International Journal of Computer Sciences and Mathematics Engineering Vol. 2 No. 2 (2023)
Published by: CV. HAWARI

International Journal of Computer Sciences and Mathematics Engineering
Journal homepage: www.ijecom.org

QR Code Generator Application To Access Information On The Campus Building

Sri Wahyuni[1], Akhyar Lubis[2], Annisa Ferbina Br.Purba[3]
[1,2,3]Department of Computer Engineering, Universitas Pembangunan Panca Budi, Indonesia

Article Info

Article history:

Received Nov 19, 2023
Revised Nov 22, 2023
Accepted Nov 27, 2023

Keywords:

Campus
Camera Scanner
Qr Code Generator

ABSTRACT

The purpose of this research is to create and develop an application for creating QR codes that may be used to retrieve data about campus structures. Users only need to use their phone's camera to scan a QR code to obtain information immediately. Visitors to campus will find a wealth of information regarding school buildings, including location maps, a list of amenities, and emergency contacts. Java programming was used on the Android Studio platform to create this application. Building-related information is kept in the Firebase Realtime Database. A database-connected website interface allows administrators to manage data. The application for creating QR codes has been successful in producing dynamic codes with details about specific campus structures. Field testing demonstrates that the application functions properly. Buildings can have their QR codes scanned by users to view comprehensive building information. This application can be used in any section of the campus buildings to give guests immediate access to information. Tests for this study were conducted at Universitas Pembangunan Panca Budi.

Corresponding Author:

Akhyar Lubis,
Department of Computer Engineering,
Universitas Pembangunan Panca Budi,
Jl. Jend. Gatot Subroto Km. 4,5 Sei Sikambing 20122 Medan, Propinsi Sumatera Utara, Indonesia.
Email: akhyarlbs@pancabudi.ac.id

1. INTRODUCTION

Universitas Pembangunan Panca Budi is home to numerous structures for a variety of purposes, including offices, labs, libraries, classrooms, and other support spaces. These buildings can occasionally be challenging to locate, especially for new students and those making their first visit to Universitas Pembangunan Panca Budi during an event that is open to the public. Visitors can benefit greatly from information such as building site plans, a list of facilities, and vital contacts. Not every facility, though, has this information readily available. Technology can be used as a solution to difficulties in accessing the information needed [1][1,2,3,4]. With the use of only a smartphone camera and QR (Quick Response) code technology [6], digital information may be rapidly stored and accessible [7]. These days, QR codes are widely utilised in a wide range of goods and apps to quickly and easily tell users about goods or other items [8].You need an instrument known as a scanner in

E-ISSN 2962-4274

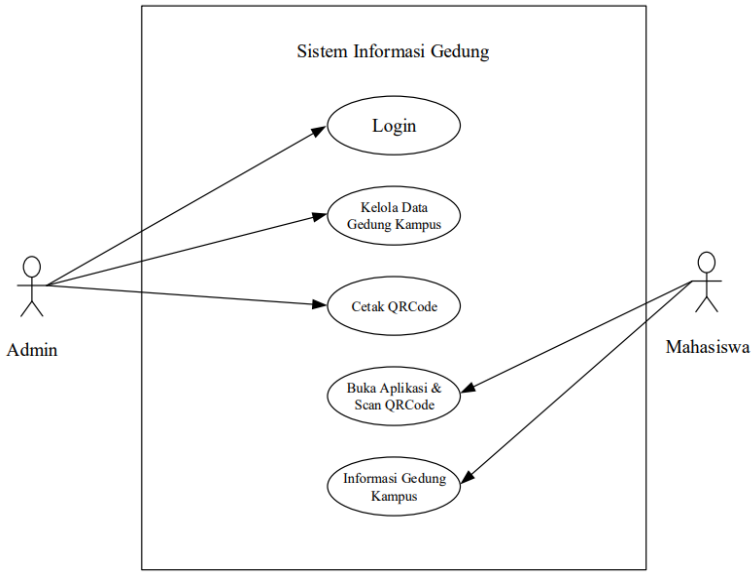
order to read product information. You can currently use your Android smartphone as a scanner. Scanner is a free Android application that uses the phone's camera to automatically scan and recognise data from one- and two-dimensional QR codes. It can decode or read information from a QR code in both dimensions. For this reason, the author wants to create a widely utilised QR code technology for products in order to identify development-related information. campus structures at universities with five minds [7,8,9]. It has become common practice to use QR codes to offer information about public spaces like museums and tourism destinations [12]. Nonetheless, comparable apps for obtaining building data within a university setting are still hardly used [1].
The purpose of this project is to design and develop an Android application that can produce distinct QR codes for every Universitas Pembangunan Panca Budi building. Visitors can instantly view comprehensive information on the building on their smartphone by scanning the QR code, which can be placed in strategic locations throughout each structure [13]. Administrators may quickly manage and update the information without having to replace the QR codes that are currently in use because it is saved in a real-time database [14]. It is intended that this QR code-based information system will become a new innovation in the application of QR code technology and offer visitors to the campus simple access to information. There is a chance that the research items can be used in different building situations [15][16][17].

2. RESEARCH METHOD

During this process, looking for information about buildings on campus is done by looking for information from the admin or related parties on campus. This will take quite a long time, because it requires a lot of energy & time to get this information. So, to speed up the time in getting information about campus buildings, the researchers used QRcode which utilizes students' smartphones as a medium for reading the QRcode. The concept that will be built into the QRcode scan application to obtain campus building information is that the admin will input data on campus buildings such as building names/codes, images, building uses. To get this information, students only need to scan the building QRcode that has been provided.

2.1 Use Case Diagrams

The following is the use case diagram of the goods inventory system and service transactions on CV. Engineering Field



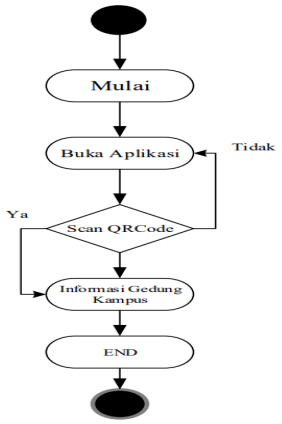
Fgure 1. Use Case Diagram

E-ISSN 2962-4274

In picture 1. above, students go to the campus building and open the application, then scan the building's QR Code to find out information about the campus building. After successfully scanning the QR Code, the student will immediately be redirected to information about the campus building.

2.2 Actifity Diagrams

The activity diagram below describes the process that runs on campus building information. After visiting the building, students can scan the QRcode, which can be seen in the figure 2.



Fgure 2. Admin Activity Diagrams

In Figure 2 above, the first process that is carried out is to start then come to the campus building and open the application and scan the building's QRCode. If the scanning process doesn't work then return to the scan page. If the QRCode scanning process continues then it will then read validation from the building's QRCode and enter. to information about the campus building.

2.3 Sequence Diagram

Sequence Diagram design of this web-based inventory information system can be seen in the following figure:

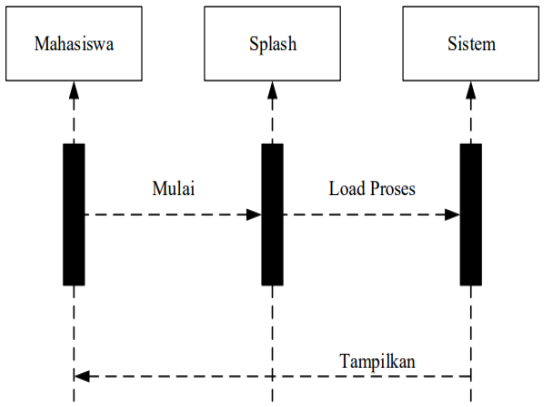


Figure 3. Sequence Diagram

E-ISSN 2962-4274

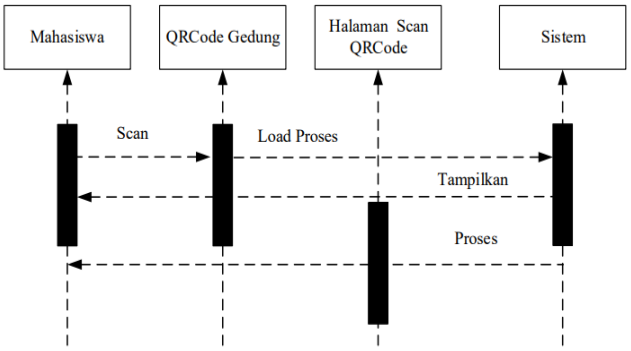


Figure 4. Sequence Diagram

2.4 Class Diagram

Class Diagram describes the structure of static objects in a system, showing what classes the system is composed of and what relationships are formed between these classes.

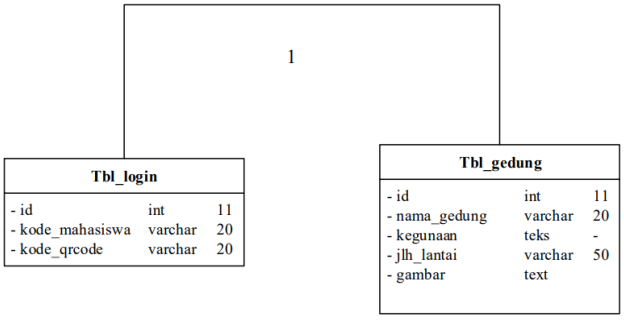


Figure 5. Class Diagram

3. RESULTS AND DISCUSSIONS

the results of application design and testing carried out on systems that have been completed and can be used. The result of the system created is an implementation application for scanning QRcode information on Panca Budi Development University campus buildings. The running application is very useful in scanning QR Codes by utilizing the help of the internet network, making it easier for users to scan QR Codes using a smartphone. The results display and implementation of the resulting application can be explained as follows:

3.1. Admin view

The login menu interface displays several pages provided for admins to enter the admin page by entering the login code and password so they can enter the main page on the admin page

E-ISSN 2962-4274

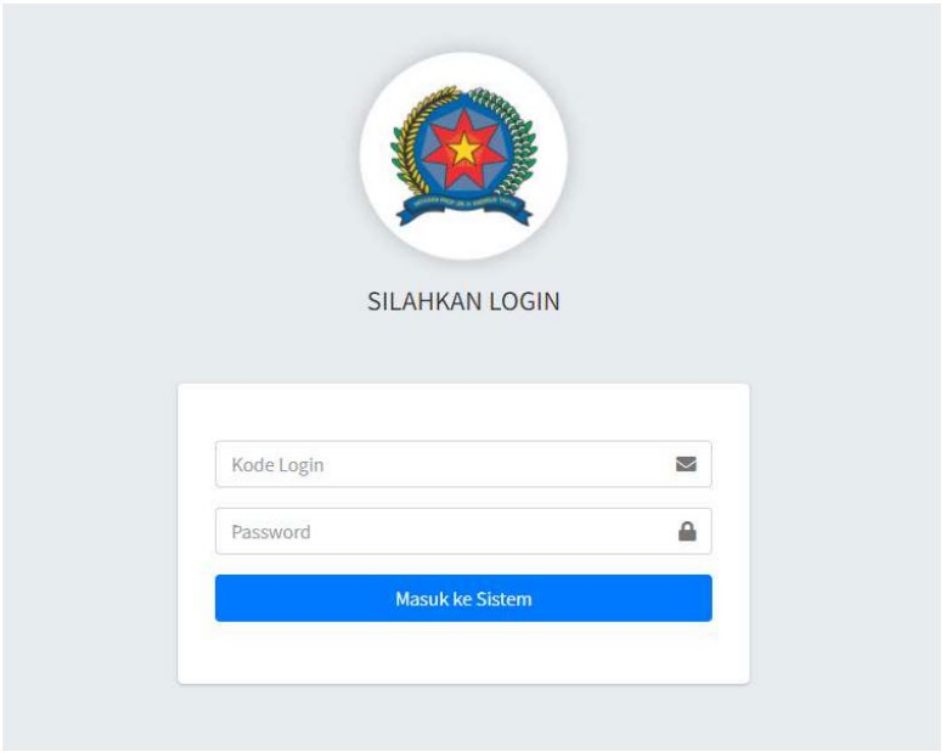


Figure 6. Login Page

admin login process, admin must enter the login code and password to be able to access the main page on the admin page.

3.2. Home Page

After the login process is successful, the admin will then be directed to the main page, on the main page there is a building data menu that can be selected to input game data.

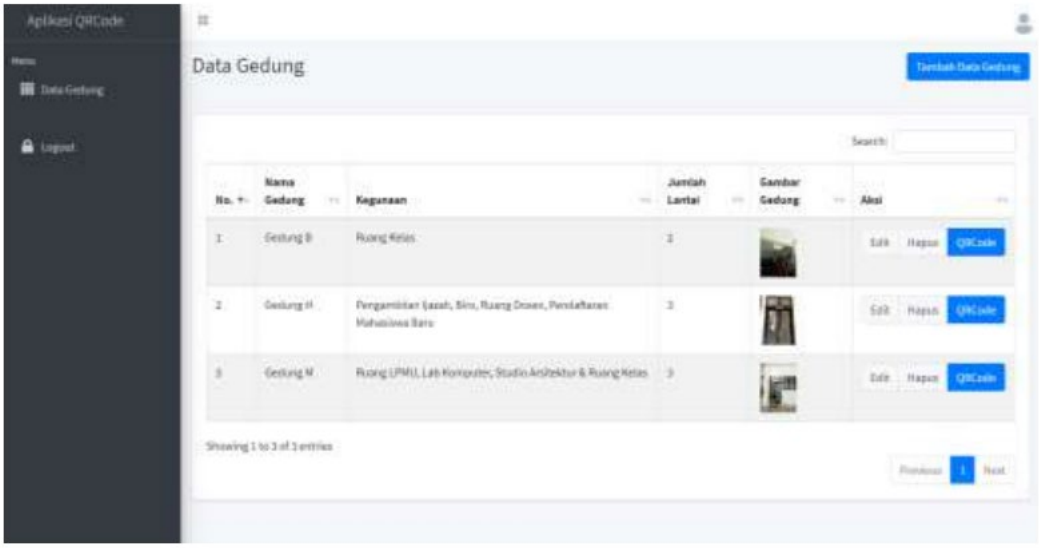


Figure 7. Home Page

E-ISSN 2962-4274

3.3 Interface Add Building Data Page

Halaman tambah data gedung digunakan untuk menginput data gedung, selain itu halaman data gedung dijadikan untuk membuat QRCode informasi tentang gedung yang akan digunakan untuk proses scan QRCode pada aplikasi.

Figure 7. Home Page

Page Interface Added to the building data page, the admin must fill in the details to get information about the building, the complete data that must be input is: building name, use, number of floors, building image, building QR code, Building data.

3.4 Application Splash Page Interface

The splash page interface displays a university icon and when clicked it will immediately direct you to scan the building's QR Code. For more details, the results can be seen in the Figure 8

E-ISSN 2962-4274

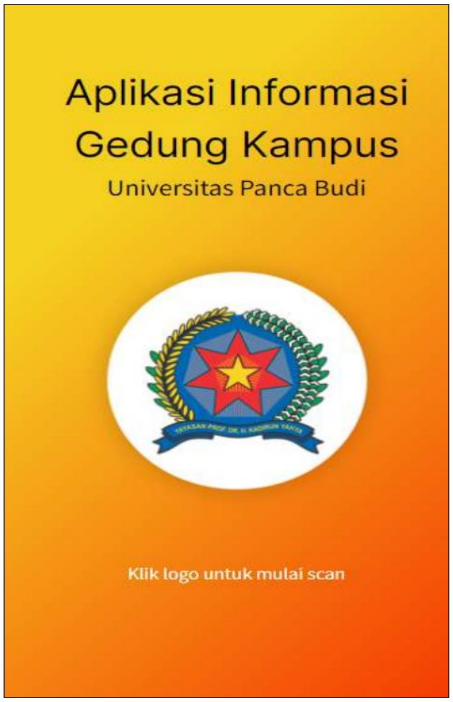


Figure 8. Application Splash Page Interface

3.5 Scan QRcode Application Page

This page gives users access to relevant data, such as the name of the item, the amount of stock available, the minimum or maximum limit, as well as other information related to the stock of the item.

Figure 9. Scan QRcode Application Page

E-ISSN 2962-4274

3.6 Building Information Page

The building information page interface displays information about the scanned QRcode of the building and there is information in the form of the name of the building, use of the building, number of floors and image of the building. For more details, the results can be seen in the picture This page provides users with easy access to track purchases that occur, analyze expenses, evaluate vendor.

Figure 10. Building Information Page

4. CONCLUSION

The conclusion is a summary of all the research results that have been carried out carried out by the author, several conclusions that are useful in the future for development and input for readers and writers themselves. As for The conclusions obtained from this research can be explained as follows:

1. By adjusting the needs and objectives of the system, conclusions can be drawnm that the development carried out for a tool that can scan QRcode using an Android mobile phone device is very possible for users, making it easier for users to run it.
2. The development of this QR Code scanning system produces a powerful application that is easily run by users.
3. Java programming can be implemented in various forms of system support, this research produces an Android mobile phone based application, the Android Studio editor for Android application development.

ACKNOWLEDGEMENTS

Thanks are extended to the Universitas Pembangunan Panca Budi in particular the UNPAB Research Institute and Study Center and the UNPAB National and International Journal Affairs Institute for recording this research and publication.

E-ISSN 2962-4274

REFERENCES

[1] E. Budhiarti Nababan and O. S. Sitompul, "The Determination of Spc Location Using Fuzzy Technique and Transition Probability," *nd Reg. Conf. Appl. Eng. Math.*, no. July 2016, 2012.

[2] S. Wahyuni, D. J. Sari, H. Hernawaty, and N. Afifah, "TERNAKLOKA: A WEB-BASED MARKETPLACE FOR QURBAN AND AQIQAH," *JURTEKSI (Jurnal Teknol. dan Sist. Informasi)*, vol. 9, no. 2, pp. 249–254, 2023.

[3] S. Wahyuni, kana S. Saragih, and M. I. Perangin-angin, "Implemntasi Metode Decision Tree C4.5 Untuk Menganalisa Mahasiswa Dop Out," *ethos*, vol. 6, no. 1, pp. 42–51, 2018.

[4] C. Rizal, S. R. Siregar, S. Supiyandi, S. Armasari, and A. Karim, "Penerapan Metode Weighted Product (WP) Dalam Keputusan Rekomendasi Pemilihan Manager Penjualan," *Build. Informatics, Technol. Sci.*, vol. 3, no. 3, pp. 312–316, 2021.

[5] A. Khaliq and S. N. Sari, "PEMANFAATAN KERANGKA KERJA INVESTIGASI FORENSIK JARINGAN UNTUK IDENTIFIKASI SERANGAN JARINGAN MENGGUNAKAN SISTEM DETEKSI INTRUSI (IDS)," *J. Nas. Teknol. Komput.*, vol. 2, no. 3, pp. 150–158, 2022.

[6] E. B. Nababan and O. S. Sitompul, "Genetic algorithms dynamic population size with cloning in solving traveling salesman problem," *Data Sci. J. Comput. Appl. Informatics*, vol. 2, no. 2, pp. 87–100, 2018.

[7] S. Wahyuni and F. Wadly, "Application Of Inventory And Service Transactions On Web-Based Cv Medan Teknik using the Agile Kanban Method," *Int. J. Comput. Sci. Math. Eng.*, vol. 2, no. 1, 2023.

[8] S. Wahyuni, O. S. Sitompul, E. B. Nababan, and P. Sihombing, "Social Network Analysis Text Mining on Networks Publication Citation," in *2021 International Conference on Data Science, Artificial Intelligence, and Business Analytics (DATABIA)*, 2021, pp. 35–39.

[9] A. Akbar, I. Sulistianingsih, H. Kurniawan, and R. D. Putri, "Rancangan Sistem Pencatatan Digital Sensus Penduduk (Sensudes) Berbasis Web di Desa Kota Pari," *Brahmana J. Penerapan Kecerdasan Buatan*, vol. 4, no. 1A, pp. 23–27, 2022.

[10] I. Sulistianingsih, S. Suherman, and E. Pane, "Aplikasi Peringatan Dini Cuaca Menggunakan Running Text Berbasis Android," *IT J. Res. Dev.*, vol. 3, no. 2, pp. 76–83, 2019.

[11] C. Rizal, S. Supiyandi, M. Zen, and M. Eka, "Perancangan Server Kantor Desa Tomuan Holbung Berbasis Client Server," *Bull. Inf. Technol.*, vol. 3, no. 1, pp. 27–33, 2022.

[12] A. P. Rajangeran, P. S. Sekaran, F. Sidi, S. R. Hairani, M. F. Daud, and R. Razak, "A STUDY ON PHYSICAL ACCESS CONTROL USING QR CODE AS VIRTUAL IDENTIFICATION SYSTEM FOR DOOR ACCESS CONTROL," in *INTERNATIONAL SYMPOSIUM ON ICT MANAGEMENT AND ADMINISTRATION (ISICTMA2019)*, 2019, p. 39.

[13] T. Lestariningsih *et al.*, "Implementation of Industrial 4.0 library based on mobile using QR-code," in *Journal of Physics: Conference Series*, 2021, vol. 1845, no. 1, p. 12011.

[14] T. P. Truong and L. T. Le, "QR Code Application in Tree Management: A Pilot Project," in *Proceedings of the 2023 12th International Conference on Software and Computer Applications*, 2023, pp. 83–88.

[15] A. Sutedjo and I. K. Wardani, "Strategi Pengembangan Objek Wisata Gunung Beruk Sebagai Wisata Berbasis Masyarakat di Desa Karangpatihan Kecamatan Balong Kabupaten Ponorogo," *Swara Bhumi*, vol. 5, no. 2, pp. 26–32, 2017.

[16] hermansyah, "Perancangan Aplikasi Pembelajaran Interaktif Pengenalan Unsur Kimia dengan Metode Computer Based Instruction (CBI)," vol. 9, no. 3, pp. 74–78, 2021.

[17] O. S. Sitompul and E. B. Nababan, "Biased support vector machine and weighted-smote in handling class imbalance problem," 2018.