

Mapping the Potential of Zakat Collection Digitally in Indonesia

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ABSTRACT

The rapid development of technology in the financial sector encourages the transformation of zakat payment from a conventional system to a digital one. However, there are several obstacles in realizing the digitization of zakat in Indonesia, both from the internal and external side of zakat management organizations (OPZ). Therefore, a strategy is needed to support the digitization of zakat. This study aims to map the potential of collecting zakat through digital means in Indonesia. It is hoped that through this research, it could describe the potential conditions of each province and become a useful blueprint in formulating zakat policies in Indonesia. The data used in this study is secondary data from BPS, Puskas Baznas and Census for 2019 period. The method used in the mapping process is K-means Cluster, while the calculation of digital zakat potential uses the Exploratory Data Analysis (EDA) method. The results of this study show that the mapping is divided into 3 clusters where cluster 1 consists of 30 provinces, cluster 2 consists of 3 provinces and cluster 3 consists of 1 province. By dividing the high, medium and low categories for each variable in every cluster, the strengths and weaknesses in each of the variables for digital zakat potential can be assessed. Further, the estimation of potential for zakat collection through digital means in Indonesia is estimated at 5,32 trillion rupiah per month or 63,93 trillion rupiah per year in 2019 where West Java Province is the province with the highest digital zakat potential. The conclusion of this research is the importance of synergies between zakat management organizations (OPZ), the community and the government. There is need to pay attention to the weaknesses and strengths of each variable per province for optimizing zakat collection through digital means in Indonesia.

Keywords: *EDA; K-Means; Potential Mapping; Zakat Collection through Digital*

INTRODUCTION

The increasingly globalized technology and information is a sign of the start of the digital economic era. Based on the report of the Institute for Development of Economics and Finance (INDEF) (2019), the digital economy in 2018 has contributed to the economy by 814 trillion rupiah or 5,5% of GDP and is projected to increase to 1,447 trillion rupiah or 6,4 % of GDP in 2024.

The presence of the digital economy does not only have an impact on the economy but also on increasingly complex social changes, ranging from changes in mindset to lifestyles due to changes in business models in various

sectors. Based on research by the Ministry of Communication and Information (2019), the financial sector is the sector that has experienced the most rapid development in line with the development of Information and Communication Technology. One of the innovations born from the financial sector is financial technology or fintech. The fintech industry as a digital platform that is developing in the field of financial services in payment activities, banking (digital banking) to other financial service support services (supporting fintech) is not only utilized by the commercial business sector but also the non-business sector that is active in fundraising activities.

One of the successful fundraising platforms in Indonesia in raising social funds through digital is Kitabisa.com. As reported by Kitabisa (2018), as much as 490 billion rupiah of funds were collected by Kitabisa.com from 17 thousand online fundraising campaigns where compared to 2017, there has been an increase of 257 billion rupiah in 2018. Kitabisa.com's success in fundraising has also encouraged Amil Zakat Agency (BAZ) and Amil Zakat Institution (LAZ) to use digital platforms in strategies to collect zakat.

The presence of technology that has begun to be adapted in activities in several zakat institutions has made the idea of "digitizing zakat" start to be implemented. Based on research from the Zakat Forum (FOZ) and Indonesian Philanthropy (2020), as many as 78% of respondents or 82 zakat management organizations (OPZ) stated their readiness to transform into the digital era. Through various digital channels, OPZ can use them in the zakat collection process. Based on Santoso's research (2019), the mechanism for digitizing zakat is divided into three parts. First, the collection of zakat through Online Zakat Payment (Website & Application), e-commerce and crowdfunding to social media platforms. Second, zakat management through blockchain technology. Third, zakat distribution through zakat distribution technology and zakat virtual assistant.

Compared to zakat management and distribution activities, zakat collection activities through digital have experienced the most rapid development and have begun to be adapted by many zakat institutions in Indonesia. This condition is supported through the presence of internal and external digital platforms in collecting zakat (Utami, 2019).

The internal digital platform is a platform developed by the Zakat Management Organization (OPZ) itself in the form of a website or application. Several forms of internal digital platforms

used by zakat institutions include Muzaki Corner from BAZNAS, BawaBerkah.org from Dompot Dhuafa, SharingHappines.org from Rumah Zakat, and ChannelKebaikan.org from Harapan Dhuafa.

Meanwhile, the external digital platform is a platform provided by partners of the Zakat Management Organization (OPZ) to collect zakat funds using technology-based zakat payment channels. There are several forms of external digital platforms. The first is in the form of e-commerce, which consists of Shopee, Tokopedia, Blibli, BukaLapak, MatahariMall, and Lazada. The second is in the form of fintech, which consists of OVO, Gopay, Link aja, M-Cash, Jenius, OY Indonesia. The third is in the form of crowdfunding consisting of Kitabisa.com. Fourth in the form of a QR code. And the fifth is in the form of social media, which consists of Facebook, Twitter, WhatsApp and LINE.

Along with the increasing number of digital platform channels, zakat payments through digital have increased from year to year. Based on BAZNAS (2020), there is an increase in the growth of zakat collection through digital by BAZNAS from year to year, which was initially 5% in 2017, then increased to 8% in 2018, then 14% in 2019 than 30% in 2020 and projected growth in 2021 is expected to reach 35%.

The use of technology in zakat collection activities is considered more efficient and optimal because muzakki can pay zakat anytime and anywhere. Meanwhile, zakat institution's operational costs are lower because the use of information and communication technology through internet networks allows information to be spread widely. This is supported by the research of Atiya et al. (2020) which analyzes the efficiency of zakat institutions and concludes that to achieve performance efficiency, technology can be utilized to increase

output in the form of the amount of zakat collected and the amount of zakat distributed.

The development of zakat collection through digital is also in line with the large zakat potential in Indonesia. Based on the report from the Center for Strategic Studies of BAZNAS (2020), the potential for zakat in 2019 based on the zakat object reached 233.84 trillion rupiah, but in 2019, the amount of zakat that could be collected was only 10.2 trillion rupiah or around 4.3% of its potential.

There is a very large difference between the potential and actual amount of zakat collected in Indonesia. Based on the research of Puskas BAZNAS (2020), the potential of zakat reached 233,84 trillion rupiah but zakat collection is around 10,23 trillion rupiah. So based on the gap that occurs, digitalization in the field of zakat collection can be an opportunity to overcome these problems. Research by Utami et al. (2020) states that the ease of paying zakat through digital platforms has a positive effect of 55.9% on zakat receipts. Considering the collaboration opportunities created between zakat and digital technology, it can be an optimal synergy in strengthening the zakat ecosystem.

However, the process of digitizing zakat in practice is still experiencing some problems. Based on the research of Utami et al. (2020) in the BAZNAS case study, it was revealed that one of the main problems of BAZNAS in an effort to maximize digitization services is the effectiveness and efficiency of operational costs and slow internet connections in Indonesia. This is supported by the 2019 Village Potential (PODES) data which notes that only 47% of provinces in Eastern Indonesia receive a signal for internet access, while another 53% can only make calls and SMS. This condition is quite different from the province in Sumatra, which since 2014 has reached 99% signal coverage.

Then observing from the internal side of the Zakat Management Organization (OPZ), based on a survey conducted by DEKS BI (2021), the obstacle that hinders practice of collecting zakat through digital is the absence of Human Resources (HR) which has the ability to operate digital media. The lack of ICT development funds in the process of collecting zakat funds through digital and the lack of support for the infrastructure or facilities owned by the OPZ is a significant barrier.

From the muzaki side, the collection of zakat through digital is not yet optimal, supported by the low ownership of bank accounts by the Indonesian people. Based on Census 2019 data, more than 50% of Indonesians do not have bank accounts, whereas on the other hand, the portion of zakat collection through digital platforms is still dominated by bank services through various digital features (DEKS BI, 2021). This condition is further worsened by the low level of public literacy regarding zakat, where the results of the Zakat Literacy Index (ILZ) 2020 are still at a level of 66.78 (moderate category) with the variable understanding of the object of zakat only 56.54 (low category) which indicates that education regarding the conception of zakat object assets still requires a better understanding. On the other hand, the potential for zakat from contemporary sources of wealth is very large considering the emergence of various types of industries and jobs, and the zakat obligations that arise as long as they meet the requirements (Strategic Study Center of the National Amil Zakat Agency (Puskas Baznas), 2020)

In the regulation, the absence of a law that specifically regulates the collection of zakat funds through digital can also lead to several practices that deviate from both the shariah side and the legal side in the form of cybercrimes such as data manipulation, system disturbances, hacking of electronic systems, theft data

and illegal access to online fraud that can harm OPZ and muzaki.

Therefore, a strategy is needed to support zakat collection activities through digital. Based on research conducted by the Ministry of Communication and Information (2019), a strategy is needed to prepare regulations in the digital economy era based on a digital activity model. The digital activity model includes social aspects, processes (regulation, business models, business processes, and governance), and technology. If applied in zakat activities, these three aspects can be viewed from the side of muzakki as a social aspect, zakat potential and zakat management conditions as aspects of the process as well as ICT development and banking access as technological aspects.

Until now there has been no study on mapping the potential for collecting zakat through digital in Indonesia. Mapping the potential of zakat through digital is also needed to encourage the development of innovation in each zakat management organization (OPZ) in each province. Equitable distribution of telecommunication infrastructure, as well as increasing the role of the government, especially in the form of regulations that support the strengthening of the digital zakat sector in Indonesia is needed.

The objective of this paper is to map the potential for collecting zakat through digital and calculating the amount of potential for collecting zakat through digital for each province. A theoretical framework was developed based on K-Means Cluster to form the variables in the mapping and Exploratory Data Analysis (EDA) to find out the number of muzaki who can access digital zakat services to be used in calculating the estimation of zakat potential through digital. Based on the objective and the background, the research questions developed are:

1. How is the mapping of zakat collection through digital in Indonesia?
2. How much amount is estimated of potential zakat collection through digital for each province?

The structure of the study is as follows. The first section describes the research background and objectives, while the second reviews the literature related to the theory of zakat, digitization aspect and muzaki. This section discusses variables that build up the mapping of zakat collection through digital and explain the criteria for digital muzaki for finding out the number of muzaki who can access zakat via digital in order to determine the potential of zakat through digital means. The third section describes the data, research method and model development. The fourth section explains the findings and analysis, while the fifth provides the research conclusions and implications.

LITERATURE REVIEW

Digital Economy

According to Dalle (2016), the history of the world economy has gone through 4 eras, namely the era of agricultural society, the era of machinery after the industrial revolution, the era of oil hunting, and the era of multinational corporate capitalism. The previous four economic waves had an exclusive character because they could only be reached by certain elite groups. Then the presence of a digital economy wave with a sloping and inclusive topography provides many opportunities for small and medium business groups to enter and compete in the global business world.

The term digital economy was first coined by Don Tapscott (1995) to describe how the internet has changed the way people do business. According to Tapscott, the internet (net) and the world wide web (web) gave rise to a new form of economy

based on the networking of human intelligence. Tapscott explained that in the old economic regime, information was in physical form, while in the digital economy era, information was in digital form.

Muzaki

Muzakki are people who are subject to the obligation to pay zakat obligations on property ownership that has reached the nishab and haul. According to Law no. 38 of 1999 concerning the management of zakat, muzakki are people or entities owned by Muslims who are obliged to pay zakat. Muzaki as zakat obligatory parties have criteria that must be met in order to be categorized as zakat obligatory assets. Sheikh Wahbah az-Zuhaili mentions the criteria for obligatory zakat as follows:

1. Muslims, both male and female
2. Have freedom, not a slave
3. The followers of Imam Hanafi provide criteria to be mature and fair because zakat is the same as other obligations (prayer, fasting, etc.)

As for al-Qardhawi (2002) mentions the criteria for wealth that is obligatory for zakat:

1. Fully owned
2. Grow
3. Enough nisab
4. More than ordinary needs (surplus basic needs)
5. Free from debt
6. Passed a year (haul)

Collection of Zakat through Digital

Fundraising is an activity to raise or collect funds carried out by an organization. According to Warwick (1999), in fundraising activities, institutions must continue to promote, educate and foster socialization, and transfer information so as to create awareness and need for potential donors. Therefore, in fundraising activities, it includes two things, namely collection activities and marketing

activities. Marketing activities are relevant when donors are notified, reminded and encouraged to donate. These activities are part of the process of influencing potential donors to do good deeds in the form of alms or donations.

Judging from the zakat fundraising strategy carried out by OPZ, Juwani (2015) grouped it into two types, namely direct fundraising and indirect fundraising. Direct fundraising is a form of fundraising that involves the participation of muzakki. There are indirect methods of fundraising where the methods of raising funds that do not directly respond to muzakki. This method, for example, is carried out with a promotional method that leads to the formation of a strong institutional image, without being directed to donate at that time.

In practice, zakat fundraising through digital in Indonesia can be done in several ways. Based on Santoso's research (2019), several channels or channels used in fundraising include internal platforms consisting of internal institution websites and external platforms consisting of e-commerce, crowdfunding, digital payment cards/machines and e-wallet.

Information and Communication Technology Development Index (IP-ICT)

The Information and Communication Technology Development Index (IP-ICT) is a standard measure prepared by the Central Statistics Agency (BPS) which describes the level of ICT development of a region at a time. It measures the digital divide and informs the potential for ICT development. By referring to the methodology of the International Telecommunication Union (ITU), BPS calculates IP-TIK at the national and provincial levels, where IP-TIK itself is a composite index with weights compiled by 11 indicators and 3 sub-indices, namely the access and infrastructure sub-index, sub-index usage, and expertise sub-index. (BPS, 2020)

National Zakat Index

The National Zakat Index (IZN) is a measuring tool compiled by the Center for Strategic Studies of BAZNAS in 2016. The purpose of the establishment of the IZN is to evaluate the condition of zakat at the provincial and national levels per year. Through IZN, it is expected to be an indicator or an illustration of how the role of zakat affects the welfare of mustahiq. How the condition of zakat managers in each province is affected, both internally and institutionally and how community participation and support from local governments plays a role. (BAZNAS, 2016)

IZN preparation uses research based on Mixed Methods. Mixed methods research is a research methodology that combines qualitative and quantitative methods in the process of collecting, analyzing and integrating data. The NZI component is generally formed by two dimensions, namely the macro dimension and the micro dimension. The indicators are 5 and the variables are 13. (BAZNAS, 2016)

Potential Zakat Based on the Object of Zakat

The Zakat Potential Mapping Indicator (IPPZ) is a measurement tool for calculating the zakat potential of an area that includes all potential zakat objects. This indicator is the result of calculations carried out by Puskas Baznas in 2019. The IPPZ consists of seven main components, namely potential agricultural zakat, livestock zakat, money zakat, income zakat, and corporate zakat.

The methodology used in compiling the Zakat Potential Mapping Indicator (IPPZ) is a quantitative approach. A quantitative approach is used to test the data through a series of calculation methods. IPPZ is calculated by

utilizing secondary data taken from various official sources, such as the Central Statistics Agency (both central and provincial) and references from other institutions/agencies.

The amount of each potential zakat is: agricultural zakat of 19.79 trillion rupiahs, livestock zakat of 9.51 trillion rupiahs, cash zakat of 58.76 trillion rupiahs, corporate zakat of 6.71 trillion rupiahs and income zakat of 139.07 trillion rupiah. The total of the five potential zakat based on the object of zakat is 233.8 trillion rupiah (Puskas BAZNAS, 2019)

Previous Studies

Research on mapping the potential of zakat has previously been carried out by the Center for Strategic Studies (Puskas) of BAZNAS (2020) with the research title of Mapping Indicators of Zakat Potential (IPPZ). The study divides the potential of zakat based on the object of zakat, namely agricultural zakat, livestock zakat, money zakat, corporate zakat and income zakat with a scope of 34 provinces in Indonesia. By using secondary data sources consisting of the Central Statistics Agency (BPS), the Ministry of Agriculture's Center for Data and Information and the Financial Services Authority (OJK). The method used is a quantitative method with simple arithmetic calculations that refers to the calculation of zakat. The study resulted in a total calculation of the potential for zakat amounting to 233.8 trillion rupiah.

Further research related to mapping was also carried out by Abdullah Ahsan and Nur Hadi Wiyono (2009) who mapped the number of mustahiq, muzaki and the potential for regional empowerment to the district level in all provinces of Indonesia. By using the 2007 National Socio-Economic Survey (Census) data in mapping muzaki and mustahiq and 2008 Village Potential (Podes) data to map village potential, the data is processed using the EDA method and presented through the Geographical Information

System (GIS). The results of this study are the division of muzaki and mustahiq categories for each province and determine the percentage of each village in maintaining the poverty alleviation program.

Mapping research by forming separate variables was carried out by Ascarya (2017) in his research related to mapping the potential of Islamic banking in Indonesia and its development strategy. The data used is secondary data with multinomial logit method and biplot analysis. In the mapping process, a model is built with 3 variables, namely demographic, economic and social variables. The estimation results of the model show that the variables that significantly affect the development potential of Islamic banks are region, population density, banking, third party funds (DPK), number of senior high schools (SLTA), location index, percentage of Muslim population, and percentage of PPP and PPP voters. This study shows that of the 348 districts/cities observed, 19% (66 regions) have very high potential, 8.9% (31 regions) have high potential, 13.2% (47 regions) have sufficient potential, and 58.9% (204 regions) have low potential. Areas with

very high and high potential are mostly located on the island of Java

Research related to K means has been carried out by S. Ramadani, I. Ambarita, AMH Pardede (2019) in mapping the poor community in the case study of the city of Binjai, with observed variables such as the education level of the head of the household, the education level of housewives, occupation, number of family members, and other variables that are observed to affect poverty. By using BPS data from 2016-2017 as well as the K means method, the result is that the grouping is divided into 3 with the number of each cluster consisting of various cities.

Conceptual Framework

Several studies on zakat potential that have been done previously by Firdaus et al. (2012) who estimated that the national zakat potential was reaching Rp. 217 trillion (3.4% of 2010 GDP), Wibisono (2015) who estimated the national zakat potential of Rp. 106.6 trillion (1.7% of 2010 GDP) and Puskas BAZNAS (2020) which estimates the zakat potential of 233, 84 trillion rupiah. This study focuses on the digital aspects inherent in zakat collection activities.

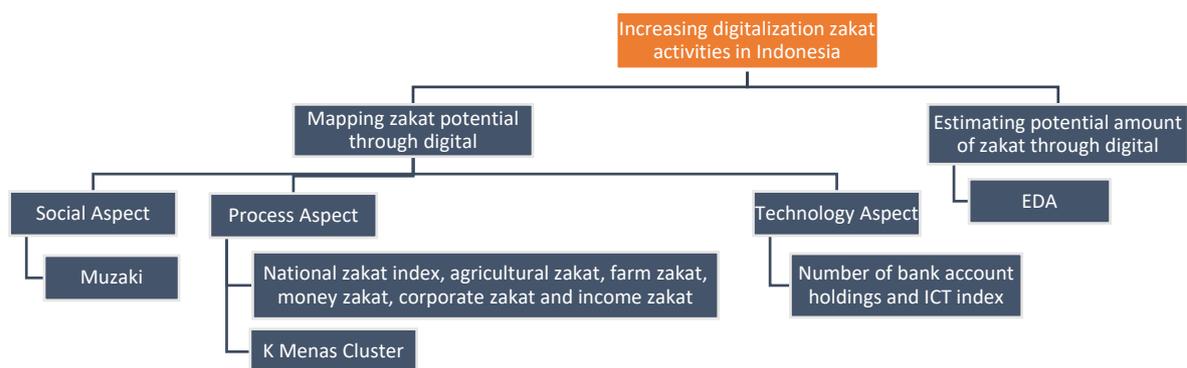


Figure 1. Conceptual Framework

Source: Authors' Own.

Therefore, this study builds a model with variables forming the collection of zakat through digital to

determine the mapping of the potential of digital zakat and to find the number of muzaki who have access to digital zakat

services to determine the estimated amount of zakat that can be collected through digital. Figure 1 illustrates the researcher's framework with two research objectives, namely mapping and estimating the potential for zakat through digital.

METHODOLOGY

Data

This study uses secondary data obtained from official publications at the relevant agencies. The data used are annual data per province for the 2019 period. In Table 1, the types of secondary data are presented along with the data sources used by researchers.

Table 1. Data and source

<i>Data</i>	<i>Description</i>	<i>Source</i>
Muzaki	The number of Muslim populations aged 15 years and over and has worked whose income has reached the nisab.	Census 2019 processed
ICT index	An index that describes the level of ICT development by province.	Badan Pusat Statistik 2019
Number of bank account holdings	Percentage of account ownership per province which is calculated by comparing the number of residents who have accounts divided by the total Muslim population.	Census 2019 processed
Agricultural zakat,	Zakat imposed on staple foods and plantations is calculated by determining the production of rice and plantation products and multiplying the price of the commodity with the zakat rate of 5% and adjust it by the percentage of the Muslim population.	Zakat Potential Mapping Indicators, BAZNAS 2020
Farm zakat	Zakat imposed on livestock and non-livestock is calculated by multiplying the price with the zakat rate and adjust it by the percentage of the Muslim population.	Zakat Potential Mapping Indicators, BAZNAS 2020
Money zakat,	Zakat imposed on deposits is calculated by multiplying the amount of deposits by the zakat rate of 2.5% and adjust it by the percentage of the Muslim population.	Zakat Potential Mapping Indicators, BAZNAS 2020
Corporate zakat	Zakat issued by a business entity from profits or profits earned for one year multiplied by the zakat rate of 2.5%.	Zakat Potential Mapping Indicators, BAZNAS 2020
Income zakat	Zakat from the income of residents who work for 1 (one) year both ASN and non ASN is calculated by taking the value of income and multiply it by the zakat rate of 2.5% and adjust it by the percentage of the Muslim population.	Zakat Potential Mapping Indicators, BAZNAS 2020
National Zakat Index	An index that measures the development of national zakat conditions per province assessed from micro and macro dimensions.	National Zakat Index (IZN), BAZNAS 2019

Method

1. K means Cluster

Cluster analysis is a statistical method that identifies groups of samples based on similar characteristics. Cluster analysis groups similar elements as research objects that have a high level of homogeneity between objects into different clusters with a high level of object heterogeneity

between clusters. K-means clustering is one of the non-hierarchical data clustering methods that group data in the form of one or more clusters/groups. Data that has the same characteristics are grouped into one cluster/group and data that has different characteristics is grouped with other clusters/groups so that data that is in one cluster/group has a small level of variation

(Agusta, 2007). The steps for clustering using the K-Means method are as follows:

1) *Variable Standardization or Transformation*

Variable standardization is carried out if there is a large difference in unit values between variables. For example, some are in units of millions, and some are in tens or even smaller units. Large data differences will cause the calculation to be invalid so the data must be transformed. The transformation can be done by the min-max method. Min-max is part of the data normalization method where the process maps a value v from attribute A to v' into the range $[\text{new_min}_A, \text{new_max}_A]$ based on the formula:

$$v' = \frac{v - \text{min}_A}{\text{max}_A - \text{min}_A} (\text{new_max}_A - \text{new_min}_A) + \text{new_min}_A$$

where,

v' = the value resulting from the standardization process

v = value used

min_A = the lowest value of the data set attribute A

max_A = the highest value of the attribute data set A

2) *Determine the number of clusters k .*

In determining the number of clusters, the calculation can be done by various methods. In this study, the optimal number of clusters was determined from the smallest value of the Davies Bouldin Index (DBI) evaluation.

3) *Determine the k Centroid (central point of the cluster)*

$$v = \frac{\sum_{i=1}^n x_i}{n}$$

where,

v = centroid on cluster

x_i = object i , $i = 1, 2, 3, \dots, n$

n = the number of objects/ number of objects that are members of the cluster.

4) *Measurement of the Concept of the Similarity of Distances between Objects*

Before the clustering process, a distance measure is used to find out how similar or different the objects studied are using the Euclidean distance. The smaller/shorter the distance between objects, the more similar the object is to other objects. Euclidean distance is the distance between the object under study. Prasetyo (2014) states that the Euclidean distance is a measure of the distance that can provide the closest distance between two data. This can be seen through the equation below

$$d_{ij} = \sqrt{\sum_{k=1}^p (x_{ik} - x_{jk})^2}$$

where:

d_{ij} = distance between object i and object j

p = number of cluster variables

x_{ik} = data from the i -th subject on the k -th variable

x_{jk} = data from the j -th subject on the k -th variable

k = 1, 2, 3, ... , n

i = 1, 2, 3, ... , n

j = 1, 2, 3, ... , n

5) *Allocate all data or objects to the nearest cluster.*

The proximity of two objects is determined based on the distance between the two objects. Likewise, the proximity of a data to a particular cluster is determined by the distance between the data and the center of the cluster.

6) *Calculate the cluster center with the membership of the formed cluster.*

Cluster center is the average of all data/objects in a particular cluster. If desired, you can also use the average (mean) of the cluster.

2. Exploratory Data Analysis (EDA)

Exploratory Data Analysis (EDA) is a data exploration method using simple arithmetic techniques and graphic techniques in summarizing observational data (Martinez, 2017). Exploratory data analysis is very supportive in studying and discovering the properties of the data which can later be useful in selecting the right statistical model. Thus, in exploratory data analysis, it is the nature of the observational data that will determine the appropriate statistical analysis model (or improvement of the planned analysis). In Cox (2017), the uses, graphic techniques and stages of Exploratory Data Analysis (EDA) are explained. Among the several uses of EDA include maximizing data analysis, searching for hidden data structures (unveiling hidden mysteries), removing important variables, detecting abnormalities and anomalies, testing assumptions, building models and optimizing.

Most EDA techniques are graphical with some quantitative techniques. The main role of EDA is to explore data openly, and the use of graphs can strengthen the analysis carried out. The Exploratory Data Analysis (EDA) has 5 stages, namely

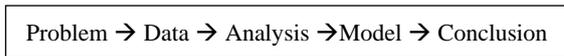


Figure 2. Steps of EDA (Cox 2017)

Model Development

1. K Means Cluster Model Development

The variables used in the formation of the mapping of potential zakat collection through digital in Indonesia are cross sectional data for the 2019 period which consists of:

- X₁ = agriculture zakat
- X₂ = farm zakat
- X₃ = money zakat
- X₄ = corporate zakat
- X₅ = income zakat
- X₆ = Number of bank account holdings
- X₇ = National Zakat Indeks
- X₈ = ICT Indeks
- X₉ = Muzaki

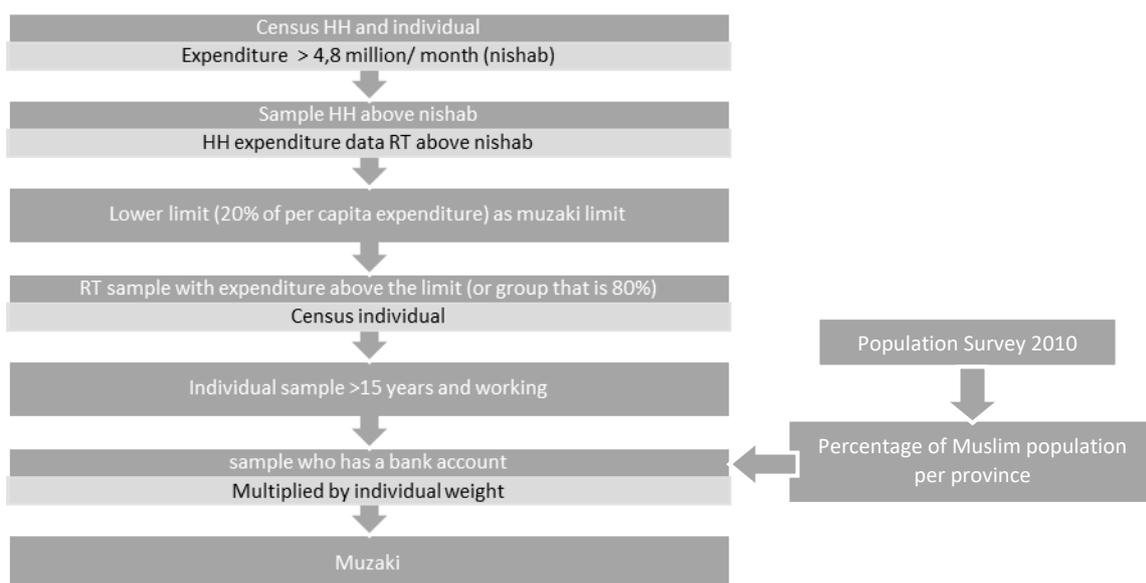


Figure 3. Muzaki calculation process (Modified from Ahsan et.al (2009))

In calculating the potential amount of zakat, the steps that need to be taken are calculating the number of muzaki who have bank accounts as a proxy for accessing to digital zakat services. The data is sourced from the 2019 Census. The calculation flow can be seen in Figure 4

The following are the stages of the process of calculating the number of Muzaki using Census 2019 data:

1. Set the Nishab of 4,821,418 rupiah / month based on the gold price in 2019 of 680,607 rupiah.
2. Taking a sample of households with per capita expenditures above the nishab.
3. Sort the expenditure data on a sample of households above the nishab from highest to lowest.
4. Set a lower limit of 20% of household per capita expenditure as a muzakki limit for urban and rural areas. Determination of the lower limit of expenditure of 20% of household per capita expenditure based on expert judgment by considering the poverty line (Ahsan, *et.al*, 2009)
5. Take a sample of all households that have expenditures above the limit.
6. Counting the number of individuals (15 years and working status) as muzakki criteria from individual Census data.
7. Take a sample of the number of individuals who have bank accounts.

8. Multiplying the correction factor or the percentage of the Muslim population from the 2010 population survey data.
9. Multiplying muzaki samples with individual weights in the 2019 Census.
10. Get the number of individual muzaki per province.

RESULT AND DISCUSSION

Mapping the Potential for Zakat Collection through Digital in Indonesia

This research was conducted using 2019 data consisting of potential zakat on agriculture, livestock, money, income and companies sourced from the Zakat Potential Mapping Indicator Book (IPPZ) (Puskas Baznas, 2020), IP-TIK (BPS, 2019), IZN (Puskas Baznas, 2019), the number of muzakki and the number of account ownership (Census 2019). Based on the mapping method, the first step is to standardize the data.

Standardization is a step taken to make data that has various ranges to conform to the same range. The standardization used in this study is the min-max scaler where Min-Max Scaling works by scaling the data by adjusting the data within a certain range or range.

Table 2. Data after standardization

<i>Province</i>	<i>Agriculture Zakat</i>	<i>Farm Zakat</i>	<i>Money Zakat</i>	<i>Corporate zakat</i>	<i>Income Zakat</i>	<i>Bank Account</i>	<i>National Zakat Index</i>	<i>ICT Index</i>	<i>Muzaki</i>
Aceh	0,239	0,144	0,007	0,160	0,059	0,090	0,719	0,392	0,084
Nort Sumatera	0,475	0,120	0,055	0,310	0,208	0,242	0,406	0,467	0,171
West Sumatera	0,246	0,124	0,009	0,074	0,091	0,104	0,438	0,480	0,117
Riau	0,308	0,101	0,018	0,175	0,261	0,123	0,688	0,503	0,138
Jambi	0,156	0,052	0,007	0,089	0,084	0,044	0,719	0,460	0,058
South Sumatera	0,576	0,087	0,005	0,157	0,173	0,107	0,656	0,394	0,125
Bengkulu	0,098	0,043	0,002	0,040	0,026	0,020	0,281	0,470	0,033
Lampung	0,311	0,126	0,010	0,058	0,140	0,138	0,406	0,374	0,102
Kep. Bangka Belitung	0,026	0,076	0,009	0,000	0,026	0,008	0,688	0,480	0,044
Kep. Riau	0,004	0,104	0,024	0,002	0,072	0,045	0,688	0,769	0,064
DKI Jakarta	0,000	0,032	1,000	0,606	0,886	0,358	0,938	1,000	0,384
West Java	0,921	0,485	0,121	1,000	0,744	1,000	0,719	0,636	1,000

Province	Agriculture Zakat	Farm Zakat	Money Zakat	Corporate zakat	Income Zakat	Bank Account	National Zakat Index	ICT Index	Muzaki
Central Java	0,848	0,439	0,073	0,651	0,575	0,790	0,656	0,545	0,489
DIY	0,044	0,051	0,013	0,022	0,058	0,110	0,625	0,899	0,080
East Java	1,000	1,000	0,157	0,694	1,000	0,776	0,344	0,543	0,649
Banten	0,152	0,130	0,033	0,046	0,224	0,231	0,813	0,643	0,351
Bali	0,010	0,012	0,026	0,039	0,013	0,104	0,000	0,731	0,015
West Nusa Tenggara	0,127	0,388	0,005	0,096	0,049	0,066	1,000	0,377	0,075
East Nusa Tenggara	0,008	0,024	0,005	0,076	0,000	0,085	0,219	0,206	0,000
West Kalimantan	0,107	0,043	0,012	0,157	0,046	0,080	0,750	0,354	0,056
Central Kalimantan	0,158	0,012	0,003	0,000	0,042	0,036	0,375	0,472	0,048
South Kalimantan	0,178	0,133	0,001	0,039	0,072	0,066	0,969	0,515	0,088
East Kalimantan	0,088	0,039	0,002	0,100	0,215	0,096	0,438	0,736	0,112
North Kalimantan	0,011	0,007	0,000	0,009	0,017	0,003	0,063	0,646	0,011
North Sulawesi	0,015	0,031	0,005	0,045	0,011	0,032	0,406	0,508	0,013
Central Sulawesi	0,132	0,098	0,003	0,023	0,047	0,036	0,594	0,362	0,035
South Sulawesi	0,566	0,349	0,020	0,213	0,157	0,193	0,781	0,475	0,134
Southeast Sulawesi	0,095	0,091	0,000	0,052	0,043	0,040	0,563	0,460	0,044
Gorontalo	0,095	0,035	0,003	0,000	0,012	0,005	0,469	0,410	0,017
West Sulawesi	0,062	0,017	0,000	0,000	0,012	0,002	0,094	0,259	0,008
Maluku	0,009	0,045	0,003	0,049	0,005	0,011	0,000	0,362	0,010
North Maluku	0,014	0,029	0,001	0,000	0,007	0,000	0,344	0,254	0,012
West Papua	0,002	0,010	0,001	0,003	0,008	0,007	0,219	0,467	0,007
Papua	0,003	0,000	0,003	0,105	0,012	0,038	0,250	0,000	0,010

Source: processed data from Python output

Table 2 shows the data after standardization. Seen changes in the data that has been standardized which produces data with a range of 0 to 1. The next step is to determine the number of clusters. In the K-Means Cluster method, the number of

clusters to be formed is not determined. So, to evaluate the optimal number of clusters, the Davis Bouldin Index (DBI) value is used. The smaller the selected DBI value, the better the number of clusters formed.

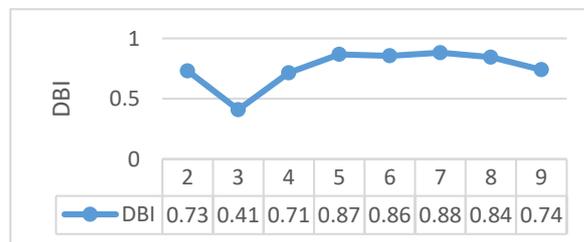


Figure 4. Optimal cluster graph with DBI (Source: processed data from Python output)

Based on Figure 4 the results of data processing, the optimum value for the

number of clusters is 3 clusters with the lowest DBI value of 0.409.

Table 3. Centroid value for each cluster

	Agriculture Zakat	Farm Zakat	Money Zakat	Corporate zakat	Income Zakat	Bank Acoount	National Zakat Index	ICT Index	Muzaki
Cluster 1	0	0.031	1	0.606	0.886	0.357	0.937	1	0.384
Cluster 2	0.922	0.641	0.116	0.781	0.772	0.855	0.572	0.574	0.712
Cluster 3	0.143	0.083	0.009	0.071	0.072	0.072	0.488	0.464	0.068

Table 4. Euclidean distance for each cluster

Province	Distance Cluster 1	Distance Cluster 2	Distance Cluster 3
Aceh	1,630	0,281	1,587
Nort Sumatera	1,314	0,483	1,516
West Sumatera	1,628	0,136	1,620

<i>Province</i>	<i>Distance Cluster 1</i>	<i>Distance Cluster 2</i>	<i>Distance Cluster 3</i>
Riau	1,481	0,487	1,437
Jambi	1,738	0,235	1,570
South Sumatera	1,461	0,491	1,616
Bengkulu	1,848	0,232	1,736
Lampung	1,591	0,233	1,657
Kep. Bangka Belitung	1,868	0,256	1,632
Kep. Riau	1,835	0,397	1,516
DKI Jakarta	1,647	1,619	0
West Java	0,448	1,975	1,724
Central Java	0,408	1,393	1,525
Di Yogyakarta	1,811	0,472	1,504
East Java	0,509	1,923	1,864
Banten	1,512	0,517	1,371
Bali	1,942	0,584	1,784
West Nusa Tenggara	1,719	0,602	1,633
East Nusa Tenggara	1,920	0,414	1,850
West Kalimantan	1,751	0,302	1,591
Central Kalimantan	1,817	0,161	1,706
South Kalimantan	1,744	0,488	1,559
East Kalimantan	1,682	0,324	1,474
North Kalimantan	1,975	0,503	1,808
North Sulawesi	1,879	0,192	1,685
Central Sulawesi	1,792	0,165	1,676
South Sulawesi	1,323	0,617	1,567
Southeast Sulawesi	1,786	0,104	1,636
Gorontalo	1,870	0,155	1,721
West Sulawesi	1,972	0,476	1,914
Maluku	1,977	0,530	1,905
North Maluku	1,947	0,321	1,821
West Papua	1,950	0,339	1,788
Papua	1,975	0,555	1,929

Source: processed data from Python output

Based on the optimal number of clusters and the calculation of the Euclidean distance formed, the results of the provincial clustering based on the K-Means method show that the mapping of zakat collection through digital in Indonesia is divided into 3 clusters as presented in Table 5. Cluster 1 has the

most members, consisted of 30 provinces with members from all provinces in Indonesia except for the provinces of West Java, Central Java, East Java and DKI Jakarta. While group 2 has members from 3 provinces, namely West Java, Central Java and East Java, and group 3 only has 1 member, namely DKI Jakarta.

Table 5. Results of cluster analysis of zakat collection variables through digital in Indonesia

<i>Cluster</i>	<i>Provinces</i>	<i>Number of Members</i>
1	Aceh, North Sumatera, West Sumatera, Riau, Jambi, South Sumatera, Bengkulu, Lampung, Kep. Bangka Belitung, Kep. Riau, DI Yogyakarta, Banten, Bali, West Nusa Tenggara, East Nusa Tenggara, West Kalimantan, Central Kalimantan, South Kalimantan, East Kalimantan, North Kalimantan, North Sulawesi, Central Sulawesi, South Sulawesi, Southeast Sulawesi, Gorontalo, West Sulawesi, Maluku, North Maluku, West Papua and Papua	30
2	West Java, Central Java, and East Java	3

<i>Cluster</i>	<i>Provinces</i>	<i>Number of Members</i>
3	DKI Jakarta	1

Source: processed data from Python output

As for calculating the center of the cluster with the membership of the formed

cluster, the average value (mean) of the cluster is used as presented in Table 6.

Table 6. Mean value of each variable from the results of clustering

<i>Variables</i>	<i>Cluster</i>		
	<i>1</i>	<i>2</i>	<i>3</i>
Agriculture Zakat (billion rupiah)	30,6	196,06	0,07
Farm Zakat (billion rupiah)	8,11	59,55	3,29
Money Zakat (billion rupiah)	344,77	4194,87	35836,4
Corporate zakat (billion rupiah)	6,29	68,03	52,8
Income Zakat (billion rupiah)	1936,61	19532,13	22375,50
Muzakki (people)	467485	4585775	2485631
National Zakat Index (index)	0,61	0,63	0,75
ICT Index (index)	5,18	5,62	7,31
Number of Bank Account	1.131.725	10.647.074	4.604.768

Source: processed data from Python output

The clusters formed as a result of processing have inter-cluster characteristics, as follows:

- Cluster 1: In this cluster, it was found that with the lowest average number of potential muzakki, this cluster produced a fairly low average amount of zakat on agriculture and farm. In addition, this cluster also has a much smaller average of corporate zakat, income zakat, number of bank accounts, and money zakat as compared to other clusters. So it can be concluded that this cluster is a cluster that has the overall characteristics of the variables with the smallest value when compared to other clusters.
- Cluster 2: With the highest average number of muzakki, this cluster has the highest average zakat on farm and agriculture compared to other clusters. In addition, the average corporate zakat, and the number of accounts in this cluster have a relatively high value like cluster 3. It can be concluded that this cluster is a cluster that has primacy in all zakat

object variables except money zakat and has advantages in the number of muzaki and the number of bank account ownership compared to clusters 1 and 3.

- Cluster 3: This cluster only has one member, which is DKI Jakarta province but has a number of potential muzaki which is half of the average muzakki potential in cluster 2. However, this cluster has components of zakat money, income and corporate which are quite high while the components of zakat on agriculture and farm are very small. So it can be concluded that this cluster is a regional cluster that relies heavily on zakat income, money and corporate zakat.

In determining which variables are categorized as low, medium and high in each cluster, a numerical frequency distribution method is used, which is arranged based on intervals. The range is divided by the number of classes, resulting in the length of the class. Cluster intervals for each variable forming zakat collection through digital are presented in Table 7.

As shown in Table 7, each variable in each mean of the variables. cluster is categorized according to the

Table 7. Frequency distribution by category

Variable	Category		
	Low	Medium	High
Agriculture Zakat (billion rupiah)	m<65,405	65,405<m<130,745	m>130,745
Farm Zakat (billion rupiah)	m<22,045	22,045<m<40,805	m>40,805
Money Zakat (billion rupiah)	m<12.175,315	12.175,315<m<24.005,865	m>24.005,865
Corporate zakat (billion rupiah)	m<26,875	26,875<m<47,465	m>47,465
Income zakat (billion rupiah)	m<8.749,575	8.749,575<m<15.562,545	m>15.562,545
Muzakki (people)	m<1.840.248	1.840.248<m<3.213.012	m>3.213.012
National Zakat Index (index)	m<0,661	0,661>m<0,717	m>0,717
ICT Index (index)	m<5,4	5,4<m<6,21	m>6,21
Number of Bank Account	m<4.303.508	4.303.508<m<7.475.292	m>7.475.292

Source: processed data output from Ms. Excel

Table 8. Category frequency distribution by cluster

Category	Cluster		
	1	2	3
Agriculture Zakat	Low	High	Low
Farm Zakat	Low	High	Low
Money Zakat	Low	Low	High
Corporate zakat	Low	High	High
Income zakat	Low	High	High
Muzakki	Low	High	Medium
National Zakat Index	Low	Low	High
ICT Index	Low	Medium	High
Number of Bank Account	Low	High	Medium

Source: Author's own

In cluster 1, all the variables are included in the low category, while in cluster 2 there are 6 variables that are included in the high category, 1 variable which is included in the medium category and 2 variables that are included in the low category. As for cluster 3, there are 5 variables included in the high category, 2 variables included in the medium category and 2 variables are included in the low category.

Potential Zakat through Digital in Indonesia

To find out the potential amount of muzakki per individual who have a bank account as a proxy for access to digital zakat collection. The selection of bank account ownership proxies to represent access to zakat through digital is based on research from the Department of Economics and Sharia Finance of Bank Indonesia (2021) which states that the digital platform used to collect zakat is dominated by banking services with 61.8% and the remaining by Mobile Apps 7%, Crowdfunding 6.5% and e-commerce 4%. Therefore, in this study, we will first look for muzaki who have the bank account attached in Table 9.

Table 9. The number of potential muzaki with accounts per province based on the 2019 Census

Provinsi	Jumlah Muzaki (orang)	Provinsi	Jumlah Muzaki (orang)
Aceh	377.881	West Nusa Tenggara	323.327

<i>Provinsi</i>	<i>Jumlah Muzaki (orang)</i>	<i>Provinsi</i>	<i>Jumlah Muzaki (orang)</i>
Nort Sumatera	720.284	East Nusa Tenggara	20.681
West Sumatera	519.849	West Kalimantan	261.021
Riau	610.283	Central Kalimantan	217.843
Jambi	257.494	South Kalimantan	396.335
South Sumatera	506.418	East Kalimantan	588.968
Bengkulu	163.496	North Kalimantan	71.377
Lampung	427.827	North Sulawesi	77.307
Kep. Bangka Belitung	168.299	Central Sulawesi	173.462
Kep. Riau	363.796	South Sulawesi	655.377
DKI Jakarta	2.065.362	Southeast Sulawesi	237.113
West Java	4.687.023	Gorontalo	96.561
Central Java	2.188.294	West Sulawesi	60.294
Di Yogyakarta	420.865	Maluku	65.039
East Java	2.825.403	North Maluku	73.820
Banten	1.617.327	West Papua	51.060
Bali	92.905	Papua	56.235
Total		21.438.626	

Source: processed data from Python output

From the calculation of potential muzakki who have accounts using Census data in 2019, the number of potential muzakki at the national level is 21,438,626 people, where West Java Province is the province with the highest potential for muzakki, i.e. 4,687,023 people. East Nusa Tenggara Province is the province with the potential for muzakki who have the lowest bank account with as many as 20,681 people.

To find out the potential amount of zakat through digital based on the potential of muzakki who have bank accounts, this section will calculate the potential for collecting zakat through digital medium province wise. The selection of bank account ownership proxies is based on zakat digitization activities, one of which is zakat collection, which is dominated by banking services (DEKS, 2021). The formula used to calculate zakat potential through digital is:

Potential Zakat through digital

$$= (M_1 \times P_1 \times \text{zakat rate}) \\ + (M_2 \times P_2 \times \text{zakat rate})$$

where,

M_1 = urban muzakki in city who have a bank account (people)

M_2 = rural muzakki who have a bank account (people)

P_1 = Average income of urban muzakki who have a bank account (rupiah)

P_2 = Average income of rural muzakki who have a bank account (rupiah)

Zakat tariff = 2,5%

Table 10 presents the potential for urban and rural muzakki who have bank accounts, the income of muzakki in cities and villages who have bank accounts and the amount of potential zakat through digital which has been calculated based on the above formula.

Table 10. Potential Zakat through Digital Medium

<i>Province</i>	<i>M1* (people)</i>	<i>M2*(people)</i>	<i>P1* (rupiah)</i>	<i>P2* (rupiah)</i>	<i>Potential Zakat through Digital per month (rupiah)</i>
Aceh	220.061	157.820	10.042.299	7.527.440	84.947.480.325
Nort Sumatera	518.074	202.210	9.657.438	7.606.171	163.532.789.968

Province	M1* (people)	M2*(people)	P1* (rupiah)	P2* (rupiah)	Potential Zakat through Digital per month (rupiah)
West Sumatera	352.807	167.042	9.381.454	8.330.945	117.536.518.101
Riau	352.692	257.591	10.243.472	7.706.042	139.944.949.819
Jambi	146.702	110.792	9.328.213	7.612.425	55.296.583.759
South Sumatera	322.559	183.859	9.572.424	7.384.181	111.132.997.922
Bengkulu	98.762	64.734	10.141.954	7.760.132	37.599.602.801
Lampung	247.984	179.843	9.146.693	7.658.424	91.138.693.825
Kep. Bangka Belitung	120.443	47.856	9.066.181	7.969.480	36.833.639.497
Kep. Riau	349.567	14.229	10.311.819	7.013.845	92.611.791.845
DKI Jakarta	2.065.362		12.736.308		657.627.185.183
West Java	4.232.708	454.315	10.670.043	7.866.624	1.218.427.619.901
Central Java	1.507.117	6.811.77	9.186.191	7.892.214	480.516.498.579
Di Yogyakarta	359.570	61.295	10.449.952	7.450.505	105.354.203.100
East Java	2.174.798	650.605	9.784.503	8.066.358	663.183.290.809
Banten	1.422.446	194.881	10.638.869	8.444.719	419.473.334.288
Bali	74.230	18.675	10.279.869	8.805.033	23.187.717.726
West Nusa Tenggara	202.977	120.350	10.066.584	7.991.833	75.127.556.822
East Nusa Tenggara	120.50	8.631	10.227.354	8.899.323	5.001.242.130
West Kalimantan	155.040	105.981	10.107.256	7.690.495	59.551.887.057
Central Kalimantan	118.375	99.468	10.536.669	8.029.596	51.149.155.686
South Kalimantan	267.776	128.559	10.344.280	7.769.161	94.218.644.107
East Kalimantan	446.202	142.766	10.192.278	8.575.145	144.301.359.686
North Kalimantan	51.840	19.537	9.954.889	8.741.892	17.171.294.967
North Sulawesi	54.528	22.779	9.604.690	8.765.550	18.084.875.958
Central Sulawesi	105.817	67.645	9.483.676	8.038.249	38.682.038.241
South Sulawesi	436.335	219.042	11.329.234	8.243.589	168.725.843.315
Southeast Sulawesi	146.285	90.828	11.308.584	8.263.202	60.120.159.173
Gorontalo	59.147	37.414	10.249.264	8.158.241	22.786.142.911
West Sulawesi	27.157	33.137	11.318.462	7.724.326	14.083.411.823
Maluku	51.010	14.029	10.493.726	8.237.728	16.271.301.996
North Maluku	49.622	24.198	10.687.415	7.852.041	18.008.365.882
West Papua	27.543	23.517	11.303.395	9.728.601	13.502.923.564
Papua	33.548	22.687	9.759.129	8.461.851	12.984.332.320
Total of Zakat Potential through Digital					5.328.115.433.102

Source: processed data output from Ms. Excel

Legends:

M₁: urban muzaki in city who have a bank account (people)

M₂: rural muzaki who have a bank account (people)

P₁: Average income of urban muzaki who have a bank account (rupiah)

P₂: Average income of rural muzaki who have a bank account (rupiah)

Based on Table 10, the total potential for zakat through digital in Indonesia in 2019 is 5,328 trillion rupiah per month or if it is calculated for a year, it is 63,937 trillion rupiah. The biggest potential for zakat through digital is in West Java Province, amounting to 1.218 trillion rupiah, with the number of city and village muzaki with bank accounts comprising 4,687,023 people. Meanwhile,

the province with the lowest potential for zakat through digital is East Nusa Tenggara with 5,001 billion rupiah, with city and village muzaki with bank accounts comprising 20,681 people. If ranked, the 5 highest provinces with highest potential in collecting zakat through digital can be seen in Table 11 below:

Table 11. Provinces with the highest potential for collecting zakat through digital.

No	Province	Amount of Zakat Potential through Digital (rupiah)
1	West Java	1.218.427.619.901

No	Province	Amount of Zakat Potential through Digital (rupiah)
2	East Java	663.183.290.809
3	DKI Jakarta	657.627.185.183
4	Central Java	480.516.498.579
5	Banten	419.473.334.288

Source: Author's own

Discussion

This study tries to determine the potential for collecting zakat through digital in Indonesia in two ways, by mapping and calculating the potential amount of zakat. In the first research objective related to mapping, this research resulted in the division of clusters into 3 parts, namely cluster 1 which consists of 30 provinces (Aceh, North Sumatra, West Sumatra, Riau, Jambi, South Sumatra, Bengkulu, Lampung, Kep. Bangka Belitung, Kep. Riau, DI Yogyakarta, Banten, Bali, West Nusa Tenggara, East Nusa Tenggara, West Kalimantan, Central Kalimantan, South Kalimantan, East Kalimantan, North Kalimantan, North Sulawesi, Central Sulawesi, South Sulawesi, Southeast Sulawesi, Gorontalo, West Sulawesi, Maluku, North Maluku, West Papua and Papua), Cluster 2 which consists of 3 provinces (West Java, Central Java, and East Java) and Cluster 3 which consists of 1 province (DKI Jakarta).

Each cluster has its own characteristics based on the variables that make up the mapping. Cluster 1 which consists of 30 provinces, has a weak category on all variables (Agriculture Zakat, Farm Zakat, Money Zakat, Corporate zakat, Income zakat, Muzakki, National Zakat Index, ICT Index and Number of Bank Accounts). While cluster 2 which consists of 3 provinces consists of 6 variables that are in the high category (Agriculture Zakat, Farm Zakat, Corporate zakat, Income zakat, Muzakki, and Number of Bank Accounts), 1 medium category variable (ICT Index) and 2 low category variables (Money Zakat and National Zakat Index). On the other hand,

cluster 3 which only has 1 province, consists of 5 variables that are in the high category (Money Zakat, Corporate zakat, Income zakat, National Zakat Index, and ICT Index), 2 variables that are in the medium category (Muzakki and Number of Bank Accounts) and 2 variables that fall into the low category (Agriculture Zakat and Farm Zakat).

Based on the cluster division above, it can be seen that the provinces with the highest potential variables for collecting zakat through digital are still concentrated in Java Island. This is proved by the existence of clusters 2 and 3 which consist of 4 provinces on Java Island that has many variables with high category. This is also driven by the results of the second research objective which estimates the potential amount of zakat through digital. The 5 provinces with the highest potential for collecting zakat through digital are West Java, East Java, DKI Jakarta, Central Java and Banten. Interestingly, all of them are located on Java Island.

This is in line with previous research conducted by the Puskas BAZNAS (2020) where a total zakat potential is 233.84 trillion rupiah and Java Island has the most potential of zakat around 151.41 trillion or 64.75 percent of the total potential.

By the total potential for zakat through digital is 5,328 trillion rupiah per month or if it is calculated for a year, it is 63,937 trillion rupiah for the 2019 period. Compared with the report from the National Center for National Zakat on Zakat National Statistics (2019), a nominal amount of 10,23 trillion was obtained as

the amount of zakat collected in that year. Through increased efforts to collect zakat funds digitally with a potential of Rp 36 trillion as per the results from this research, it is expected that potential zakat collection can be significantly improved. Furthermore, it may reduce the gap between the potential and the realization of zakat collection in Indonesia.

CONCLUSION AND RECOMMENDATIONS

Conclusion

In the mapping section of digital zakat collection in Indonesia, it is classified based on the similarity of the characteristics of the variables forming the mapping. Each variable in a cluster has its own advantages and disadvantages. Cluster 1 which consists of 30 provinces has 9 variables, all of which are in the low category. Cluster 2 which consists of 3 provinces has 6 variables in the high category, 1 variable in the medium category and 2 variables in the low category. Cluster 3 which consists of 1 province has 5 variables in the high category, 2 variables in the medium category and 2 variables in the low category.

Meanwhile, in calculating the potential for zakat through digital, the potential amount is 5,32 trillion rupiah per month or 63,84 trillion rupiah during 2019. If sorted by provinces that have the highest potential for collecting zakat through digital, the order is West Java, East Java, DKI Jakarta, Central Java and Banten.

Recommendation

The suggestions that can be given from this research include:

1. In an effort to optimize zakat collection through digital in Indonesia, it is necessary to formulate a strategy by taking into

account the advantages and disadvantages of each province. This can be used as a basis for making programs in each Zakat Management Organization (OPZ) in each province.

2. In order to reduce disparities in the development of technology, information and communication (ICT) that support the digitization process in zakat, the government needs to distribute infrastructure especially for provinces that have medium and low categories on the IP-ICT index.
3. The need to improve the performance and governance of each province's Zakat Management Organization (OPZ), which is reflected through IPZ.
4. Variables forming the mapping of zakat collection through digital in Indonesia can be added to the next research including the literacy variable and the level of transparency of OPZ per province which may affect the results of the mapping.

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