-keeping and misplaced attendance sheets while fostering a sense of responsibility and punctuality. Barcode technology, as noted by Elaskari et al. (2021), minimizes data input errors and enhances data entry efficiency at a cost-effective rate, compared to traditional approaches that involved the creation of barcode tags and hardware. It offers numerous advantages, including reduced time consumption and electronic data storage, eliminating the reliance on paperwork.

The significance of attendance is not limited to educational institutions but extends to the workplace community, where leaders, as highlighted by Imanullah et al. (2022), place considerable importance on effective attendance management. MyOnTime, with its real-time attendance management capabilities, empowers teachers and school administration staff with access to attendance data, charts, and comprehensive reports. This facilitates timely interventions and enhances student engagement, as emphasized by Eridani et al. (2021), who underscored the fundamental role of attendance records in various settings, including offices, campuses, and schools. These records not only verify an individual's presence but also enable the identification and resolution of potential issues or challenges related to an event.

MyOnTime brings exceptional advantages, including time-saving automation, streamlined administrative tasks, and robust attendance reporting and analysis features. Developed using the Extreme Programming method, it ensures a user-friendly experience through the low-code platform, AppSheet, as mentioned by Petrović et al. (2021). AppSheet allows users to personalize generated views to suit their preferences, including selecting the preferred visualization method such as deck, table, chart, or graph. MyOnTime also demonstrates a commitment to environmental friendliness by replacing paper-based attendance methods, contributing to reduce paper waste and supporting a cleaner and more sustainable environment.

The adoption of MyOnTime at Sekolah Indonesia Kinabalu promises to enhance the learning experience by promoting efficiency, convenience, and organizational discipline in attendance management—a vital aspect in the post-pandemic learning environment.

Method

MyOnTime was built using the Extreme Programming (XP) methodology, which boasts several key features that significantly enhance the software development process. XP promotes continuous code revision through practices like pair programming, where two developers collaborate on the same codebase to identify and resolve issues. Unlike traditional methodologies that involve lengthy development cycles, XP focuses on short and frequent iterations to accelerate the development process (Fojtik, 2011). In this methodology, not only the development team but also the customers actively participate by declaring the product expectations, expressed as requirements, commonly referred to as user feedback (Afshari et al., 2022).

XP is a well-established agile software development model known for its agility in adapting to changing requirements while ensuring high customer satisfaction (Anwer et al., 2017). It places a strong emphasis on effective communication and active customer involvement, underscoring the importance of interpersonal and social skills within the development team to efficiently deliver modules to customers during each iteration (Salido O. et al., 2023). Agile approaches, as highlighted by Van Casteren (2017), incorporate short iterative cycles, feature planning, and dynamic prioritization as essential components. While agile software development (ASD) generally prioritizes functional requirements over quality requirements and advocates limited documentation (Behutiye et al., 2020), it offers the flexibility to accommodate alterations during the software development process, which can

occasionally be unpredictable and may impact both the software's cost and timeline (Habib et al., 2023).

XP follows several stages, including planning, design, coding, testing, and release (Patresia et al., 2022). These stages collectively contribute to the effectiveness of the XP methodology in achieving high-quality software development outcomes.

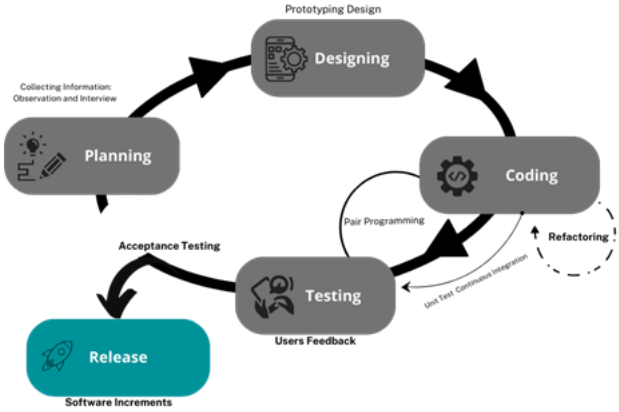

Figure 1. Extreme programming (XP) stages

The development process of MyOnTime encompasses several key stages. It commences with the planning phase, during which observations and interviews are conducted with 20 teachers from various levels at Sekolah Indonesia Kota Kinabalu (SIKK) to identify potential needs for the application, including both features and functionalities for MyOnTime.

The next step is the design phase, which places a strong emphasis on creating a user-friendly interface and ensuring a well-structured user experience. This stage is informed by the results obtained from the earlier observations and interviews.

Moving on to the coding phase, MyOnTime leverages the low-code platform AppSheet for application development. AppSheet, highlighted by Ghammad et al. (2022) is a no-code platform from Google that enables the development of apps and automated processes without requiring traditional coding skills. It achieves this by utilizing data sources like Google Sheets, Excel, Cloud SQL, Salesforce, and other compatible connectors, making it accessible to individuals without programming expertise (Nurharjadmo et al., 2022).

Subsequently, the application undergoes rigorous testing in the testing phase to gather user feedback and ensure its functionality, responsiveness, and reliability. User feedback is a valuable asset in software development, significantly reducing the time spent on adjustments, modifications, and corrections during the development process (Saif et al., 2021). This testing phase involves 20 active teachers from Sekolah Indonesia Kota Kinabalu (SIKK) and includes an online survey using a 5-point Likert scale. Likert scales, as described by South et al. (2022), provide quantitative estimates of subjective traits, aiding in data collection and evaluation.

Finally, once the application has successfully undergone testing and received user feedback, it is ready for release. The release phase occurs when the developed software encompasses all necessary features, meets client expectations, and has no outstanding tasks (Akhtar et al., 2022). This marks the culmination of the development process, with MyOnTime poised to enhance attendance management and streamline administrative tasks at Sekolah Indonesia Kota Kinabalu (SIKK).

Result and Discussion

The application development process of MyOnTime yielded significant outcomes, closely linked to the initial planning and subsequent stages. This discussion will delve into two key aspects: the development of MyOnTime and the results obtained from rigorous testing and user feedback in a comprehensive online survey, which assessed the application's functionality (A), responsiveness (B), and reliability (C)

MyOnTime Development and Testing

Effective software development necessitates teamwork, strong communication skills, and the capability to gather information from diverse sources. It involves ongoing support and collaboration among all stakeholders to identify, implement, and fine-tune modifications and adjustments until the ultimate goal is achieved (Saif et al., 2021). The Agile methodology, which MyOnTime adopts, places a primary focus on continuously evolving customer requirements to provide a more precise and effective tool (Torres et al., 2022). This method is inherently flexible, accommodating changes in requirements, as highlighted by Yin et al. (2023).

The MyOnTime application leverages the benefits of the AppSheet platform, offering the ability to construct an application without the need for coding, eliminating the requirement for an additional database server, and obviating the need to set up a separate website as an editing console (Chou et al., 2023). The utilization of the platform, as advocated by Alamin et al. (2023), streamlines application development with a user-friendly drag-and-drop interface, significantly reducing the need for manual programming.

In the development of the MyOnTime application using Extreme Programming (XP), a meticulous approach was adopted. It commenced with data

observations and interviews involving 20 teachers from SIKK to design a robust application with two access levels: admin and user. The application was carefully crafted to meet specific requirements, ensuring a seamless user experience. These requirements encompassed the creation of a user-friendly interface, the inclusion of comprehensive attendance reporting and analysis features, the implementation of automated attendance recording through barcode scanning, and the promotion of social distancing measures to align with the World Health Organization's (WHO) guidelines (Yang et al., 2020). This comprehensive approach in the application's design demonstrates a commitment to enhancing the overall user experience and aligning with current health guidelines.

MyOnTime development process showcases the successful integration of Agile methodologies, AppSheet platform, and meticulous planning, resulting in an application that is both user-friendly and aligned with the evolving needs and challenges of the educational environment.

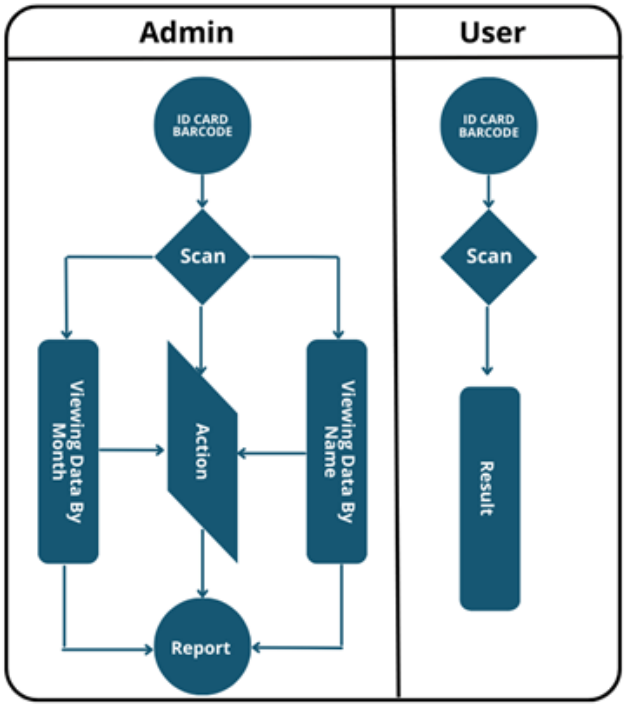

Figure 2. Flowchart MyOnTime for administrator and user

In Figure 2, the application's design prioritizes security and data privacy, with only admin having access to all scanned attendance data, while teachers or users can utilize the scan feature solely for student attendance. To facilitate ease of use, Figures 3 and 4 depict the smartphone scan interface of MyOnTime, automatically activating the barcode scanner for effortless user scanning. This feature enables users to effortlessly obtain detailed information by scanning the card's barcode using a smartphone app as an input device (Agrawal et al., 2021). Moreover, Figure 5 showcases the process of scanning student ID card barcodes from a safe distance of 1 - 1.4 meters, adhering to recommended social distancing guidelines by WHO.

Figure 3. Front Display when scanning barcode

Figure 4. The contents of the front display

Figure 5. The process of scanning students ID card barcode

Figure 6. The result of scanning the barcode

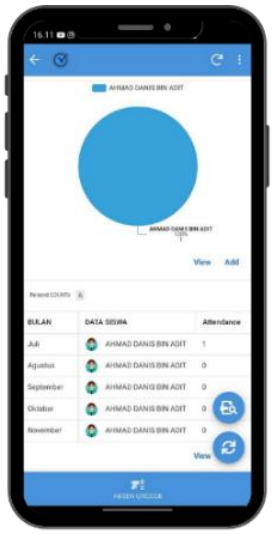

Figure 7. The summarized outcome of scanning for each student every month

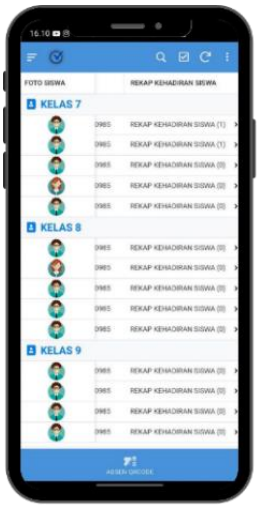

Figure 8. The summarized outcome of scanning all students

Figure 9. Generating a PDF report for each student

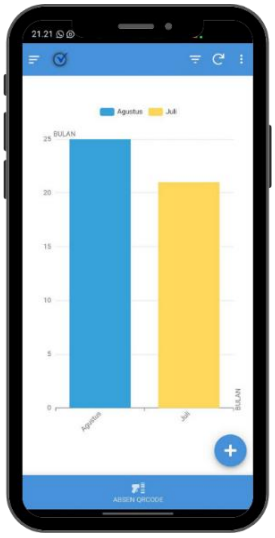

Figure 10. Monthly infographic depicting student attendance

Figure 11. Barcode ID scanning process for students

The effectiveness of the application is demonstrated through the flow of Figure 6, where the validation of students' data from their ID card barcodes is evident. To provide comprehensive insights, Figure 7 presents a summarized outcome of monthly scans using graphical representations and attendance counts for each student. This information can be conveniently saved as a PDF file for individual student data and reports.

Additionally, Figure 8 illustrates the summarized outcome of scanning all students, generating overall student data and reports for enhanced decision-making. Figure 9 showcases the implementation of an eco-friendly approach by generating individualized PDF reports for each student. By doing so, the reliance on paper is reduced, contributing to a sustainable environment. In Figure 10, a monthly infographic is presented, capturing the average attendance of SIKK students per month. This data visualization aids the school in monitoring attendance trends and making informed policy decisions to enhance student engagement. Figure 11 illustrates the efficient process of scanning students ID card barcode, eliminating the need for time-consuming individual calls. This streamlined approach ensures quick and accurate attendance recording, optimizing administrative efficiency and classroom management.

User Feedback: Survey Results

The survey conducted aimed to comprehensively assess MyOnTime, focusing on three crucial aspects: functionality, responsiveness, and reliability. In terms of functionality, participants were surveyed about various features of MyOnTime. The questions covered the user interface, barcode scanning accuracy, attendance reporting capabilities, automation benefits, environmental impact through reduced paper usage, and the promotion of self-distance measures, particularly important in the context of pandemic safety. This section of the survey sought to understand how well MyOnTime met users' needs and expectations in terms of its core features.

The survey also addressed the responsiveness of MyOnTime. This dimension aimed to gauge the support team's efficiency in handling technical issues or inquiries from users. It also examined whether MyOnTime regularly updates its features based on user feedback and evolving needs. Responsiveness is vital in ensuring that users have a positive experience with the application and that any issues or suggestions are promptly addressed, enhancing overall satisfaction.

Furthermore, the survey delved into the reliability of MyOnTime. Participants were asked about the system's consistency in accurately recording attendance without glitches or data loss. Data security and privacy were also assessed to ensure that user data remained confidential and protected within the application. Reliability is paramount to establish trust in the software and guarantee the integrity of attendance records, especially in educational institutions where precise attendance data is crucial for various purposes, including academic evaluations and compliance reporting. Here are the results:

Table 1. The Results of the Online Survey for MyOnTime

Scope	SA	A	N	D	SD
A	80.00%	20.00%	0.00%	0.00%	0.00%
	85.00%	15.00%	0.00%	0.00%	0.00%
	95.00%	5.00%	0.00%	0.00%	0.00%
	90.00%	10.00%	0.00%	0.00%	0.00%
	100.00%	0.00%	0.00%	0.00%	0.00%
	90.00%	10.00%	0.00%	0.00%	0.00%
B	85.00%	15.00%	0.00%	0.00%	0.00%
	80.00%	15.00%	5.00%	0.00%	0.00%
C	90.00%	10.00%	0.00%	0.00%	0.00%
	75.00%	15.00%	10.00%	0.00%	0.00%

The survey findings reveal overwhelmingly positive feedback for MyOnTime in terms of its functionality, responsiveness, and reliability. Users highly appreciate MyOnTime's functionality, with a user-friendly interface garnering 80.0% strongly agreeing and 20.0% agreeing. The barcode scanning feature impresses users, with 85.0% strongly agreeing and 15.0% agreeing. Attendance reporting and analysis features also receive high praise, with 95.0% strongly agreeing and 5.0% agreeing. The attendance recording process is equally lauded, with 90.0% strongly agreeing and 10.0% agreeing. Remarkably, 100.0% of users strongly agree that MyOnTime's paperless approach promotes sustainability.

In terms of responsiveness, users commend the support team's efficiency, with 85.0% strongly agreeing and 15.0% agreeing that issues are promptly addressed. Additionally, 80.0% strongly agree and 15.0% agree that MyOnTime regularly updates and improves features based on user feedback and needs. Regarding reliability, users have full confidence in MyOnTime's performance, with 90.0% strongly agreeing and 10.0% agreeing that attendance recording is consistently accurate. Moreover, 75.0% strongly agree, 15.0% agree, and 10.0% are neutral about the data storage's security, ensuring privacy for all users. Overall, MyOnTime proves to be highly effective, user-centric, and dependable, meeting the needs of students, teachers, and administrative staff while contributing to a more sustainable attendance management system.

Conclusion

MyOnTime, an application that combines Extreme Programming methodology and the AppSheet platform, has successfully provided an effective solution for student attendance management at Sekolah Indonesia Kota Kinabalu (SIKK). The application has proven to be highly functional, responsive to user needs, and reliable in accurately recording attendance. By integrating barcode technology, MyOnTime has reduced administrative workload and enabled users to manage attendance more efficiently. Additionally, the application supports environmentally-friendly practices by reducing paper usage. This conclusion emphasizes that MyOnTime has significant potential to enhance the learning experience by promoting efficiency, convenience, and organizational discipline in attendance management, especially in the post-pandemic learning context.

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Conflicts of Interest
The authors hereby declare that there is no conflict of interest associated with this article.

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