International Journal of Synergy in Engineering and Technology
IJSET

An Innovative Zakat Calculation System for Gold

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KEYWORDS

Zakat
Malaysia
Gold
App Development

ABSTRACT

Zakat is one of the pillars of Islam and refers to the obligation of Muslims to donate a portion of their wealth to help other Muslims. Zakat contributions are voluntary in a majority of Muslim countries, however, in some countries including Malaysia, zakat is mandatory and under the purview of the State. Assets that are commonly subject to zakat include cash, agricultural products, minerals, and livestock. Gold falls under the minerals category and if the amount of gold owned exceeds the nisab rate, it is subject to zakat contribution. Zakat contribution is compulsory for gold in any form, whether worn, kept or invested. The nisab rate is dependent on the current market price of gold. There are currently two approaches for self-calculation of zakat in Malaysia for gold either using Apps downloaded and installed; or by accessing the Islamic Religious Council's website. Although most Apps and websites offer the service of zakat calculation, two shortcomings noted are the determination of nisab rate and the weighing of gold, which could lead to inaccurate zakat calculation results. As such, Gold-Z, an innovative zakat calculation system for gold is developed to address these issues. Not only Gold-Z provides zakat calculation services in Malaysian context, but also a weighing mechanism to determine the weight of gold held. This provides a more accurate reading (of the value of gold), and a more accurate zakat calculation. Initial test results indicate that the system is working as expected producing the correct zakat total for gold held.

1.0 Introduction

Zakat is one of the pillars of Islam and ranked second after prayer [1]. It refers to the obligation of Muslims to donate a portion of their wealth to help other Muslims (*asnaf*). It is seen as a way to purify yearly earnings that are over a pre-determined threshold (*nisab*) [2]. Zakat is based on the value of wealth [3], which includes income, savings and other assets. If wealth is below the *nisab*

Received 27 Jan 2023; received in revised form 24 March 2023; accepted 31 March 2023.

rate, no zakat is owed for that year. In a majority of Muslim countries, zakat contributions are voluntary, however, in some countries, such as Malaysia, zakat is mandatory and under the purview of the State [4].

The obligation for zakat contributions can be found in the Quran (at-Taubah:60; al-Anbiyaa':73; al-Mukminun:4) and Hadiths (Sahih Bukhari 24:486, 24:493; Sahih Muslim 4:1925). The amount of zakat is dependent on the type of assets. Although the Quran does not specifically dictate the type of assets for zakat, Muslim countries generally observe a 2.5% zakat contribution for liquid assets including cash. Other assets that are commonly subject to zakat contribution include agricultural goods and products, minerals (gold, silver, etc.), and livestock. The zakat for this category varies between 2.5% and 20% [5].

Gold falls under the minerals category and if the amount of gold owned exceeds the *nisab* rate, it is subject to zakat contribution in Malaysia [6]. Zakat contribution for gold has been set forth by the Fatwa Council of the respective states in Malaysia where the *nisab* rates vary between states [7]. The determination of *nisab* rate is made after careful study and deliberations by the Fatwa Council of respective states [8].

Zakat for gold is compulsory for gold in any form, whether it is worn (jewellery), kept or invested (coin, bar, bullion, etc). The current *nisab* rate for gold (kept) is 85 grams [9] whilst the *nisab* rate for gold (worn) varies as the calculation involves the current market price of gold. As the price of gold fluctuates, so does the zakat contribution.

Although most Apps and websites offer the service of zakat calculation, two shortcomings noted are the determination of *nisab* rate and the weighing of gold, which could lead to inaccurate zakat calculation results. Among the problems are the difficulty to accurately calculate the weight of gold and time for browsing numerous websites for nisab rate. As such, there is a need for a mechanism to address these issues for accurate zakat calculation.

This paper reports the design and development of an innovative *Zakat Calculation System for Gold* (Gold-Z) at University College TATI by the Software Engineering Research Group. The group is actively involved in the development of computer solutions to address current industrial problems. Past projects include a search portal for Private Higher Education Institutions in Malaysia [10], an online community security system [11], an App for the tourism industry in Terengganu [12], an App to check the status of Islamic preachers in Malaysia [13], and a system to evaluate the quality of e-Book [14].

2.0 Current Approach for Zakat Calculation

There are currently two approaches for self-calculation of zakat in Malaysia, using android App downloaded and installed from *Google Play Store*, or through the respective state Islamic Religious Council's website (*Majlis Agama Islam Negeri*). The widespread use of electronic gadgets including smartphones and tablets has seen tremendous development of Android applications (Apps) from individuals and companies alike. Due to its portability and accessibility, the list of Apps has increased dramatically. As of June 2021, Android held a share of 74.99% of the mobile operating system market in Malaysia. Examples of existing Apps for zakat calculation are illustrated in Figures 1(a) to 1(d).

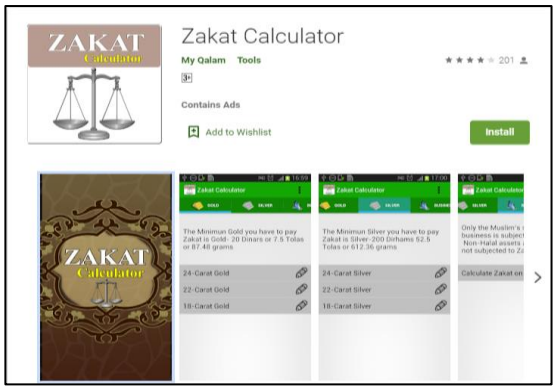

Figure 1(a): Zakat Calculator [15]

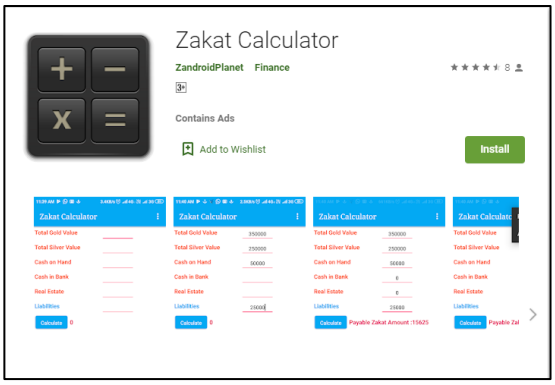

Figure 1(b): Zakat Calculator [16]

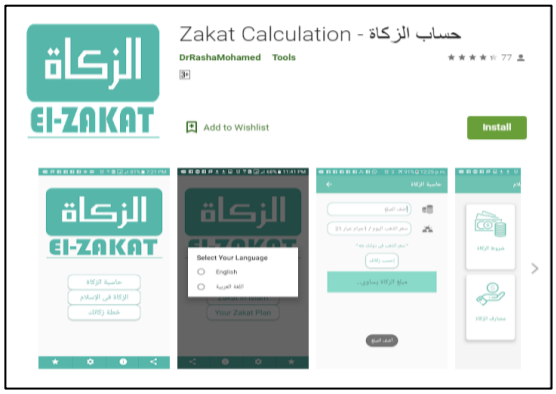

Figure 1(c): Zakat Calculation [17]

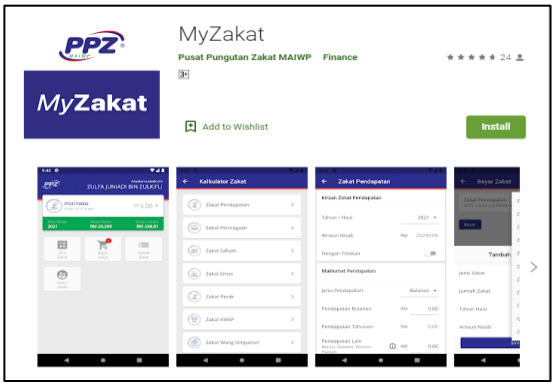

Figure 1(d): MyZakat [18]

Examples of zakat calculation websites are illustrated in Figures 2(a) to (c). The calculators are provided by *Majlis Agama Islam dan Adat Melayu Terengganu*, *Majlis Agama Islam dan Adat Melayu Pahang*, and *Majlis Agama Islam Selangor*, the respective Islamic Religious Council's website for the state of Terengganu, Pahang and Selangor.

Figure 2(a): Zakat Calculator Website for the state of Terengganu [19]

Figure 2(b): Zakat Calculator Website for the state of Pahang [20]

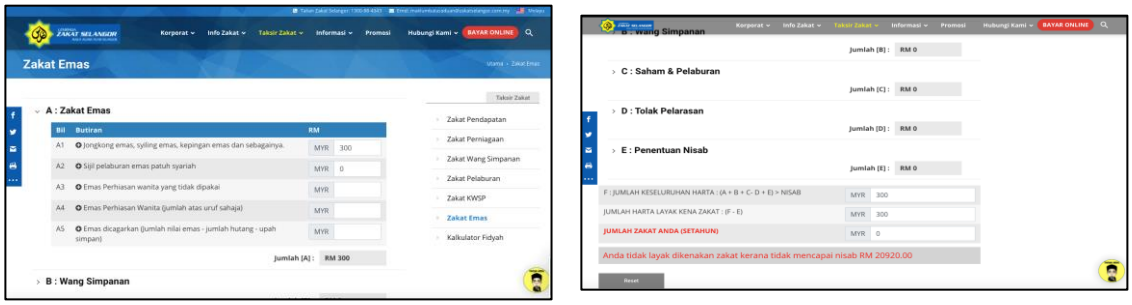

Figure 2(c): Zakat Calculator Website for the state of Selangor [21]

Although most Apps and websites visited offer the service of zakat calculation to the users, there are two notably shortcomings namely the determination of *nisab* rate and the weighing of gold. The *nisab* rate varies from state to state and from country to country. As such, by using a general App from other countries (Figures 1(a) to (c)), users must have prior information of the local *nisab* rate and input it into the App. If not, the calculation of zakat would be misleading. Secondly, although there are local websites that can cater this problem, such as highlighted in Figure 1(d) and Figures 2(a) to (c), the weight of gold is entered manually by the user. This opens the possibility of weighing error and thus, inaccurate zakat calculation results. There is yet a solution to this problem – the automatic weighing of gold for zakat calculation.

3.0 Methodology

Agile methodology been used in this project. It is quite popular in software development due to its effectiveness and result-oriented approach. Agile is considered to bring in incremental changes, allowing software development projects to become more flexible in responding to changing requirements and increasing acceptance rate [22].

3.1 Proposed Solution

An integrated system is proposed to address the issues highlighted in the previous section. The system will not only provide zakat calculation services, but also a mechanism to determine the weight of gold held. This would provide a more accurate reading (of the value of gold), and thus a more accurate zakat calculation. The *nisab* rate for all states in Malaysia would be loaded into the system for zakat contribution calculation based on the locality of the user. The overall idea of the system is illustrated in Figure 3.

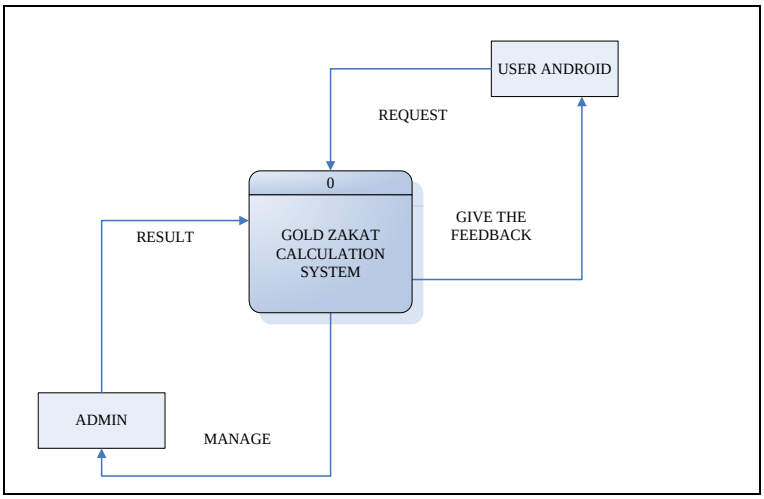

Figure 3: System Context Diagram

The admin input *nisab* rates for all states in Malaysia into the system. The user utilizes the system for zakat calculation. Any issues or comments can be relayed back into the system where the admin will can carry out necessary modifications to the system (if necessary).

3.2 System Design

The overall flow of the system is illustrated in Figure 4.

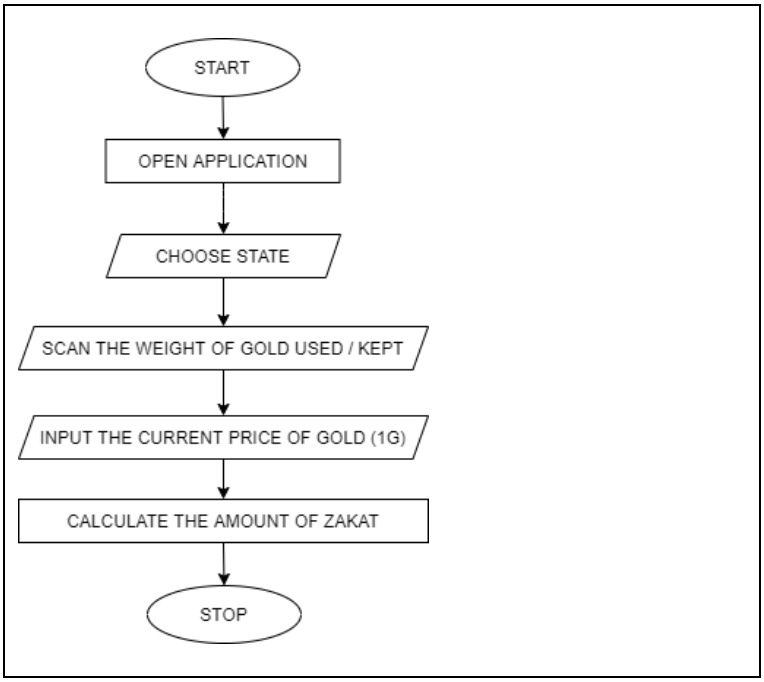

Figure 4 : System Flowchart

4.0 Implementation

Gold-Z was developed using *Android Studio standard package Eclipse IDE for Java Developers*. The weight of gold can be measured on a digital scale, which is commercially available in the

market. In this study, a digital gram scale that measures up to 1kg is used. The scale measures the weight of the gold and transmits the data to the system via Bluetooth (Figure 5).

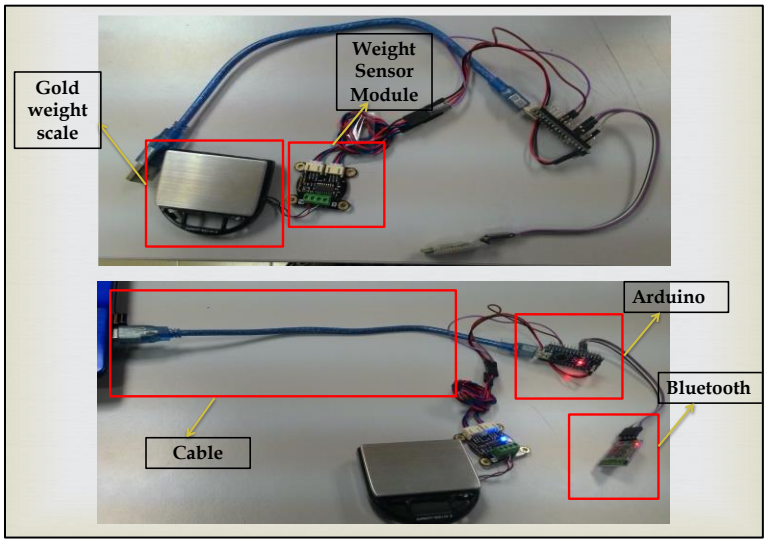

Figure 5: Digital Scale for Weighing Gold

Gold-Z enables user to calculate zakat for gold based on its usage (worn or kept). User first selects the respective states in order for the system to determine the correct *nisab* rate. Figures 6(a) to 6(f) illustrate the whole process of zakat calculation using the system.

Figure 6(a): Main Screen

Figure 6(b): State Selection

Figure 6(c): Gold Category

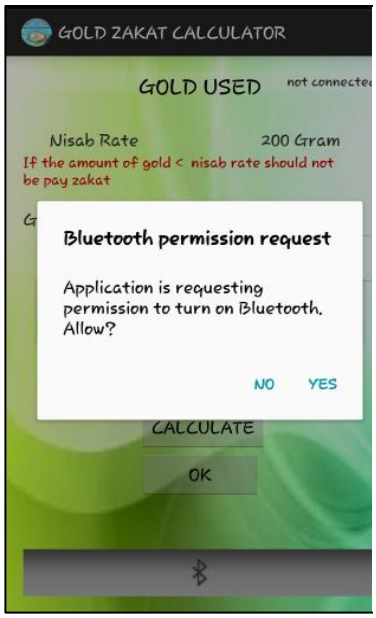

Figure 6(d): Bluetooth Connection

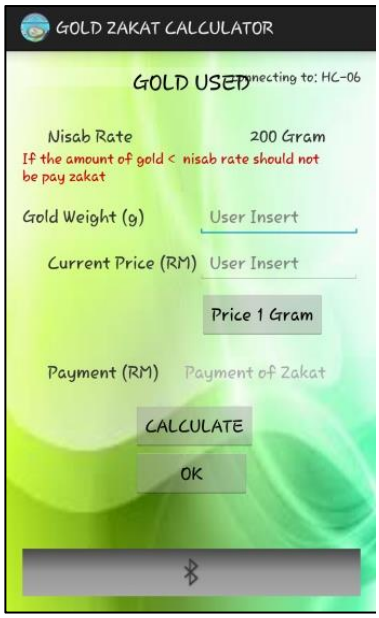

Figure 6(e): Nisab Rate

Figure 6(f): Calculation Screen

In the above example, the user starts at the main screen (Figure 6(a)) and then proceeds to the selection of state (Figure 6(b)) to determine the respective *nisab* rate. Next, the user selects the category of the gold held, either worn or kept (Figure 6(c)). In this example, the *nisab* rate for the state of Pahang is used. Figure 6(d) illustrates the connection to digital scale through Bluetooth screen.

The user is presented with the current *nisab* rate (200gms for the state of Pahang, Figure 6(e)). Should the weight of gold held is below than this threshold, then no zakat is payable. The user will then insert the current price for gold (MYR/gm) and the zakat contribution will be automatically calculated (Figure 6(f)). Link to the official zakat collection centre (the state of Pahang) will be displayed to the user for payment purposes.

The functionality and operationality of the system was tested by a group of 20 users comprising of students and staffs at University College TATI. Initial results indicate that the system is working as expected producing the correct zakat total for gold held. A more rigorous testing was not carried out due to time constraints and will be administered in the future.

5.0 Conclusion

This paper has presented Gold-Z, an innovative zakat calculation system for gold, addressing the problems of varying *nisab* rates among states and the weighing of gold held in Malaysia. The system promotes a more accurate calculation of zakat using a digital scale and individual state's *nisab* rates. The underlying technology can be adapted to other zakat categories and in other states, with minor modifications. It is hoped that this small contribution would facilitate zakat self-calculation among Muslims. Direction for future works include real-time gold price from official sources.

Acknowledgments

This research is supported by UC TATI Short-Term Grant (STG) GPJP 1/2021 9001-2109. The authors fully acknowledged University College TATI (UC TATI) for the approved fund, which makes this important research viable and effective.

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