Journal of Innovation and Computer Science (JICS)
Vol. 2, No. 1, October 2025
https://journal.itqanpreneurs.com/index.php/jics/index

Designing a Web-Based Zakat Calculator Using Streamlit: A Case Study of BAZNAS Banyumas Regency

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Article History:
Received: 23-09-2025
Revised: 17-11-2025
Accepted: 18-11-2025

Keywords:
Zakat, Web Application, Streamlit, Python, BAZNAS Banyumas.

How to Cite:
Mujahid, R. F. ., & Kusuma, M. R. . (2025). Designing a Web-Based Zakat Calculator Using Streamlit: A Case Study of BAZNAS Banyumas Regency. *Journal of Innovation and Computer Science*, *2*(1), 39–45. https://doi.org/10.57053/jics.v2i1.137

Abstract: *Zakat is an important instrument for distributing welfare among Muslims and requires accurate and transparent calculations. However, some people still have difficulty calculating zakat on their income independently. This study aims to design and implement a web-based Zakat Calculator application using the Streamlit framework, with a case study at the National Zakat Agency (BAZNAS) in Banyumas Regency. This application features an interactive interface, automatic calculations based on the current gold nishab, and flexible additional income features. The research method uses a Design Science Research (DSR) approach, with the following stages: problem identification, artifact design, implementation, and evaluation. The implementation results show that the application can facilitate muzaki (payers of zakat) in calculating zakat obligations quickly and accurately, and provides user-friendly information on the status of their obligations. This application also supports transparency in zakat collection at the regional level.*

Introduction

Zakat holds a crucial position as an instrument of social justice and a sharia obligation for Muslims. In Indonesia, the National Zakat Agency (BAZNAS) plays a central role in managing zakat, infaq, and alms (ZIS). One of the challenges still faced by the community is the difficulty in calculating the amount of zakat, particularly income zakat (professional zakat), as this calculation requires knowledge of the nishab (minimum threshold), the zakat rate, and applicable sharia provisions. This lack of understanding leads some zakat payers to hesitate in determining their zakat obligations.

In the context of digitalizing public services, the Banyumas Regency BAZNAS (National Zakat Agency) is striving to provide technology-based solutions to simplify the calculation of zakat obligations for those who pay zakat. As part of the transformation of ZIS services, a Streamlit-based Zakat Calculator application has been developed and is easily accessible on both computers and mobile devices. This application is expected to provide a faster, more accurate, and more easily understood means of education and zakat calculation for the public.

Although various digital platforms exist to support zakat education and payment, there remains a gap between user needs and the availability of simple, standardized, and easily accessible applications at the regional level. Many people still do not understand how to calculate the nishab based on current gold prices and are unfamiliar with general zakat applications that are not integrated with local needs. This highlights the need for innovative applications that not only calculate zakat but also provide contextual information in accordance with Sharia law and regional characteristics.

The development of Python technology and the Streamlit framework opens new opportunities for creating lightweight, interactive, and rapidly scalable web applications. However, to date, there has been little research utilizing Streamlit as a web-based zakat

calculator platform specifically designed to support BAZNAS operations at the district level. This research helps fill this gap by designing a user-friendly zakat calculator application, standardized on the latest gold nishab, and supporting zakat transparency and literacy in the community. Thus, this research not only provides a practical solution for muzaki (payers of zakat) but also strengthens efforts to digitize ZIS management at BAZNAS Banyumas Regency.

Method

Several previous studies have examined the use of technology in zakat calculations. Hasanah (2020) emphasized the importance of web-based systems for improving zakat literacy in the community. Meanwhile, Wulandari & Rahmawati (2021) developed an Android-based zakat application, but it was limited to calculation simulations. In the context of methodology, Design Science Research (DSR) is the primary approach in information systems research because it bridges practical problems and technological solutions (Hevner et al., 2004). Streamlit was chosen as a Python framework because it supports fast and simple interactive application development (Streamlit Inc., 2023). With this combination, the research aims to provide practical, accessible solutions, particularly at the local level.

Besides the framework, the programming language used is also a crucial element. Python is known as a versatile programming language with simple syntax, high readability, and a broad library ecosystem for scientific computing and web application development (Van Rossum & Drake, 2009; Oliphant, 2007). Python's advantages in terms of flexibility, productivity, and large developer community make it one of the most widely used languages in information systems research and development. Python consists of four elements: first, identification of problems. People have difficulty calculating zakat correctly. There is no simple, user-friendly zakat application available at the regional level yet.

The second, Artifact Design. Interactive interface design using Streamlit. Implementation of the sharia zakat formula (2.5% of total income if it reaches the nishab). A dynamic input feature to add extra income. The third, System Implementation. Programming language: Python. Python was chosen for its simple, flexible syntax and extensive library support, including NumPy and Pandas. Python also supports interactive web application development with the Streamlit framework, enabling rapid, efficient implementation of zakat calculators. Framework: Streamlit. This framework was chosen because it supports the creation of interactive web interfaces with concise code, simplifies the prototyping process, and allows applications to run directly in the browser. Main features: income input, automatic calculation, mandatory/non-mandatory zakat status, link to the BAZNAS Banyumas digital payment channel. The fourth, Evaluation. The trial was conducted with internal users of BAZNAS Banyumas Regency, using the following evaluation parameters: Ease of use, Calculation speed, and Clarity of information.

Result and Discussion

Application Features

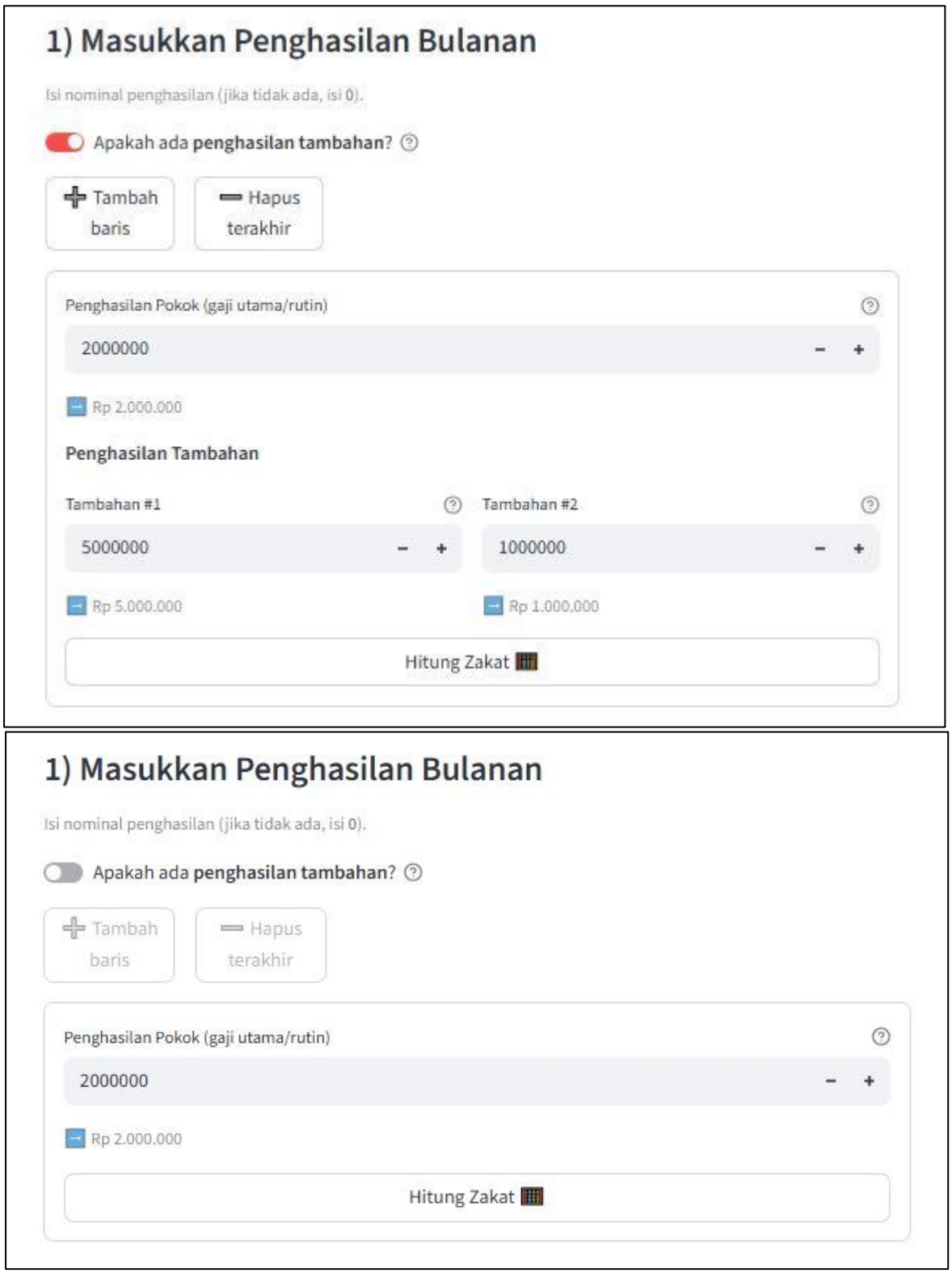
The Application Feature can be described as follows. The first, Dynamic Income Input. Users can add or delete additional income lines as needed—the second, Automatic Calculation. The system calculates total income, compares it with the nishab (price of 85 grams of gold), and displays the zakat amount of 2.5%. Then, the third, User Friendly Notifications. The application displays the mandatory zakat status with different icons and colors (✅ green for mandatory, ℹ️ blue for not yet mandatory). Ultimately, the fourth is Information Integration. The official link to the BAZNAS Banyumas account and website

is available for users to pay zakat directly.

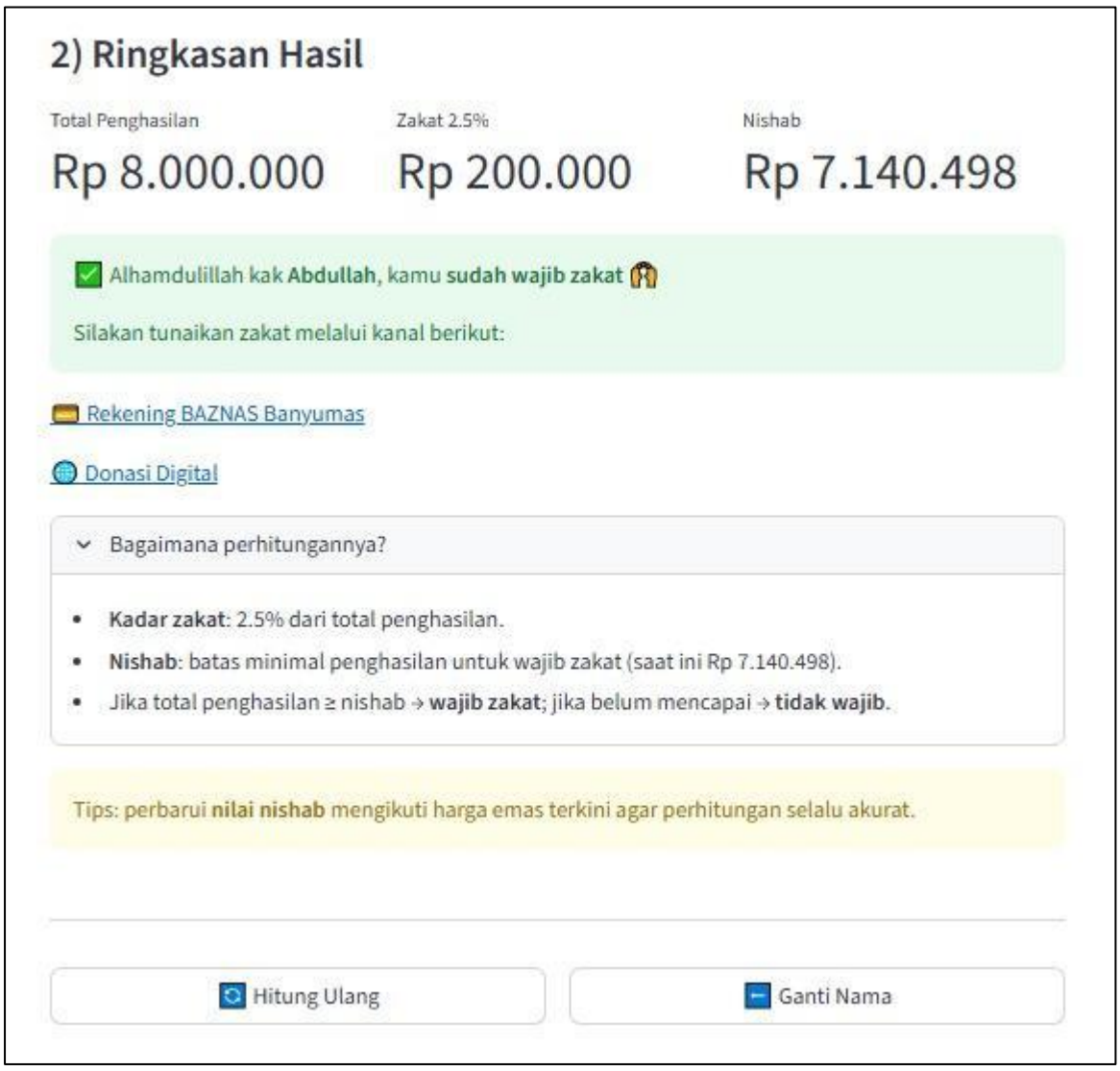
Application View

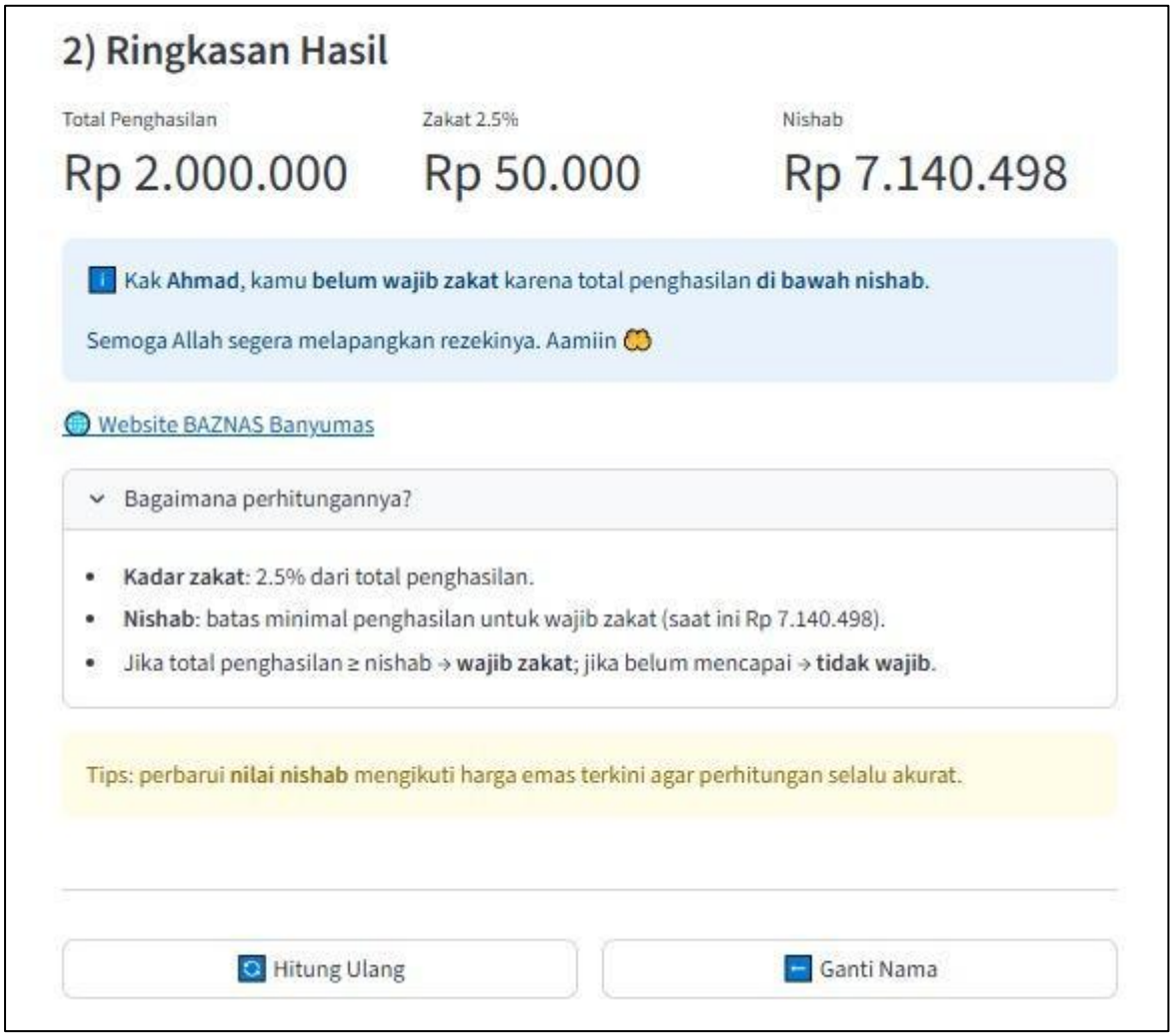
1. Interactive Visual Interface using Streamlit

Dynamic Income Input



2. Automatic Calculations, User-Friendly Notifications, and Information Integration





Trial Results

A trial on 10 internal respondents from BAZNAS Banyumas Regency produced the following data.

Evaluation Aspects	Satisfaction Percentage
Ease of use	90%
Calculation speed	85%
Zakat education/understanding	80%

These results show that the application not only functions as a calculation tool, but also as a means of zakat education.

Conclusion

The Streamlit-based zakat calculator application has proven to be a practical and educational solution for the community in calculating their zakat obligations on income. With a simple and interactive design, this application can improve zakat literacy while supporting transparency in ZIS management at the Regency BAZNAS.Banyumas.

Acknowledgements

The author would like to thank BAZNAS RI and all regional BAZNAS for their full

support in this research, as well as the IT team, Public Relations team, and fellow researchers who contributed to data collection, system testing, and the preparation of the research report.

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