

# Information Systems Applications in the Reporting and Accountability of BMT ZIS Funds in Jakarta

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**Abstract**--This research is aimed to assess an information system application in the zakah fund accountability and the report in *Baitul Maal Wat Tamwil* (BMT) institution. When we observed the zakah fund from the *Baand Amal, Zakat, Infaq and Shadaqah* (BAZIS) institution we find that this fund called Zakat, Infaq and Shadaqah (ZIS) is potentially benefit to sharia institutions in term of developing their capability to expand their businesses and to strengthen their capital to be able to compete with any other micro finance institutions. Thus, the demand from the society about the transparency of zakah fund management from BAZIS to BMT have resulted in the use of information system application in the report and accountability process. Furthermore, the use of information system application have engaged the BMT institutions to mutually level their position in the competition with another micro finance institutions.

**Keywords**--Zakah, Micro Finance Institution, Report, Accountability

## I.INTRODUCTION

The development of the *BaitulMaalWatTamwil* (BMT) or other micro Islamic institutions in Indonesia shows how encouraging progress was marked by the increasing amount of assets managed by these institutions every year. Islamic micro finance institutions had experienced a booming or a significant growth spurt in 1996 until the year 1998 since the establishment of first Islamic co-operative institution in 1990 and the establishment of Islamic banks of Muamalat in 1991. In 2005, the assets that managed by BMT of which were members of Small Business Incubation Center (PINBUK) was not less than IDR 1 trillion, with the membership of more than 3000 BMTs. But then the growth has been slowing due to BMT-induced financial crisis in 1998 where many BMT were not strong enough in capital and non-professionalism in the management had led to collapses or bankruptcies.

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The situation then became increasingly difficult for BMT because after the financial crisis, some conventional banks or non - Islamic capital market will begin to look in to BMT for the small traders in the market that have loan's ceiling of less than IDR 5 million but rarely would lead to bad credit. The banks which have massive capitals began to open up micro-credit services also, both in conventional and Sharia-compliant in the traditional markets of which are the main area of BMT customers thus have been providing hard competition for the BMT. According to M.Soekarni, et al, [7], The Government through the Agency of *Amil Zakat Infaq and Shadaqah* (BAZIS) institute starting in 1999 has provided funding assistance from infaq and shadaqah to 14 BMT Mudharabah financing method of which was the method of financing to small traders in the traditional markets while financing methods of *qardhul hasan* of which is interest-free assistance was provided to small traders. The program according to M.Soekarni, et al, [7], could not accomplished well because of the 14 BMT unless BMT Al Kareem, have been showing bad performances. In realizing that only this BMT that have shown good performances, BAZIS zakat funds then established cooperation with BMT Al Kareem in 2005 so it had changed the name of BMT Al Kareem into BMT Al Kareem Bazis. BAZIS grants to BMT have been made possible by the Act 21 of 2008 concerning on *Shariah Banking and Shariah Unit Entities*. According to this law Baitul Maal BAZIS as an institution could run a social function of which was receiving funds from zakat, infaq, Shadaqah and grants from the community to be distributed to the parties entitled to receive it (*mustahiq*). BMT have also managed to be the source of loanable funds to micro and small entities as addition to their capitals. Meanwhile, according to Sri Imaniyati Neni, [6], the functions as an institution of BMT Islamic micro entities that managed the charities was set out in the Act No.38 of 1999 [10]. The community as interested parties to BAZIS as been stated in Pelita electronic newspaper articles, have been asked for transparency and accountability as mentioned about the management of zakat, infaq and shadaqah (ZIS) that were coming into BAZIS and has been distributed to small and micro businesses through BMT. The transparency and accountability in the management of zakat, infaq and shadaqah was audited by BAZIS publication in 2003, while the transparency and accountability of the receiptment and disbursement of funds by the BMT ZIS is merely have been reported to the BAZIS. The application of information systems

used by BMT in producing such reporting and accountability of BAZIS funds have been the issue of this study.

## II. THEORETICAL FRAMEWORK

### 2.1 *The application of information systems*

According to Fauzi Usman in the material by Wiku Suryomurti[12] of information systems, information systems in the world of banking is a must, because of the demands of the information exchange speed and the storage capacity of bank information data. Fauzi Usman[15] further stated that the application in the banking system could be divided into the financial information systems, the transaction processing systems, the application processing systems, the decision management systems, the customer information system, The On Line Banking System and The Real Time Gross Settlement. The overall application system aimed to ensure the smooth operations of banks and entities.

In the present study of Almilia Luciana Spica, et al, [1], noted that the existing of information systems at the bank made it possible to know how good or bad the management of the bank organization. So it could be concluded that adequate information system applications can be seen from the satisfaction of the user and how much was information system reliability would ensure the smooth operations of banks and entities.

### 2.2 *BAZIS (Amil, Zakah, Infaq and Shadaqah Agency)*

The *Amal, Infaq and Shadaqah*(BAZIS) institution of DKI Jakarta have been established by the Governor's Decree No.D.III/B/14/6/73 on December 22, by 1973 on the establishment of Amil Zakat Infaq and Shadaqah Agency (BAZIS) of DKI Jakarta. According to Hamid Abidin, [13], as an official institution that was born and supported by the government, the BAZIS institution is a fundraiser that achieved higher receptions rather than most other institutions. Stated in the reception of the Zakat Fund recapitulation table and Shadaqah BAZIS Infaq Jakarta Province 2000-2006 (tabel.1) the potential acceptance of zakat in 2006 of Rp.4, 2 trillion, the actual revenues of Jakarta zakat 2006 was IDR 10, 9 billion or a total of 50.23% of zakat funds, infaq and Shadaqah[7].

Yusuf Qaradawi[5] in the research of Yamin Hadad, [11], states that " Moslems were only called Islam when zakat is said to have been fulfilled " indicates that the amal can encourage the growth of Islamic economy when management handed over to the official agency designated and authorized by the government. The management of zakat by BAZIS is to be called transparent in the sense of publicly if it was accessible and accountable in the sense that has been audited by public accountants.

### 2.3 *BMT Al Kareem Bazis*

In the assisted clients proposal of Bazis BMT Al Kareem [9], the history of *Baitul Maal Wat Tamwil* (BMT) Al Kareem started from the ZIS and the training of Islamic Economics in 1995 that was held in Yogyakarta. The participants from Jakarta at that time were Deni Nuryadin, SE.,M.Ikhwan and

Sulaeman Hayyun have then emerged the idea of BMT foundation. It was settled then that BMT was to be founded in Jakarta. The idea of BMT foundation was then received exciting welcome from Iwan Setiawan, S.MI, et.al. On July 15, 1995, BMT Al Kareem was established and taking place at the Pondok Indah Mosque. The spirit that emanated at that time was to assist micro and small traders in traditional markets around Pondok Indah Mosque. It was cheerful to see the development of BMT in 2009 that finally BAZIS Jakarta have entered into cooperation agreements with the BMT for the cooperation of Al Kareem which is held jointly between the BMT and BAZIS thus have changed its name into BMT Al Kareem Bazis, whereas for the management of funds provided by the ZIS BAZIS be entirely the responsibility of BMT Al Kareem and must be reported and accounted for on a periodic basis to BAZIS.

The functions that exist in the organizational structure of BMT Al Kareem Bazis had been refined in hopes of reaching the target of customer empowerment program. The organizational structure of BMT Al Kareem Bazis could be described as follows (Tabel.1):

1. Stakeholders and member meeting ,
2. Center Management Center
3. Monitoring Team,
4. BAZIS Management ,
5. Mentoring and Training

From the structure above it could be seen that the management center of BMT Al Kareem together with the management of BAZIS have conducting operations together however, in all decisions regarding the use of ZIS funds have to be discussed together.

Furthermore in the proposal of BMT target customers in 2012 [9], the direction and goals of BMT Al Kareem Bazis in the terms of customer empowerment proxies, they could be seen from the vision and mission of this organization, namely:

#### 1. Vision

To become the institute of Islamic micro entities (LKMS) that could provide reinforcement to the public empowerment of small traders to become successful entities that are always Madhani and honoring the values of Islam highly.

#### 2. Mission

In order to deliver its vision to becoming true, then BMT have missions which are:

- a. Strengthening and enhancing the economic development community through ongoing coaching and mentoring.
- b. Reducing the operation of informal lenders (rents) that sets a very high interest to small businesses, especially the working region of BMT.
- c. Making media effectively in the friendship among members of BMT BAZIS Al Kareem BMT with the parties concerned.

- d. The virtues that give the idea that made the employee in charge in it, not just living in it but can get a blessing in it.

#### 2.4. The Reporting and Accountability

In the SFAS No.101 [8], stated that the financial statements are a structured representation of the financial position and financial performance of an Islamic entity. Further stated that in addition to the financial statements, it was providing information about the financial position, financial performance and Islamic entities cash flow, the financial statements have also showed the management accountability for the use of the resources entrusted to them. SFAS No.101 [8] is a complete set of financial statements comprises the following components:

- (a) The Statements of Financial Position (Balance Sheet) at the end of period, (b) The Comprehensive Income Statement over the period, (c) The Statement of Cash Flows for the period, (d) The Report changes in equity during the period, (e) The Report of the source and use of Zakat funds during the period, (f) The Report of the sources and uses of funds during the period benevolence, (g) The Statements of financial position at the beginning of the comparative period and (h) Notes to Financial Statements containing about summary of important policy.

The information to be included in the financial statements in order to achieve the common goal of financial statements under the SFAS No.101 [8], the information containing about (1) Assets, (2) Liabilities, (3) Shirkah Funds, (4) Equity, (5) Income and Expense including gains and losses, (6) Cash Flow, (7) Zakat Fund; and the (8) Benevolent Fund. Further described in SFAS 101 [8] that the management entity who have been responsible for the preparation of sharia and Islamic entity's financial statement presentation.

### III.METHODS

#### 3.1 The Research Approach

This study uses a qualitative approach fenomenologi. According to Suprayogo[2] in the research of Yamin Hadad [11], fenomenologi approach taken to declare definitively on an object of which, according to the social actors as a reality.

#### 3.2 The Criteria for Informants

The Criteria of the informants sought in this research was expected to provide information and adequate data about the object of the study both informants who worked on BAZIS, BMT Al Kareem Bazis employees, BMT customers and those who have access to Zakat, Infaq and Shadaqah funds (ZIS) .

#### 3.3 The Analysis of Data

The data analysis performed during the process of collecting data through the series of interviews with the informants as well as when looking at comparisons with the results of previous studies.

### IV.THE RESULTS OF THE RESEARCH

According to the interviews with employees of BMT Al Kareem Bazis, which has received funding from the ZIS BAZIS some IDR 500 million (five hundred million rupiahs). The Reporting and financial accountability in the BMT BAZIS Al Kareem has been making full use of software applications (software) called the Information Systems Management Institute for Micro-Islamic entity (SIMLKMS) designed specifically for the operational needs of BMT. The software was made with the intention of making the reporting and accountability of ZIS funds in BMT Al Kareem Bazis by BMT center management and financial reporting standards set forth in SFAS No.101 [8]. The informant interviews with the employees of BMT Al Kareem Bazis noted that the software SIMLKMS have provided the modules:

- A. The Customer Service module was used to enter new customer data and customer data to update the old, making the book and passbook savings deposits and the Marketing module is used to enter data requests of customer funds managed by the marketing.
- B. The Accounting module is used by the bookkeeper to process financial data. In this module has a description of the information contained entity that consists of sharia assets, liabilities, fund shirkah, equity, revenues and expenses, contribution from and distributions to owners, cash flow, zakat funds and general funds. The Cash & Teller module used by the cash transaction to record cash flow in and out every day.
- C. The Payment administration module is used for the paymentform. Data have generated by the software called SIMLKMS in exports in the form of an Excel program to report the realization and financing of customers' bills (Fig.2).

### V.CONCLUSIONS AND THE LIMITATIONS OF THE RESEARCH

#### 5.1.The conclusions

From the above discussion it can be concluded as follows:

- A. BMT Al Kareem has been using information systems applications in the process of reporting and accountability of funds received from the ZIS BAZIS.
- B. The application of information reporting and accountability system of ZIS funds have been adequately improved the public confidence of the institutions such as BMT Al Kareem Bazis.

#### 5.2.Limitations of The Research

This study has limitations in terms of accessing the financial statements of BMT Al Kareem Bazis by using the internet, so it means that some suggestions may be given to the management as follows:

1. The Reporting and accountability of ZIS funds by BMT

Al Kareem Bazis should use the Internet as a tool of publication and it may also attracting potential customers

- The information system applications in the software have not been able to documented the contract of SIMLKMS cooperation engagement between BAZIS institution and with BMT Al Kareem Bazis and certain parties as the witnesses of akad been through.

TABEL I

THE ZAKAT, INFAQ AND SHADAQAH BAZIS FUND RECAPITULATION OF JAKARTA PROVINCE IN THE YEAR OF 2000-2006 (BILLION RUPIAHS)

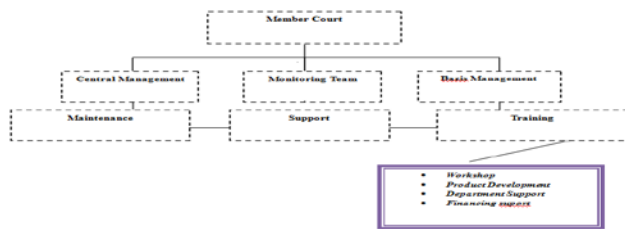
Year	ZIS Reception				Total ZIS	Growth
	Zakat	%	Infaq/Shadaqah	%		
2001	6,10	64,21	3,40	35,79	9,50	-
2006	10,90	50,23	10,80	49,77	21,70	17,30

Adapted From: M.Soekarni & Co., LIPI: 2008

- M. Soekarni, Firmansyah, M.Thoha, Sairi Erfanie, Toerdin S.Usman and Yeni Saptia." Potensi Dan Peranan Zakat Dalam Mengurangi Kemiskinan". Ringkasan Penelitian DIPA, LIPI, 2008.
- Penyajian Laporan Keuangan Syariah, IAI, ED.PSAK.101
- Proposal Bantuan Nasabah BMT Al Kareem BAZIS, 2012.
- Undang-undang No.38 Tahun 1999." Tentang Pengelolaan Zakat".
- Yamin Hadad, Disertation."Dinamika Pengelolaan Zakat Di Desa Putukrejo Gondanglegi Malang".IAIN Sunan Ampel, Surabaya, 2008.
- Wiku Suryomurti, Web-Based Application For Zakah Information Exchange: A Proposal, ISC 2011, State University of Jakarta, 2011.
- Zaim Saidi and Hamid Abidin."Menjadi Bangsa Pemurah, Wacana Dan Praktek Kederawanan Sosial Di Indonesia". Jakarta: PIRAC, Ford Foundation, 2004.
- <http://usmanfauzi.wordpress.com/>

FIGURE 1

BMT AL KAREEM BAZIS ORGANIZATIONAL CHART



Adapted From: Customer Support Proposal, BMT Al Kareem Bazis

LAPORAN PEMBIAYAAN BMT AL KAREEM BAZIS  
NOVEMBER 2011

NO.	NAMA	JENIS BUNGS	ALAMAT	PERUSAHAAN/ JENIS USAHA	PLAFOND BUNGS	MARGIN	OUTSTANDING
1	Muhammad Yusuf	MBSH	Kp. Baru Klender Rt 013/001 Jatnagara Cawang	Service Electronic	Rp. 1.500.000	Rp. 326.860	Rp. 1.173.000
2	Siti Fatmika	MBSH	Kp. Sumur No 28 Rt 07/17 Klender Duran Stant	Perdagangan Hasil Usaha	Rp. 3.000.000	Rp. 500.000	Rp. 2.500.000
3	Sunshah	MBSH	Kabon Mangga 3 Rt 05/03 Cipuler Kabayoran Lama	Perdagangan Securities	Rp. 8.000.000	Rp. 750.000	Rp. 5.750.000
4	Edison	MBSH	Cipuler Rt. 12/04 Cipuler Kabayoran Lama Jakarta	Perdagangan Imokadon Korpas	Rp. 5.000.000	Rp. 1.360.000	Rp. 4.200.000
5	Yusuf	MBSH	Kp. Pempayan Rt 04/02 Cirangkong Kec. Mekar Baru	Perdagangan hasil usaha / Jasa	Rp. 2.000.000	Rp. 240.000	Rp. 2.240.000
6	Rudi	MBSH	Kp. Ringas Bandung Rt 02/02 Harang Sambung	Perdagangan pasar PD. Jaya	Rp. 1.000.000	Rp. 240.000	Rp. 2.240.000

Figure 2 BMT Financing Report

Adapted From: BMT Al Kareem Bazis

REFERENCES

- Almilia Luciana Spica, SE.,M.Si, Irmaya Briliantien, SE. "Faktor-faktor Yang Mempengaruhi Kinerja Sistem Informasi Akuntansi Pada Bank Umum Pemerintah Di Wilayah Surabaya And Sidoarjo". STIE PERBANAS, Surabaya, 2011.
- Imam Suprayogo."Metodologi Penelitian Sosial-Agama".Bandung: PT.Rineka Cipta, 2001.
- Keputusan Menteri Agama (KMA) Nomor 581 Tahun 1999, Tentang pelaksanaan UU No. 38 Tahun 1999.
- Keputusan Gubernur Nomor 121 Tahun 2002 Tentang Pola Pengelola Zakat, Infaq And Shadaqah Badan Amil Zakat, Infaq And Shadaqah Provinsi DKI Jakarta.
- Yusuf Qardawi."Fiqh Al Zakat".Muassasat Ar-Risalah, Beirut Libanon,1973.
- Neni Sri Imaniyati."Eksistensi BMT sebagai lembaga Keuangan Syariah di Indonesia". Jurnal Hukum Pro Justitia: Vol.XXII No.4, Oktober 2004, p.71-83.

# Implementation of Modified SIRK Method on Solving Stiff Ordinary Differential Equations

Sabarina Shafie

**Abstract**—Stiff initial value problems with systems of ordinary differential equations arise from many applications in engineering and physics. This paper is focused on comprehensive derivation and implementation of a variant of the traditional Singly Implicit Runge Kutta Method for solving stiff differential equations system, which is to be called Modified Singly Implicit Runge Kutta Method (abbreviated to Modified SIRK). The method is studied for stage order up to order six. Some numerical experiments have been presented to show the potential of the approach in comparison with results by existence methods.

**Keywords**—Singly Implicit Runge Kutta, stiff equations, initial value problems, Runge Kutta

## I. INTRODUCTION

THIS paper is concerned with approximating solutions for system of first order differential equations in the form of equation (1).

$$\begin{aligned}\frac{du_1}{dt} &= f_1(t, u_1, u_2, \dots, u_n) \\ \frac{du_2}{dt} &= f_2(t, u_1, u_2, \dots, u_n) \\ &\vdots \\ \frac{du_n}{dt} &= f_n(t, u_1, u_2, \dots, u_n)\end{aligned}\quad (1)$$

for  $c \leq t \leq d$  subject to the initial conditions

$$u_1(c) = \alpha_1, u_2(c) = \alpha_2, \dots, u_n(c) = \alpha_n. \quad (2)$$

The initial value problems (IVP) (1)-(2) are assumed to have a unique solution, under some definitions of IVP stated in [1].

In the literature of numerical methods for (1), some IVP are referred as stiff problems. Since 1952, numerical methods for stiff problems have been studied extensively. One of the characteristics of these problems is that they are extremely hard to solve by standard explicit step by step methods.

The stiff problems arise from many applications in mathematics and engineering such as electrical circuits and vibrations. In conjunction with the increasing on these applications, numbers of numerical methods have been introduced and upgraded to improve the accuracy of the approximation solutions. This paper is focused on

comprehensive implementation of Modified Singly Implicit Runge Kutta Method (Modified SIRK) on solving stiff initial value problems.

Implicit Runge Kutta (IRK) formulation, which is known with ability to approximate with A-stable of stability condition for arbitrarily high-order was studied and faced problem of expensive cost for implementation. This problem then led to the search for special types of IRK methods. Part of the IRK types that have been proposed are Diagonally Implicit Runge Kutta Method by Alexander in 1977, and Singly Implicit Runge Kutta Method by Butcher and Burrage in 1976 [4],[8] and [10].

Butcher concluded that the most efficient way when using implementation of IRK are those whose characteristics polynomial of Runge Kutta matrix has a single real s-fold zero [2] and [4]. This method is then extended by Burrage in 1979 [8]. Burrage introduced two classes of methods which are Semi-Implicit Runge Kutta methods and Singly-Implicit methods. The Semi-Implicit Runge Kutta methods are methods whose Runge Kutta matrix is a lower triangular. However, disadvantage of this type of method is on difficulty to construct with large number of stage and high order. This difficulty existed as a result of requirement on modification of the order condition. The Singly-Implicit Runge Kutta (SIRK) method is a method with Runge Kutta matrix have non-lower triangular structure and a characteristic polynomial with single s-fold zero. Details on this Singly-Implicit RK method can be referred to [8].

Two years later, Burrage, Butcher and Chipman introduced an algorithm known as STRIDE, which was suggested for numerical computation of ordinary differential equations by Singly-Implicit Runge Kutta methods [7]. This algorithm was based on [8], which was corrected eight years later by Butcher [6]. In 1993, Moore and Flaherty introduced modification on implementation of SIRK which to be called as Modified SIRK in this paper [9]. Modified SIRK eliminated a linear system solution that is required in the traditional SIRK introduced by Butcher and Burrage [4] and [8]. The focus of study by Moore and Flaherty was on the implementation of Modified SIRK in time discretization of parabolic differential equations. There is no comprehensive details on derivation and implementation of Modified SIRK, as alternative in approximating stiff IVP. This paper is targeting to provide comprehensive study on derivation and implementation of Modified SIRK on solving stiff problems plus its advantages, and comparison to existed

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