

# Implementation of Online Registration Applications in Vocational High Schools Using the QRCode Method

Asri

*Information Technology Education, Institute of Technology and Business Nobel Indonesia, Indonesia*

## Abstract

The development of information technology has had a significant impact and is applied in various areas of life, including the world of education. The aim of this service is to build and implement an information system that can increase speed and accuracy, as well as minimize errors in manual recording. The service methods used include interviews and literature studies, direct observation, and application design using the Waterfall method which includes needs analysis, system design, implementation, testing and maintenance. Thorough testing of the application is carried out to ensure the functionality, security, speed and reliability of the system. Training on the use of the application is held for teachers, administrative staff, and students to provide in-depth understanding and practical demonstrations. The test results show that the system can run well, while the user response is very satisfied with the online registration application and the training provided. The implementation of this QR code-based application is expected to increase operational efficiency and provide a better experience for prospective students and parents. This initiative is a real step in the digital transformation at SMKN 3 BONE, in line with the increasingly rapid development of information technology, as well as improving the quality of the registration and administration process at the school.

**Keywords:** Information Technology; Education; Student Registration; Digital Transformation; New student.

Received: 15 March 2024

Revised: 29 April 2024

Accepted:30 May 2022

## Introduction

The development of information technology has had a significant impact and is applied in various areas of life, including in the world of education(Farrukh et al., 2023; Kong, 2008). This technology opens up opportunities to increase efficiency(Ahmadi, 2023), accuracy(Gomathi et al., 2023)and the quality of educational services in various institutions, one of which is the 3 BONE Vocational High School (SMKN). The school is a vocational high school located in Belawae, Libureng District, Bone Regency. This school offers six skills programs, namely computer and network engineering, multimedia, electronic engineering, motorbike engineering, light vehicle engineering, and office automation.

Improving the quality of education at SMKN 3 BONE is reflected in the development of facilities and infrastructure that support the teaching and learning process. As part of this effort, the school plans to develop an online application using QR code technology. This initiative aims to build an information system that can facilitate the administrative process, especially in registering new students. This QR code-based information system offers several advantages compared to the manual methods currently used. The use of barcodes in the online registration process will increase speed and accuracy, as well as minimize errors that may occur in manual recording. All data and registration processes for prospective students will be well documented on the official SMKN 3 BONE website.

According to(Hamzah et al., 2023; Ozturkcan & Kitapci, 2023)Innovations such as the use of online applications with QR codes will be adopted more quickly if they are considered to have clear advantages, are compatible with user needs, and are easy to use. The implementation of this technology at SMKN 3 BONE is expected to increase the adoption of technology by students, teachers, and administrative staff because it provides significant advantages in terms of speed and accuracy. This is explained by (Haleem et al., 2023; Torab-Miandoab et al., 2023)that a good information system can help in collecting, storing, processing and distributing information more efficiently. Vygotsky emphasizes that the learning process occurs through social interaction and co-construction between individuals and their social

\*Corresponding author.  
E-mail address: asrinobel@gmail.com (Asri)



environment(Candela, 2024; Salas & Larrain, 2023). In the context of application development, this approach emphasizes the importance of the active participation of all stakeholders, including students, teachers, and parents, in designing, testing, and refining applications to suit local needs and contexts.

The reason for choosing this community service topic is based on the fact that SMKN 3 BONE still uses manual recording methods in its administration process. So by developing this information technology-based application, it is hoped that schools can increase operational efficiency and provide a better experience for prospective students and parents. The use of QR code technology will be a real step in the digital transformation of the SMKN 3 BONE environment, in line with the increasingly rapid development of information technology and improving the quality of the registration and administration process, providing a better experience for users.

## Method

**Community Service Methods** In the context of implementing QR code-based online applications at SMKN 3 BONE, several appropriate community service methods can be used to facilitate the implementation and adoption of this new technology. This method aims to involve all stakeholders such as school principals, teachers, administrative staff and 15 students as respondents to provide feedback on the system implemented. The following are community service methods that can be applied:

**Interviews and Literature Study:** Conduct interviews with various related parties at SMKN 3 BONE, such as school principals, teachers, and administrative staff to understand the needs, challenges, and expectations regarding the implementation of online applications. Apart from that, conduct literature studies on the implementation of similar technology in other schools to gain insight and best practices.

**Observation:** Conduct direct observations of the administration and student registration process at SMKN 3 BONE to understand in detail how the process takes place, and identify problems, and potential improvements that can be made through the online application.

**Application Design using the Waterfall Method:** Applying the Waterfall software development method to design QR code-based online applications. Steps in the Waterfall method, such as requirements analysis, system design, implementation, testing, and maintenance, will be carried out systematically to ensure applications can be developed according to user needs and expectations.(Fadilah et al., 2023; Iskandar et al., 2023).

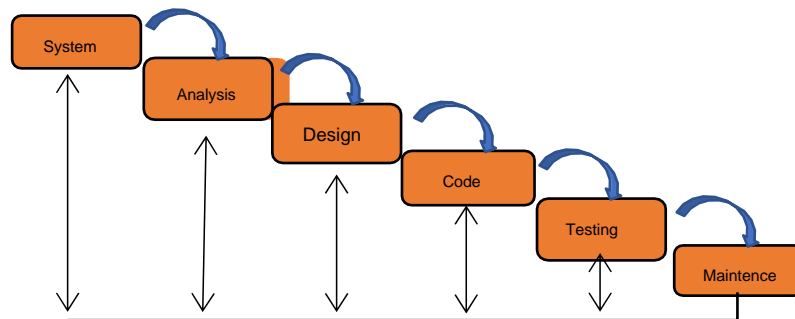


Figure 1. Waterfall method

**System Testing:** Conduct thorough testing of online applications before the official launch. This testing includes functionality, security, speed, and system reliability tests to ensure that the application can operate properly and meet established quality standards.

**Application Usage Training:** Holding a simple seminar for teachers and administrative staff at SMKN 3 BONE to provide an in-depth understanding of the use of QR code-based online applications. This training may also include practical demonstrations of how to use the application, common problem-solving, and tips and tricks for maximizing the benefits of the application.

By implementing a holistic and integrated community service method, it is hoped that the implementation of the QR code-based online application at SMKN 3 BONE can run smoothly and receive full support from the entire school community. This step will also help ensure that the new technology can truly provide maximum benefits in improving the efficiency and quality of educational services in schools.

## Results and Discussion

The design of a QR code-based online application system was carried out using the Waterfall method (Gunawan et al., 2023). As the design process progressed, the main focus was given to ensuring that the application was able to meet the needs of the school administration, especially in the new student registration process. In the face of rapid advances in information technology, educational institutions now need computerized information systems to carry out all their activities. This need arises because of the many advantages that computerized systems have when compared to manual methods. Overcoming challenges at SMK 3 Bone requires the development of an online registration system that uses QR codes. The following is documentation about the system and the implementation of community service activities that have been carried out.

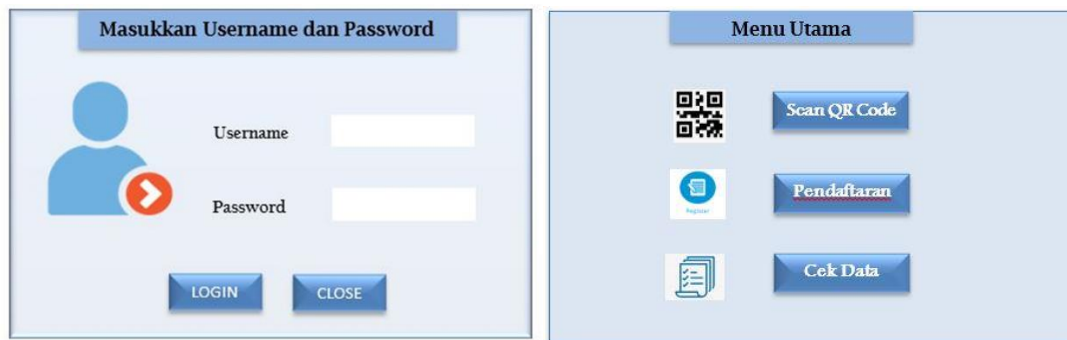


Figure 2. Online registration application



Figure 3. Training on Using the Online Registration Application

Based on the results of data analysis carried out by asking for responses from 15 respondents to the new student admission application, it showed high satisfaction based on the results of descriptive statistical analysis in the form of Very Satisfied percentages of 60%, Satisfied: 33.33%, Dissatisfied: 6.67%. Meanwhile, training on application use also received a very positive response with a very satisfied percentage of 53.33%, 40% satisfied, and 6.67% dissatisfied. This shows that the application has been successfully developed and is operating as expected. Positive responses from users show that this application provides added value in the efficiency and quality of educational services at SMKN 3 BONE. The involvement of various stakeholders in the design and testing process has provided satisfactory results, showing that this application meets user needs and expectations.

Based on the results of comprehensive system testing, the QR code-based online application at SMKN 3 BONE has been proven to meet the specified quality standards. This testing covers aspects of application functionality, security, speed, and reliability. The application is capable of carrying out all expected functions, such as new student registration and data verification, with an adequate level of security to protect student information. In addition, this application shows a fast response in processing transactions and has a high level of reliability with minimal interruptions or errors.

Positive responses came from various stakeholders, including school principals, teachers, administrative staff and students. School principals welcome this application because it can increase the efficiency and accuracy of the new student registration process. Teachers appreciate the ease of use of the application which reduces their administrative burden, while administrative staff feel that this application is very helpful in reducing manual recording errors and speeding up the student data verification process. Students also feel helped by this application because it makes the registration process easier and gives a modern impression.

The results of the service show that the development of a QR code-based online application at SMKN 3 BONE has succeeded in achieving the expected goals. Some important discussion points from these results are the advantages of QR code technology, which has proven effective in speeding up the registration process and reducing manual errors. Innovation adoption theory from (Hmoud et al., 2023; Khan et al., 2023) supports these findings, stating that new technologies that are perceived to have clear advantages and are compatible with user needs will be adopted more quickly. Additionally, comprehensive and practical training proved essential to ensure that all users were able to get the most out of the application. This is in line with Vygotsky's learning theory, which emphasizes the importance of social interaction and active participation in the learning process (Almazroui, 2023; Boye & Agyei, 2023).

Active involvement of all stakeholders, including principals, teachers, administrative staff, and students, is essential to ensure the success of this program. Their participation in design, testing, and training increases acceptance and adoption of this new technology. Program sustainability is also an important factor in ensuring long-term success, requiring ongoing support in the form of regular training, system maintenance, and feature updates as needs evolve. This approach is supported by change management theory which emphasizes the importance of ongoing support and adaptation to change for successful technology implementation.

Overall, the implementation of a QR code-based online application at SMKN 3 BONE not only increases the efficiency and accuracy of the new student registration process but also shows how technology can be used to improve the quality of educational services. It is hoped that this success can become a model for other schools that wish to adopt similar technology, showing the importance of careful planning, effective training, and the involvement of all stakeholders in the technology adoption process.

The importance of online registration applications at Vocational High Schools (SMK) cannot be ignored in the current digital era. This application offers a variety of significant benefits, including increased efficiency and accuracy in the new student registration process. By adopting an online system, schools can reduce dependence on manual recording methods which are prone to errors and take longer. In addition, online registration applications allow for more structured and easily accessible data storage, which is very helpful in managing school administration. The security of student data can also be further guaranteed through security features integrated into the application.

The use of technology such as QR codes in this application also provides additional convenience in data verification, speeds up the process, and reduces long queues during the registration period. Overall, online registration applications not only increase school operational efficiency, but also provide a better and more modern experience for prospective students and parents, and help schools keep up with the increasingly rapid development of information technology.

## **Conclusions**

The development and implementation of a QR code-based online application at SMKN 3 BONE has succeeded in increasing the efficiency and accuracy of the new student registration process. The very satisfied user response shows that the application and training provided meet their needs and expectations. This initiative not only helps in the digital transformation of the school environment but also improves the quality of educational services provided. It is hoped that this success can become a model for other schools that want to adopt similar technology.

**Acknowledgments:** We would like to thank all parties who have contributed to the success of this community service program at SMKN 3 BONE. Especially to the Principal of SMKN 3 BONE, who has provided full support and opened the door for the implementation of this program. Thanks also to the teachers and administrative staff who actively participated in testing and training the application, and provided valuable input that helped improve the system.

## References

- Ahmadi, S. (2023). Open AI and its Impact on Fraud Detection in Financial Industry. *Journal of Knowledge Learning and Science Technology*, 2959–6386. <https://doi.org/https://doi.org/10.60087/jklst.vol2.n3.p281>
- Almazroui, K. M. (2023). Project-based learning for 21st-century skills: An overview and case study of moral education in the UAE. *The Social Studies*, 114(3), 125–136. <https://doi.org/https://doi.org/10.1080/00377996.2022.2134281>
- Boye, E. S., & Agyei, D. D. (2023). Effectiveness of problem-based learning strategies in improving teaching and learning of mathematics for pre-service teachers in Ghana. *Social Sciences & Humanities Open*, 7(1), 100453. <https://doi.org/https://doi.org/10.1016/j.ssaho.2023.100453>
- Candela, A. (2024). Discursive Interaction and Construction of Science in the Classroom. In *Science Teaching and a New Teacher Culture: Challenges and Opportunities* (pp. 29–40). Springer. [https://doi.org/https://doi.org/10.1007/978-3-031-50004-6\\_2](https://doi.org/https://doi.org/10.1007/978-3-031-50004-6_2)
- Fadilah, MI, Kusumasari, TF, & Suakanto, S. (2023). Implementation of MVC Architecture on RESTful API for Monitoring Covid-19 Patient Condition Parameters using Laravel Framework with Waterfall Method. *International Conference on Enterprise and Industrial Systems (ICOEINS 2023)*, 258–270. [https://doi.org/10.2991/978-94-6463-340-5\\_23](https://doi.org/10.2991/978-94-6463-340-5_23)
- Farrukh, M., Soomro, T.R., Ghazal, T.M., Alzoubi, H.M., & Alshurideh, M. (2023). Perspectives of online education in Pakistan: Post-covid scenario. In *The Effect of Information Technology on Business and Marketing Intelligence Systems* (pp. 519–550). Springer. [https://doi.org/https://doi.org/10.1007/978-3-031-12382-5\\_28](https://doi.org/https://doi.org/10.1007/978-3-031-12382-5_28)
- Gomathi, L., Mishra, A.K., & Tyagi, A.K. (2023). Industry 5.0 for healthcare 5.0: Opportunities, challenges and future research possibilities. *2023 7th International Conference on Trends in Electronics and Informatics (ICOEI)*, 204–213. <https://doi.org/10.1109/ICOEI56765.2023.10125660>
- Gunawan, AAS, Clemons, B., Halim, IF, Anderson, K., & Adianti, MP (2023). Development of e-butler: Introduction of robot system in hospitality with mobile application. *Procedia Computer Science*, 216, 67–76. <https://doi.org/https://doi.org/10.1016/j.procs.2022.12.112>
- Haleem, A., Javaid, M., Singh, R.P., Suman, R., & Khan, S. (2023). Management 4.0: Concept, applications and advancements. *Sustainable Operations and Computers*, 4, 10–21. <https://doi.org/https://doi.org/10.1016/j.susoc.2022.10.002>
- Hamzah, MI, Ramli, FAA, & Shaw, N. (2023). The moderating influence of brand image on consumers' adoption of QR-code e-wallets. *Journal of Retailing and Consumer Services*, 73, 103326. <https://doi.org/https://doi.org/10.1016/j.jretconser.2023.103326>
- Hmoud, H., Al-Adwan, A.S., Horani, O., Yaseen, H., & Al Zoubi, J.Z. (2023). Factors influencing business intelligence adoption by higher education institutions. *Journal of Open Innovation: Technology, Market, and Complexity*, 9(3), 100111. <https://doi.org/https://doi.org/10.1016/j.joitmc.2023.100111>
- Iskandar, A., Mansyur, M., Ahmar, AS, Rahman, A., & others. (2023). Android-Based E-Learning Application Design in Schools. *Journal of Applied Science, Engineering, Technology, and Education*, 5(1), 1–7. <https://doi.org/https://doi.org/10.35877/454RI.asci1643>
- Khan, M.I., Asfand, F., & Al-Ghamdi, S.G. (2023). Progress in research and technological advances of commercial concentrated solar thermal power plants. *Solar Energy*, 249, 183–226. <https://doi.org/https://doi.org/10.1016/j.solener.2022.10.041>
- Kong, S. C. (2008). A curriculum framework for implementing information technology in school education to foster information literacy. *Computers & Education*, 51(1), 129–141. <https://doi.org/https://doi.org/10.1016/j.compedu.2007.04.005>
- Ozturkcan, S., & Kitapci, O. (2023). A sustainable solution for the hospitality industry: The QR code menus. *Journal of Information Technology Teaching Cases*, 20438869231181600. <https://doi.org/https://doi.org/10.1177/23197145231176951>

- Salas, M. H., & Larrain, A. (2023). A holistic theorization of the developmental potential of peer dialogue: revisiting Vygotsky. *European Journal of Psychology of Education*, 1–17. <https://doi.org/https://doi.org/10.1007/s10212-023-00730-4>
- Torab-Miandoab, A., Samad-Soltani, T., Jodati, A., & Rezaei-Hachesu, P. (2023). Interoperability of heterogeneous health information systems: a systematic literature review. *BMC Medical Informatics and Decision Making*, 23(1), 18. <https://doi.org/https://doi.org/10.1186/s12911-023-02115-5>