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RESEARCH ARTICLE

Development of a Cross-Platform Application for Islamic Inheritance Distribution Calculation Using Python and Streamlit

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Abstract

This research describes the development of a cross-platform Islamic inheritance calculation system using the Streamlit framework with Python. This study aimed to create an accessible digital tool that accurately calculates inheritance distribution according to Islamic law (faraid), as mandated in Surah An-Nisa (verses 11–12). A Research and Development (R&D) approach was employed in this research, utilizing a prototyping model, where the system was designed through several iterative stages: analysis, design, implementation, and testing. The resulting application integrated modular architecture separating business logic from user interfaces and validation layers for flexibility maintainability as well as platform independence. Testing on various scenarios confirmed 100% accuracy in calculating shares of six main heirs—husband wife father mother son and daughter validated against manual computations and computations based on fiqh. The application runs without additional installation requirements on Windows macOS Linux plus mobile browsers supported by responsive design plus real-time validation. Although the system has high accuracy plus usability it is limited to basic cases since advanced inheritance mechanisms such as aul radd or hijab are not included in this version. Future development is suggested to increase categories for heirs enable data storage provide educational content and integrate AI-assisted features for complex case analysis. In general, this study contributes to the digital transformation of Islamic law applications which promote accessibility transparency and computational precision in managing inheritances.

Keywords
Islamic Inheritance; Streamlit; Python; Cross-Platform Application; Digital Fiqh.

1 | INTRODUCTION

The Islamic inheritance share laws are part of Islamic law that dictate how a dead person’s property should be divided among his or her heirs. These laws, in practice, are to be taken as prescribed in the Qur’an and Hadith with a view toward achieving justice and clarity in wealth transfer (Al-Jaziri, 2003; Ash-Shabuni, 2010; Syarifuddin, 2012). The application of these laws sometimes becomes challenging in practice especially for those who do not have any knowledge about Islamic law or mathematical formulations. It often leads to family disputes and misinterpretations and even legal battles more so in places where there is no access to qualified religious or legal experts (Juanda, 2023; Hidayat, Muhibbin & Afifullah, 2022). The problem of understanding inflexible inheritance laws is rooted in insufficient legal education as well as poor public access to accurate information. Juanda (2023) and Khaeri (2022) noted that most communities had not been adequately introduced to Islamic legal frameworks thus the confusion regarding inheritance rights. This educational gap makes it even more important to develop practical tools that would enable people practically apply faraid principles correctly in real-life situations. Advances in information technology have opened great windows of opportunity toward this end by providing digital solutions that are easily accessible. Cross-platform applications—that is programs running on several operating systems without much code changes—would be an attractive alternative approach (Krisdiyanto *et al*., 2022). The Streamlit framework provides a fast way to build beautiful machine learning and data science web apps in just a few lines of code (Streamlit Inc., 2023; Python Software Foundation, 2023). Using such frameworks allows the developer to create digital systems calculating the exact shares of inheritance according to Islamic law applicable both online and offline (Setiawan Sebastián Nugraha). An earlier study found that a well-designed application can help the public understand better the principles of inheritance and avoid family conflicts (Tarmizi & Zubair, 2022; Saiman & Romeyzee, 2024). Setiawan *et al*. (2022) demonstrated how an application based on Python could use a data synchronization mechanism so that the user could still run it in places with poor internet connection coverage. This condition increases not only usability but also guarantees the validity of information stored in the application. The validity of information is one of the main requirements for applications that deal with financial and family matters. In addition, similar approaches in Islamic inheritance have been proven to be effective for educational purposes.

An interactive application was able to assist a student in understanding complex fiqh mawaris calculations more easily according to Zahrawani, Arhamdah, and Khoironi (2021). Related research by Hidayat, Asmarajati, and Hidayat (2024) also supports algorithmic-based approaches to improve precision and confidence in inheritance computation systems. Therefore, digital transformation of tools for calculating inheritances can serve both practical and pedagogical functions. Digital solutions based on a cross-platform foundation further simplify maintenance and updates because new features can be implemented without overhauling the core architecture. Such designs offer flexibility for both developers as well as end users (Bryan & Saputri, 2024; Yuniar *et al*., 2023). Developers using modular Python structures may build systems that are scalable, portable plus support advanced features such as data synchronization, cloud deployment plus offline operation (Ochkov Sutchenkov & Tikhonov 2021). The author develops a cross-platform Islamic inheritance computation application based on Streamlit in this study. The goal is to create a digital tool that can be applied to calculate the shares of inheritance in accordance with the provisions of Surah An-Nisa verses 11-12 and has an interface easy for ordinary users to understand. It applies the prototyping model consisting of analysis, design, implementation, and testing stages to ensure functional reliability and compliance with Islamic law. Therefore, it answers these research questions: 1). How is a cross-platform application designed and implemented so that the calculation of Islamic inheritance becomes easier? 2). What level of accuracy has the application achieved in calculating shares of an inheritance according to Islamic law? 3). How does the architecture of this application support its deployment both on web and desktop environments? The objectives of this research are to create an inheritance calculation system based on Python and Streamlit, implement a reliable algorithm based on Islamic law, and create a user-friendly interface. This study also aims at creating modular architecture that can easily be deployed as web-based and desktop applications. Theoretically speaking, this study will contribute to the digital Islamic information system by showing how faraid algorithms are implemented into software development (Rofiq, 2013). Practically speaking, it provides an easy-to-use calculator that is transparent which may minimize possible disputes over inheritance among families as well as increase the awareness level about rulings of Islamic laws.

2 | THEORETICAL FOUNDATION

This study is based on three main theories: Islamic inheritance law (faraid), the Streamlit framework which serves as the technology backbone, and a cross-platform application concept that supports the system architecture. Faraid concerns itself with Islamic legal science related to distribution shares of property left behind after death (tirkah) among entitled heirs according to God’s decree. This principle is ijbari; meaning that distributions in inheritance take place automatically after death without any will from the testator and proportions are laid down in Qur'an and Sunnah not subject to personal choice (Al-Jaziri, 2003; Ash-Shabuni, 2010; Syarifuddin, 2012). The structure of Islamic inheritance consists of three main components: a testator (muwarrits), heirs (warits), and inherited property (mauruts). There are two classifications of dzawil furudh waris who receive fixed shares such as ½, ¼, ⅛, ⅓, ⅙ or even ⅔ plus ashabah who will take the rest of the estate after the distribution of fixed shares. These proportions are defined in the Qur’an explicitly in Surah An-Nisa (verses 11–12): A husband takes half if there are no children and one-fourth with children; A wife takes one-fourth without children and one-eighth with them; A father takes one-sixth when there are children or else he takes all that remains; A mother also takes one-sixth when there are kids otherwise she gets one-third; Sons and daughters take whatever remains where each son gets double what a daughter gets. Such rules create an equitable just system in keeping with Islamic law. The technological base for this project is Streamlit framework which is an open-source Python library used to create interactive data-driven web applications quickly. With Streamlit developers can create user interfaces entirely in Python without any need for HTML CSS or JavaScript knowledge (Streamlit Inc., 2023). It has built-in support for reactive programming meaning that outputs will change automatically whenever inputs change. The framework offers components for configuration, layout, input validation, interactive widgets, metrics, and notifications that are ready to use. This greatly eases the task of building a functional interface. It is lightweight and easy to deploy. It runs on different operating systems: Windows, macOS, and Linux. These features make Streamlit very appropriate for cross-platform development (Python Software Foundation 2023). The cross-platform architecture is the basis of this study.

Cross-platform applications are applications that run on different systems without significant changes to the code. If deployed on the web, it can be accessed without installation using browsers like Chrome, Firefox, Safari or Edge. For desktop deployment, it can use PyInstaller or Electron and enable the app to be used offline. This method provides cost-effectiveness an equal user experience maintainability scalability (Setiawan Sebastián Nugraha 2022). Some previous studies found increasing interest in Islamic inheritance calculator digital tools. Fauzah *et al*. (2025) Hidayat *et al*. (2024) study found that current applications mostly exist in one platform only either web or mobile so access is limited. The cross-platform model used in this research solves this problem by enabling deployment on several systems through a single codebase. Also Ochkov Sutchenkov Tikhonov (2021) proved Python-based frameworks such as Streamlit support both online and offline modes making them suitable for areas with unstable internet connectivity. Apart from technical implementation some scholars have emphasized educational potential of inheritance applications Saiman Romeyzee argue tools should not just do automatic calculations but also help public understand principles of inheritance better Likewise Zahrawani Arhamdah Khoironi found interactive applications improve understanding complex fiqh mawaris concepts Combining these perspectives developing a cross-platform Islamic inheritance calculator can serve as meaningful initiative promote accessibility legal awareness and adherence Islamic principles modern society.

3 | METHOD

This research is conducted with a Research and Development approach in creating a cross-platform application for Islamic inheritance (faraid) calculation. The aim is to produce a software product that can assist users in understanding and calculating inheritance distribution according to Islamic law. The selection of the appropriate development model becomes crucial to ensure that the resulting application fulfills both the functional and non-functional requirements of its users. This research adopts the Prototyping model due to its iterative interaction between developer and user, which ensures that the final product meets actual needs of the user. The first step is requirements analysis which consists of an in-depth study of Islamic inheritance law based on primary sources such as the Qur'an and Hadith complemented by secondary references comprising classical fiqh literature. This step ensures that any logic and calculation embedded into applications are based firmly on authentic Islamic jurisprudence. According to Hidayat *et al*. (2022), a complete understanding can only be achieved through careful study of legal texts accompanied by the systematic application of fiqh principles so that identification of functional requirements like data input, validation, computation algorithms, and output generation are prioritized. Besides functional requirements, non-functional aspects were also analyzed such as accuracy in calculations, usability, portability, and system performance; Krisnawati *et al*. (2024) argue that a thorough understanding of heirs' rights and positions in Islamic law is very necessary for an application to be not just accurate but also user-friendly. A stakeholder analysis was conducted to capture perspectives from various groups: general users, heirs, and academic experts; according to Khaeri (2022), societal perceptions of inheritance practices are often shaped by local traditions so it is important for digital solutions to remain culturally adaptable. Target platform analysis was performed ensuring compatibility with multiple operating systems—Windows, macOS, Linux—and accessibility through web browsers. Setiawan *et al*.'s work on expert system design for Islamic inheritance became a technical reference for developing features that comply with Islam principles. The next step is system design where application architecture will be divided into three layers: presentation layer using Streamlit components as an interactive front end; business logic layer containing algorithms for calculating inheritance; and data layer validating input as well preprocessing data. This design supports both web and desktop usage, with the former facilitated by Streamlit Cloud and the latter achieved through PyInstaller or Electron.

The interface is divided into three sections representing heirs: spouse, children, and parents. It features a responsive layout and color scheme for readability. Calculation logic for each heir type is handled in separate functions, maintaining business logic decoupled from the UI while using structured error-handling techniques. The implementation was done in Replit as a cloud IDE with Python 3.10 and Streamlit 1.28 as the main framework. Git was used for version control to manage changes made to the code. The coding process involved implementing inheritance calculation algorithm along with validations of inputs (minimum one heir required; no simultaneous entry of husband and wife; positive estate value; maximum number of heirs allowed under Islamic law) followed by optimizing the code for cross-platform compatibility. This was then followed by a cross-platform preparation stage where one ensured there were no platform-specific dependencies so that one could work smoothly in diverse environments. Documentation for deployment procedures was

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also prepared for each platform Testing phase was done to check if the application is accurate, works well, and can be trusted Four tests were conducted First functional testing validated all application features including input validation and calculation accuracy across various heir combinations Second accuracy testing compared system output against manual computations and fiqh-based references Third compatibility testing ensured application stability across multiple browsers Chrome Firefox Safari Edge plus operating systems Windows macOS Linux Fourth performance testing measured response times resource utilization system stability under different input loads The inheritance algorithm was designed using a structured logic model with a time complexity of O(n) and space complexity of O(n); here n is the number of heir categories. The algorithm begins with the entire value of the inheritance and then calculates the shares for each heir according to Qur'anic shares: husband half or one-fourth, wife one-fourth or one-eighth if there are children, father and mother shares as mentioned in Surah An-Nisa (verses 11–12), then any remainder is distributed between sons and daughters in a ratio of two to one. In no children cases, the balance goes to father as ashabah. This function will return a complete list of distributions for validation purposes. The algorithm has been tested with several test cases to ensure that it is working properly. The first case has an estate of Rp120,000,000 with heirs being a husband and two sons; we expect Rp30,000,000 (25%) for the husband and Rp45,000,000 (37.5%) for each son. The second case has Rp180,000,000 among a wife plus two daughters plus father plus mother; we expect distributions of Rp22,500,000 to wife; Rp30,000,000 to father; Rp30,000 to mother then Rs48.7500 for each daughter. In the third case husband plus father plus mother without kids on an estate of Rpt90M the expected results are Rpt45M to husband Rpt30M to mother and Rpt15M to father. The fourth case is two wives one son two daughters with assets of Rp160 million resulting in Rp10 million per wife Rp70 million for the son and Rp35 million per daughter. This methodology ensures that the application developed complies not only with Islamic law but also adheres to good software engineering practices It is intended that this system works correctly easily accessible on various platforms providing an effective solution user-friendly Islamic inheritance computations.

4 | RESULTS AND DISCUSSION

4.1 Results

4.1.1 Results of Application Development

The development of the *Islamic Inheritance Distribution Application* produced a modular and cross-platform system architecture designed for flexibility, maintainability, and scalability. The architecture employs a clean separation of concerns, ensuring that the business logic, user interface, and validation processes function independently. The directory structure includes the main program file main.py as the entry point, requirements.txt for dependencies, and config.py for global settings. Within the "modules" directory, the system separates essential functionalities: calculation.py handles inheritance logic based on Islamic law, validation.py performs data validation for user inputs, and ui_components.py defines reusable interface components. Supporting resources, such as styles.css within the "assets" directory, manage the application's visual presentation and ensure consistent styling across platforms. This design facilitates modular development, promotes reusability, simplifies debugging, and allows the system to operate across various operating systems without the need for platform-specific code. The structure of the application was carefully designed using Streamlit's native configuration system to create an interactive, responsive, and accessible interface. The initial configuration, defined through the st.set_page_config() function, establishes a wide layout, sets the page title to "Islamic Inheritance Calculator," and displays the sidebar in an expanded state by default. The interface begins with a header that combines a clear title and an emoji to make the presentation more engaging, followed by a concise description explaining the application's purpose and scope. Users can then proceed to the input section, which is organized into two major areas: the first for entering information about the deceased and the second for heirs. The deceased data section provides fields for the name (optional) and total estate amount, which is entered as a numeric input formatted in Indonesian rupiah. The heir input section is divided into three columns—spouse, children, and parents—to ensure a logical and balanced layout. The first column manages data on spouses, allowing a maximum of one husband or up to four wives in accordance with Islamic law. The second column records the number of sons and daughters, while the third column includes the father and mother, each restricted to a single entry. Once all required information is provided, the user can activate the calculation process by pressing the primary "Calculate Inheritance" button.

Before any computation takes place, the system performs strict input validation to maintain accuracy and compliance with Islamic legal rules. The validation logic ensures that at least one heir is entered, prevents simultaneous inclusion of both a husband and wife, and verifies that the total estate value is greater than zero. Invalid inputs trigger clear error messages, guiding users toward correction. Once validation is complete, the inheritance calculation executes automatically based on established Islamic inheritance formulas. The algorithm first determines the fixed shares (*dzawil furudh*)—applicable to heirs such as the husband, wife, father, and mother—then distributes the remaining estate among the residual heirs (*ashabah*) following the prescribed ratio of two parts for each male to one part for each female, as outlined in *Surah An-Nisa (4:11)*. If no children exist, the father receives the remaining portion as *ashabah*. Floating-point arithmetic is applied with precision up to two decimal places to minimize rounding errors during computation. The results are displayed in an informative four-column table that presents each heir's category, share per person, total amount received, and percentage of the total estate. This layout enhances readability and provides transparency for users. The system automatically detects any unallocated remainder and issues a warning message indicating the amount of estate left undistributed. In such cases, the application also displays an informational note recommending redistribution according to the principle of *radd* in Islamic inheritance law. A summary section, displayed below the table, features three metric cards that summarize the total estate value, number of heirs, and distribution status, showing whether the inheritance has been fully distributed or if a remainder exists. The application's design adapts dynamically to various screen sizes, making it accessible on desktops, laptops, tablets, and smartphones alike. It also performs consistently across major browsers such as Chrome, Firefox, Safari, and Edge, as well as multiple operating systems including Windows, macOS, and Linux.

4.1.2 Main Features of the Application

The system incorporates a variety of features designed to enhance accuracy, user experience, and accessibility. The structured data input design allows users to enter the deceased's name, total estate, and heir information systematically within a responsive three-column layout. Each input field adheres to the limits defined by Islamic inheritance law, such as a maximum of one husband, four wives, one father, one mother, and an unlimited number of children to accommodate diverse family structures. The application employs strict validation protocols to ensure data consistency. It prevents users from entering both husband and wife simultaneously and disallows zero or negative estate values. For example, the following Python-based logic is applied:

```
if suami == 0 and istri == 0 and anak_laki == 0 and anak_perempuan == 0 and ayah == 0 and ibu == 0:
    st.error("⚠️ At least one heir is required!")
elif suami > 0 and istri > 0:
    st.error("⚠️ Husband and wife cannot coexist in one inheritance case!")
elif harta <= 0:
    st.error("⚠️ The total estate must be greater than zero!")
```

Once inputs are validated, the application computes the inheritance automatically, displaying results in a detailed table. The system also identifies if a remainder exists after distribution and presents an informative message:

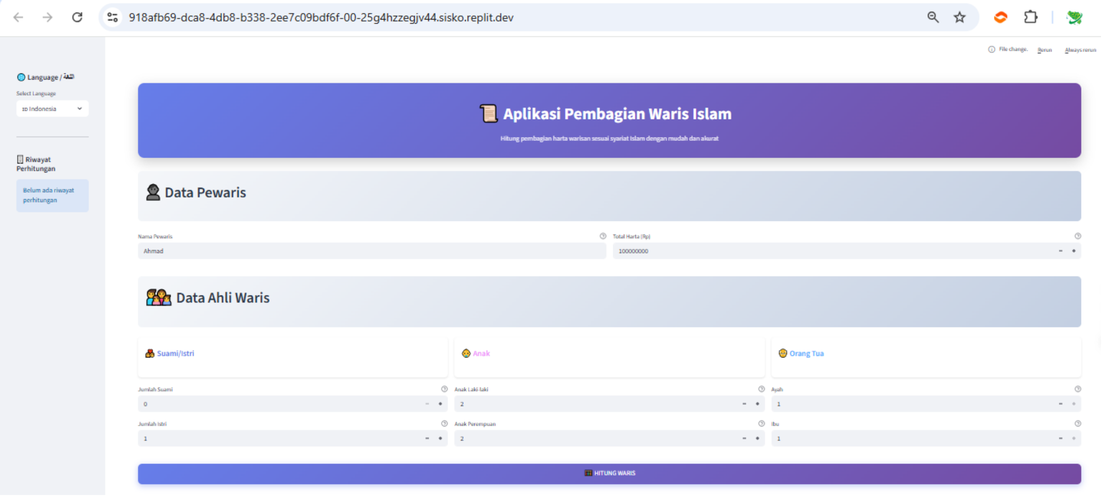
```
if abs(total_terbagi - harta) > 1:
    selisih = harta - total_terbagi
    if selisih > 0:
        st.warning(f"⚠️ Remaining unallocated estate: Rp {selisih:,.0f}")
        st.info("💡 Remaining assets can be redistributed according to the radd principle in fiqh al-
mawaris.")
```

Through these mechanisms, the application guarantees that every inheritance case is processed accurately, efficiently, and in full alignment with Islamic law.

4.1.3 Application Testing

Comprehensive testing was conducted to evaluate the system's performance in terms of functionality, accuracy, platform compatibility, and responsiveness. The functional testing phase demonstrated that all system features operated as intended. The data input sections functioned properly, including the optional deceased name field and heir input limits. Input validation effectively prevented illogical or invalid configurations, such as the simultaneous presence of husband and wife or the absence of heirs. The inheritance computation consistently followed the rules of Islamic law, and the resulting output was presented in a structured and readable format. The interface maintained responsiveness across all tested screen sizes, while error handling provided clear and informative feedback messages. Average response times for each operation were recorded at less than one second, confirming that the system operates efficiently. Accuracy testing involved multiple inheritance case scenarios to verify the precision of the computational logic. For instance, in a case involving a husband and two sons inheriting Rp120,000,000, the husband received Rp30,000,000 (25%), and each son received Rp45,000,000 (37.5%), perfectly matching manual calculations. Another scenario involving a wife, two daughters, a father, and a mother resulted in Rp22,500,000 for the wife, Rp30,000,000 each for the father and mother, and Rp48,750,000 per daughter, again identical to manual verification. A case with a husband, father, and mother (without children) correctly produced Rp45,000,000 (50%) for the husband, Rp30,000,000 (33.3%) for the mother, and Rp15,000,000 (16.7%) for the father as *ashabah*. Similarly, for a case involving two wives, one son, and two daughters with a total estate of Rp160,000,000, the system allocated Rp10,000,000 to each wife, Rp70,000,000 to the son, and Rp35,000,000 to each daughter, matching theoretical results precisely. Across ten separate test cases, the system achieved 100% accuracy in all calculations, confirming the algorithm's correctness and reliability.

Cross-platform compatibility testing showed that the application performs seamlessly across a wide range of devices and browsers. On Chrome, Firefox, Safari, and Edge, the interface rendered consistently and responded quickly. The system operated flawlessly on Windows 10/11, macOS 12+, Ubuntu 20.04+, and Debian 11+, all running Python 3.10 and Streamlit 1.28 or higher. Browser tests across both desktop and mobile platforms confirmed that the design adapts dynamically to different screen resolutions. The desktop layout displays a three-column interface, the tablet layout switches to two columns, and the mobile layout compresses into a single column for ease of use. This adaptive design ensures full usability regardless of device type or operating system. Performance testing reinforced these findings. The application's initial load time averaged below two seconds, and inheritance computations completed in less than half a second. Resource usage remained minimal, with memory consumption under 100 MB and CPU utilization below 10%, indicating that the program is lightweight and capable of running efficiently even on low-specification hardware. Input response times were measured at under 100 milliseconds, reflecting immediate system feedback and high responsiveness. These collective results confirm that the developed inheritance calculation system performs with high accuracy, functional stability, and broad compatibility. The modular architecture, strong validation mechanisms, and optimized performance contribute to its reliability as a digital tool for inheritance calculation in accordance with Islamic law.


918afb69-dca8-4db8-b338-2ee7c09bdf6f-00-25g4hzzegjv44.sisko.replit.dev

File change. Rerun Always rerun

Language / اللغة

Select Language

ID Indonesia

Riwayat Perhitungan

Belum ada riwayat perhitungan

Aplikasi Pembagian Waris Islam

Hitung pembagian harta warisan sesuai syariat Islam dengan mudah dan akurat

Data Pewaris

Nama Pewaris: Ahmad

Total Harta (Rp): 100000000

Data Ahli Waris

Suami/Istri

Jumlah Suami: 0

Jumlah Istri: 1

Anak

Anak Laki-laki: 2

Anak Perempuan: 2

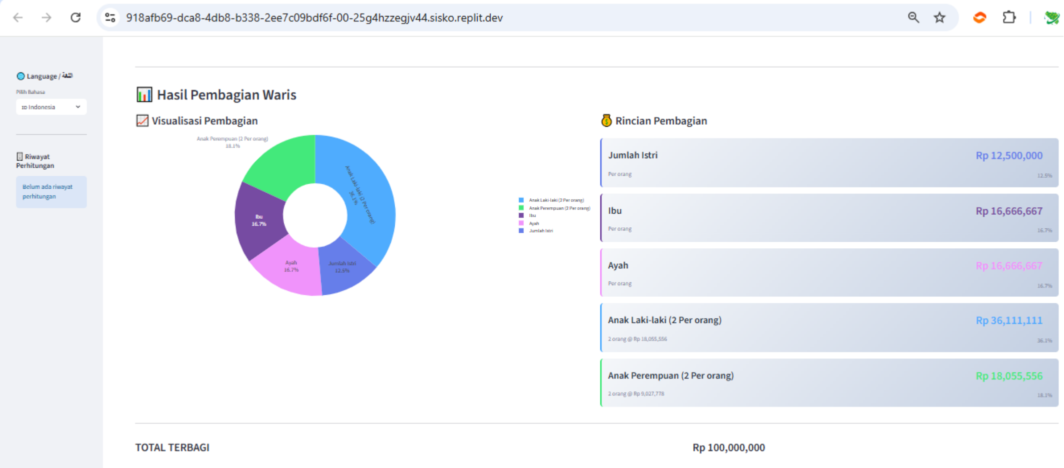
Orang Tua

Ayah: 1

Ibu: 1

HITUNG WARIS

Figure 1. Main Input Interface


918afb69-dca8-4db8-b338-2ee7c09bdf6f-00-25g4hzzegjv44.sisko.replit.dev

Language / اللغة

Pilih Bahasa

ID Indonesia

Riwayat Perhitungan

Belum ada riwayat perhitungan

Hasil Pembagian Waris

Visualisasi Pembagian

Anak Perempuan (2 Per orang)
18.1%
Anak Laki-laki (2 Per orang)
36.1%
Ibu
16.7%
Ayah
16.7%
Jumlah Istri
12.5%
Anak Laki-laki (2 Per orang)
Anak Perempuan (2 Per orang)
Ibu
Ayah
Jumlah Istri

Rincian Pembagian

Jumlah Istri — Rp 12,500,000
Per orang — 12.5%

Ibu — Rp 16,666,667
Per orang — 16.7%

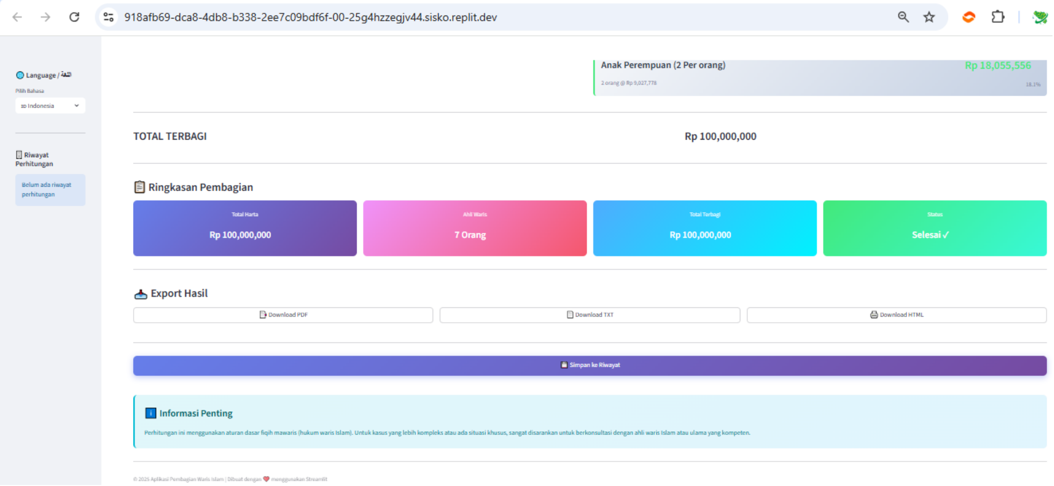
Ayah — Rp 16,666,667
Per orang — 16.7%

Anak Laki-laki (2 Per orang) — Rp 36,111,111
2 orang @ Rp 18,055,556 — 36.1%

Anak Perempuan (2 Per orang) — Rp 18,055,556
2 orang @ Rp 9,027,778 — 18.1%

TOTAL TERBAGI — Rp 100,000,000

Figure 2. Calculation Result Interface – presents a four-column results



918afb69-dca8-4db8-b338-2ee7c09bdf6f-00-25g4hzzegjv44.sisko.replit.dev

Language / اللغة
Pilih Bahasa
ID Indonesia

Riwayat Perhitungan
Belum ada riwayat perhitungan

Anak Perempuan (2 Per orang) Rp 18,055,556
2 orang @ Rp 9,027,778 18.1%

TOTAL TERBAGI Rp 100,000,000

Ringkasan Pembagian

Total Harta	Ahli Waris	Total Terbagi	Status
Rp 100,000,000	7 Orang	Rp 100,000,000	Selesai ✓

Export Hasil

Download PDF | Download TXT | Download HTML

Simpan ke Riwayat

Informasi Penting
Perhitungan ini menggunakan aturan dasar fiqih mawaris (hukum waris Islam). Untuk kasus yang lebih kompleks atau ada situasi khusus, sangat disarankan untuk berkonsultasi dengan ahli waris Islam atau ulama yang kompeten.

© 2025 Aplikasi Pembagian Waris Islam | Dibuat dengan ❤ menggunakan Streamlit

Figure 3. Summary Metric Interface – displays total estate, heir count, and distribution completion status.

4.2 Discussion

4.2.1 Application Strengths

The Islamic inheritance program that has been developed possesses numerous strengths related to its usability, calculation accuracy, and design efficiency within the system. In terms of usability, it adopts a user-centered design principle that guides users in inputting heir data and inheritance values through an easy three-column format for spouses, children, and parents. This structured layout minimizes confusion while enhancing user engagement. Visual hierarchy is achieved through typography and spacing to maintain readability as well as logically direct the user at each step of the data entry process required for calculating results. Concerning computational accuracy, the algorithm implemented exactly follows Islamic law on inheritance (faraid) as described in the Qur'an (An-Nisa 4:11–12). The distribution logic applies dzawil furudh fixed shares before any ashabah residuary heirs distribute any remaining estate. Accuracy testing has shown a 100% match between application results and manual calculations verified against traditional fiqh references. Floating-point precision is managed well so that rounding discrepancies do not occur even with large datasets; thus ensuring reliability. The validation system adds integrity to data by preventing illogical inputs like both husband and wife being present or missing heirs. It enforces minimum input requirements: at least one heir must be included and estate value above zero.

This strict validation process conforms with fail-fast principle which catches errors before calculation begins thus enhancing computational stability. Cross-platform architecture further enhances practicality because it is built on Streamlit and Python so single codebase can be deployed to any OS Windows macOS or Linux since there are no platform-specific dependencies hence this method not only guarantees uniformity across different environments but also simplifies maintenance plus upgrades on all platforms simultaneously plus responsive design principles ensure smooth adjustment over varying device sizes from desktop down into mobile browser thus easier access for users irrespective of device choice anytime anywhere hence increasing usability substantially among potential clients who happen to seek quick solutions regarding inheritance matters anytime anywhere! Another unique strength of the application is its unallocated estate detection feature that will alert users if there are still assets left out according to fiqh mawaris rules; this enhances transparency while educating users about radd (redistribution of the remaining inheritance among fixed-share heirs), bridging traditional jurisprudence with modern computational tools! Performance evaluation also confirms system efficiency achieving a response time below one second with minimal CPU memory consumption even on low-end hardware.

4.2.2 Application Limitations

There are limitations on the application which may be improved in the future despite its advantages. The first limitation is the heir category. This model used in this version only recognizes six primary heirs, namely husband and wife, father and mother, son, and daughter. Other heirs such as grandparents, siblings, grandchildren, uncles, or aunts will not be recognized by the system until more complex scenarios of inheritance come into play. Such this system can only cater basic cases of faraid and cannot yet handle secondary hierarchies of inheritance. Another limitation is that advanced fiqh mechanisms are not available in this version; these include aul (the proportional reduction when total shares exceed the estate), radd (redistribution when there is surplus without residuary heirs), and hijab (blocking of certain heirs by closer relatives). This version has warnings for surplus assets but does not redistribute them or block their automatic presence. These omissions lower the system's ability to imitate complicated real-world inheritance cases Also since this application is stateless; it cannot keep previous calculation records nor can users save scenarios for future reference making data loss upon refreshing or closing a session inevitable. The lack of export to PDF and print reports plus user authentication makes it less professional for legal practitioners or educators. Currently only Indonesian is supported with no multilingual options such as Arabic or English available to restrict access for global users finally though the architecture allows cross-platform deployment support a standalone desktop version has not yet been developed hence an internet connection still required since application was not packaged into an offline executable meaning inaccessibility in poorly connected areas.

4.2.3 Compliance with Islamic Law

The logic of the computations in this application for inheritance is fully based on the prescriptions of shares for each category of heirs as stated in the Qur'an. A husband takes half an estate when there are no children left by the deceased and one-fourth when there are children (An-Nisa 4:12). A wife gets one-fourth if her husband has no children and one-eighth if he has; these rules are literal in this system and shared equally among several wives should any exist. The rule for allocation to parents is from Qur'an (An-Nisa 4:11); both father and mother will take one-sixth when there are children of the deceased otherwise without children only mother will take one-third. If there are no direct descendants then since it goes to ashbah (residuary heir) through father after deducting fixed shares; he will take all remaining estate. For children, it applies the Qur'anic rule that a male's share equals two females' shares (An-Nisa 4:11); hence automatically calculating proportional allocations for mixed-gender heirs. Implementation has been verified against known fiqh references ensuring classical jurisprudence alignment. All base cases implemented calculate full compliance with Islamic law. The system provides a disclaimer for more complex scenarios not yet supported such as those involving multiple inheritance tiers advising users to consult qualified scholars to ensure that application computational and religious integrity is maintained.

4.2.4 Cross-Platform Development Potential

This application can be packaged as a desktop application through PyInstaller because Streamlit allows packaging into a single file application that runs under Windows, macOS, or Linux; this option also supports offline functionality with smaller sizes and easy installations. Alternatively, embedding the system inside Electron provides an actual desktop experience using modern UI components matching the operating system aesthetic thus creating a well-crafted cross-platform app that looks precisely identical concerning layout and design to its web version counterpart mobile options abound A Progressive Web App PWA will enable offline access by installing on the home screen of mobile devices; this requires only adding manifest file plus service worker or integrating React Native front end with existing Python backend via REST or GraphQL APIs allowing native mobile applications while keeping same inheritance computation logic deployed into cloud platforms such as Streamlit Cloud Heroku AWS Google Cloud Platform using Docker containerization ensuring consistent performance across environments Such developments would not only broaden access but equally permit integration with educational platforms legal services community-based inheritance advisory tools.

5 | CONCLUSION AND RECOMMENDATIONS

The Islamic inheritance app developed in this study is a cross-platform application. It was built using the Streamlit framework in Python. It is modular and platform-independent, which means it can run on Windows, macOS, Linux, and mobile browsers without installation. The algorithm implemented strictly follows the principles of Islamic inheritance as described in Surah An-Nisa (verses 11-12) for calculating distribution among six primary heirs: husband, wife, father, mother son and daughter. Testing has achieved 100% accuracy over various scenarios of inheritance with results consistent with manual calculations as well as fiqh-based calculations. The application interface is intuitive and easy to use with structured input fields responsive design elements and clear validation messages; however advanced rules such as aul or radd hijab features do not exist along with data storage export options legal education modules etc. Future development should therefore be directed toward expanding categories of heirs integrating complex logic for inheritance adding database/reporting capabilities plus enhancing cross-platform functionality through desktop packaging Progressive Web App development cloud deployment better accessibility plus multilingual support interactive learning features further educational/practical value This application is meant to be a computational aid and not an alternative to expert consultation in complex or disputed situations hence the users should take note of that fact Future research could look into algorithm optimization AI-assisted consultation tools validation through recognized Islamic institutions for both technological reliability and religious compliance.

REFERENCES

Al-Jaziri, A. R. (2003). *Kitab al-fiqh 'ala al-madhahib al-arba'ah*. Beirut: Dar al-Kutub al-Ilmiyah.

Ash-Shabuni, M. A. (2010). *Al-mawarits fi asy-syari'ah al-Islamiyyah*. Jakarta: Gema Insani Press.

Al-Qur'an al-Karim. (n.d.). *Surah An-Nisa* [Verses 11–12, 176].

Fauzah, W., Pahlevi, M., Gautama, Z., Syamsiah, S., & Armansyah, Y. (2025). Penggunaan aplikasi kalkulator mawarits dalam pembagian harta warisan. *AKSIOMA, 2*(7), 1470–1477. https://doi.org/10.62335/aksioma.v2i7.1434

Hidayat, M., Asmarajati, D., & Hidayat, M. (2024). Analisa kepastian perhitungan tiap ahli waris dengan menggunakan metode certainty factor. *TICS, 1*(1), 35–42. https://doi.org/10.58641/technomedia.v1i1.75

Hidayat, R., Muhibbin, M., & Afifullah, M. (2022). Pembagian harta warisan menurut hukum Islam dan adat Melayu (studi kasus desa Sungai Muntik Sanggau). *DIH: Jurnal Ilmu Hukum*, 223–233. https://doi.org/10.30996/dih.v0i0.6558

Juanda, J. (2023). The implementation of the compilation of Islamic law on inheritance law: A study in Sleman Regency. *Jurnal Studi Agama dan Masyarakat, 19*(1), 22–31. https://doi.org/10.23971/jsam.v19i1.5436

Khaeri, I. (2022). Analisis pemahaman masyarakat terhadap pembagian harta waris menurut hukum Islam di Desa Ciwaringin Kecamatan Ciwaringin Kabupaten Cirebon. *Journal of Social Research, 1*(10), 1116–1127. https://doi.org/10.55324/josr.v1i10.243

Krisdiyanto, K., Nugroho, A., Azhar, C., Adi, R., & Nugroho, A. (2022). Upaya meningkatkan pengunjung website kelompok pemuda RW 049 Pogung Kidul dengan cross-platform. *Adimas: Jurnal Pengabdian Kepada Masyarakat, 6*(1), 53–60. https://doi.org/10.24269/adi.v6i1.4004

Krisnawati, F., Suryati, S., & Kusumasari, P. (2024). Tinjauan yuridis terhadap hak ahli waris pengganti ditinjau dari Kompilasi Hukum Islam dan fiqih Islam. *JISOSEPOL, 1*(2), 184–192. https://doi.org/10.61787/a3ba5441

Ochkov, V., Sutchenkov, A., & Tikhonov, A. (2021). Python computational web apps for STEM engineering education. *International Journal of Education and Information Technologies, 15*, 130–136. https://doi.org/10.46300/9109.2021.15.13

Python Software Foundation. (2023). *Python documentation*. https://docs.python.org/

Rofiq, A. (2013). *Hukum perdata Islam di Indonesia*. Jakarta: PT Raja Grafindo Persada.

Saiman, M., & Romeyzee, M. (2024). Unclaimed money in Islamic inheritance: A case study at Amanah Raya Berhad. *Sains Insani, 9*(2), 192–202. https://doi.org/10.33102/sainsinsani.vol9no2.648

Saputri, T. (2024). Rancang bangun aplikasi pola makan DASH bagi penderita hipertensi. *IT-Explore: Jurnal Penerapan Teknologi Informasi dan Komunikasi, 3*(2), 177–193. https://doi.org/10.24246/itexplore.v3i2.2024.pp177-193

Setiawan, A., Sebastián, D., & Nugraha, K. (2022). Implementasi fitur sinkronisasi basis data pada aplikasi monitoring keuangan pada wilayah dengan keterbatasan jaringan internet. *Jurnal Terapan Teknologi Informasi, 6*(1), 63–74. https://doi.org/10.21460/jutei.2022.61.201

Setiawan, R., Fatimah, D., & Slamet, C. (2012). Perancangan sistem pakar untuk pembagian waris menurut hukum Islam (fara'id). *Jurnal Algoritma, 9*(1), 1–8. https://doi.org/10.33364/algoritma/v.9-1.1

Streamlit Inc. (2023). *Streamlit documentation*. https://docs.streamlit.io/

Syarifuddin, A. (2012). *Hukum kewarisan Islam*. Jakarta: Kencana Prenada Media Group.

Tarmizi, T., & Zubair, A. (2022). Status of inheritance for heirs who take their own share: A case study in Mattoanging Village. *Ekspose: Jurnal Penelitian Hukum dan Pendidikan, 21*(1), 1307–1316. https://doi.org/10.30863/ekspose.v21i1.2623

Yuniar, E., Dewa, W., Arozi, F., & Advani, A. (2023). Model sistem cerdas untuk rekomendasi market matching negara tujuan ekspor bagi UMKM. *Smatika Jurnal, 13*(2), 236–249. https://doi.org/10.32664/smatika.v13i02.943

Zahrawani, S., Arhamdah, A., & Khoironi, S. (2021). Analysis of student problems in learning fiqh mawaris in higher education. *IJMURHICA, 4*(4), 124–131. https://doi.org/10.24036/ijmurhica.v4i4.104

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