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Typology *jihatul Kaaba* on qibla direction of Mosques in Semarang

Ahmad Izzuddin
Universitas Islam Negeri (UIN) Walisongo Semarang
Jl. Prof. Dr. Hamka Km 02 Ngaliyan Kec. Ngaliyan Kota Semarang
Email: izzuddin@walisongo.ac.id

Abstrak

Indonesia merupakan negara dengan jumlah pemeluk Islam terbesar di Asia Tenggara. Perkembangan ilmu keagamaan dalam menyempurnakan ibadah juga berkontribusi pada terwujudnya integrasi antara ilmu agama dan ilmu pengetahuan yang tertuang dalam konsep *jihatul ka'bah*. Salah satunya dengan dilakukannya perbaikan pengukuran arah kiblat oleh masyarakat Indonesia yang cukup marak terjadi dalam setahun terakhir, khususnya di Semarang, Jawa Tengah. Penelitian ini merupakan jenis penelitian lapangan dengan objek masjid-masjid yang ada di kota Semarang. Teknik analisis data menggunakan teori astronomi yakni trigonometri bola. Hasil penelitian ini menyimpulkan dua hal. Pertama, arah masjid kecamatan di kota Semarang masuk dalam kategori akurat. Berdasarkan hasil pengukuran 15 masjid, hanya 3 masjid yang memiliki deviasi terbesar antara 1 hingga 12 derajat. Kedua, penerapan *jihatul ka'bah* sebagai wujud integrasi agama dan sains dapat dilihat dari upaya masyarakat kota Semarang dalam mengukur arah kiblat dengan bersikap terbuka dalam menerima hasil koreksi pengukuran arah kiblat terkini.

Kata Kunci: Pemberdayaan, jihatul ka'bah, arah kiblat

Abstract

Indonesia is the country with the largest number of Muslims in Southeast Asia. The development of celestial science in perfecting worship also contributed to the implementation of integration between religious science and science contained in the concept of *jihatul Kaaba*. Including improving the measurement of the Qibla direction in Indonesian society which in the last year was quite widespread, especially in Semarang, Central Java. This research is a type of field research with objects of mosques in the city of Semarang. Data analysis techniques using astronomical theory is spherical trigonometry. The results of this study conclude two things. First, the direction of the subdistrict mosque in the city of Semarang is included in the accurate category. Based on the results of measurements of 15 mosques, only 3 mosques have the greatest deviation between 1 to 12 degrees. Second, the implementation of the *jihatul Kaaba* as a form of integration of religion and science can be seen in the efforts of the Semarang city community in measuring the direction of Qibla by being open in accepting the results of corrections to the latest Qibla direction measurement.

Keywords: empowering, jihatul ka'bah, qibla direction

Introduction

The commands to face the qibla becomes a very important thing in terms of the validity of prayer. Since the revelation of the verse that ordered the Messenger of Allah and his people to face the temple (*baytul al-harām*) when prayer, this command has become one of the legal requirements for prayer. In the early days of Islamic development, there was no problem in determining the direction of qibla. The presence of Muslims who are still around the Kaaba and the Grand Mosque makes it easy for them to face the Kaaba. And when they were

outside the city of Mecca and the Prophet was still with his companions, he himself showed the qibla direction. However, when Rasulullah SAW was not with friends and they began to wander outside the city of Mecca to develop Islam, determining the direction of Qibla became difficult and complicated.

The friends began to take advantage of the position of the stars. In Arab lands, the main star that is used as a reference in determining direction is the Qutbi or Polaris star (North star), which is the only star that points right north of the earth.[1] With this star and several other stars, the qibla direction can be determined easily. But for residents outside Arab lands, including in Indonesia, the rules for determining the direction of qibla based on the polar star (Qutbi or Polaris) become more complicated. This is because the star is low on the horizon. Other methods continue to develop along with the development of science.

Then the method of determining the direction of qibla was developed by using *rubu' al-mujayyab*, which is a traditional instrument used to measure the direction of qibla. Then found a direction device that is a compass to show the direction of the wind that can be used also to show the direction of the qibla of a place by using the angles he had. Especially in Indonesia, along with the development of technology and science, the determination of the direction of the qibla is developing,[2] GPS (*Global Positioning System*) and theodolite digital also used to get a more accurate qibla direction, until some software appears that is used to check the qibla direction like *google earth*, *qibla locator*, *qibla direction* which can also be used to check the qibla direction. Likewise in terms of the theory of qibla direction measurement known approaches to the theory of spherical trigonometry and geodetic theory.[3]

From the research side, research related to the direction of qibla is considered to have been many such as the direction of qibla and the shadow of the Gnomon by the Sun,[4] qibla measurement uses software or accuracy of many methods of determining the qibla direction [5]. Then, from the available field data, the direction of the qibla of most mosques in the city of Semarang has not been done by checking the qibla direction. Even regarding the method of measuring the direction of qibla is not much known. Based on information, it is known that the contractors when building a mosque only make a analogy of the count of the large mosque around their mosque. Therefore, the author considers the need for the study of empowering *jihatul kaaba* in applying the direction of the Qibla Mosque of sub-districts of the city of Semarang.

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[1] David A King, *Astronomy in the Service of Islam* (USA: Variorum Reprints, 1993), 254.

[2] Depag RI, *Pedoman Penentuan Arah Kiblat* (Jakarta: Direktorat Jenderal Pembinaan Kelembagaan Agama Islam, 1995), 47-49.

[3]Marwadi, "Aplikasi Teori Geodesi Dalam Perhitungan Arah Kiblat," *Jurnal Manahij* 8, no. 2 (2014).

[4] Moedji Raharto and Dede Jaenal Arifin Surya, "Telaah Penentuan Arah Kiblat Dengan Perhitungan Trigonometri Bola Dan Bayang-Bayang Gnomon Oleh Matahari," *Jurnal Fisikia Himpunan Fisika Indonesia* 11 (2011): 23–29.

[5] Ahmad Izzuddin, *Kajian Terhadap Metode-Metode Penentuan Arah Kiblat Dan Akurasinya* (Jakarta: Kementerian Agama RI, 2012).

Muslim views in determining the Qibla of the Mosque

Muslim community in building a mosque in the city of Semarang, including efforts at *jihatul kaaba*. This can be found from how the pattern of understanding of *takmir* and also efforts to determine the direction of qibla in accordance with the technology that developed in each era. Efforts to determine the direction of the qibla of each mosque are different at each time in accordance with the development of tools at the time, however, all the diverse efforts are a form of Muslim behavior in building the mosque.

Determination of the direction of the qibla of several mosques in Semarang chose to determine the direction of the qibla based on the beliefs of the people who are elder at the mosque. This belief was manifested in the form of measurements using equipment that could be accessed at that time. The subdistrict mosque in Semarang was established around the 1900s, where the equipment that can be used is a compass, a bump and the shadow of the Sun.

Another view that can be considered unique is when *takmir* determine the direction of the qibla in Semarang, one of which uses beliefs to refer to prayers for guidance. The prayer of seeking guidance (*istikhārah*) is a way through two *rakats* to get directions according to the beliefs of those who carry out these prayers. The direction of qibla is known after performing the *istikhārah* prayer several times so that the elder or so-called elder of the founder of the mosque determines the qibla using this method. However, this ijtihad is in accordance with their beliefs without using any instrument, there is only one belief that the qibla is appropriate facing the Kaaba.

The method of determining the direction of qibla in addition is to use the method of *istiwa'ain* and *rashdul al-qibla*[6]. This method is included in the method which is quite accurate compared to the compass, meaning that there is already a good public understanding of astronomy. This method is carried out by the founder of the mosque's elders. *Rashdul al-qibla* method is quite familiar and well known by the public. This shows the efforts made by the community to determine the qibla so that it faces the Kaaba in *Baitullah*, Masjidi Haram, Mecca, Saudi Arabia.

Of the 15 mosques that were the objects of research, it was concluded that the first mosque measurements usually used compass, aids, and qibla shadows. In the 70s, the calculation of the qibla direction only used the approximate formula or estimated instincts by the figures around the mosque. On average mosques that have been measured are mosques that have been held to check the Qibla direction two or three times. Even during the renovation of the mosque's expansion, adjustments were made by measuring the qibla direction.

Over time, public understanding of the importance of facing the direction of qibla has been seen from the efforts of *takmir* in coordination with the authorities, for example in this case the Ministry of Religion or related institutions such as universities that provide knowledge to *takmir* to be able to measure the

[6] This method can be done every day. Read more at Sakirman, "Formulasi Baru Arah Kiblat : Memahami Konsep Rasydul Kiblat Harian Indonesia," *Jurnal Al-Qisthu* 16, no. 1 (2018): 1–8.

direction of qibla properly and appropriately. Measurements are carried out in consultation with competent authorities even if the measurements are first made with only modest equipment.

Geographically, Semarang is located on the north coast of Java, with a position between the longitude 110o 23 '79 "East and 110 o 27" 70 "West and latitude 6o 55" 6 "LS and 6o 58" 18 "LS. The beauty and geographical uniqueness of having hilly areas (upper cities) and valleys or plains (lower cities) directly adjacent to the coast makes it often referred to as "Venice of the East". In contrast to other cities or regions that always begin their history with a "*babad alas*" by its founding figures, Semarang as a coastal city is a city that emerges from mud deposits that slowly form alluvial land that pushes the coastline to the sea. Of the fifteen mosques, two typologies can be made based on Thomas Djamaluddin's two-degree tolerance, i.e:

The tolerated typology of *Jihatul Kaaba*

First, the sub-district mosque in Ngaliyan has a slope of 1° 43 "6.09" less to the South. Based on information from the mosque *takmir* named Qamaruddin that in 1917 Darus Syukur Mosque was established by Darus and Abu Syukur. At first the mosque was still in the form of a mosque until then renovated in 1981. Added a large door in front of the mosque. Determination of the direction of the mosque's qibla using the sun shades and shadows and *istikhārah* conducted by the elders of the founder of the mosque. But more clearly about this information is not found. In conclusion, this mosque has been measured in the direction of qibla before.

From the time it was founded until now, the Darus Syukur Mosque has only been tested for qibla direction, which was conducted in 2014 by a measuring team from the 2011 Falak Science students of UIN Walisongo. After being measured, it is known that the direction of the mosque is inclined. Because of the openness of the *takmir*, the qibla direction was then revised by changing the prayer, prayer mats in the mosque were adjusted.

The Ngaliyan district office of religious affairs pointed to the district Mosque in Ngaliyan as the Darus Syukur Mosque on the Ngaliyan highway in front of the Ngaliyan district office. Dotted coordinate latitude of -6O 59 '47.35 "latitude and longitude 110O 20" 48.4 "east longitude. With a strategic place, this mosque is always crowded to perform prayers or connect with other worship. Regarding the direction of the mosque's qibla, the determination of the direction of the mosque's qibla uses the sun shades and shadows as well as *istikhārah* conducted by the elders of the founder of the mosque. But more clearly about this information is not found. The 2011 Falak Science Force from UIN Walisongo rechecked the qibla direction. After that the *takmir* has revised and changed the prayer line (*shāf*) according to these measurements.

The measurement of qibla direction at Darus Syukur Mosque, Ngaliyan sub-district was conducted on Wednesday, July 1, 2015 which coincided at 11:28 AM. By using GPS aids, the author can find out the latitude of a place of -6O 59 '47.35 "latitude and longitude of a place for 110O 20" 48.4 "East. To find out the declination of the Sun and Equation of Time through the Winhisab program which

is 23O 7 '33.33 "and -0O3" 45 ". After doing reckoning the qibla direction from the data, it can be seen that the Sun's time angle is -3O 35 '26.6 ", the sun's azimuth is 6O 32' 59.75", its true north is 353o 27 '0.25 ", its qibla azimuth is 294o 31' 13" , 66 ", and different azimuth for 287o 58 '13.91". From these data, the writer measured the direction of the mosque of Darus Syukur, Ngaliyan district. After knowing the qibla direction, the results of the study showed a slope of 1o 43 "6.09" less to the South. Qomaruddin witnessed the measurement.

Second, the al-Hidayah Mosque which has a slope less than 1o to the North. The construction of this mosque started from building a *mushalla* which was continued to be a mosque. Since the establishment of the mosque, the direction of the qibla has not been checked. Determination of the direction of the mosque's qibla was initially carried out by elders who donated the land for the mosque through the *istikhārah* prayer. So, the author does not get much information about the history of the initial determination of the direction of the mosque's qibla.

At first the office of religious affairs appointed al Ijabah Mosque as a sub-district mosque. However, due to the complicated conflict about changing the direction of the qibla that had previously occurred at the mosque, the office of religious affairs was worried that we would experience the same thing. The changes in the direction of the qibla that have been measured previously at Al Ijabah Mosque are truly felt as a very sensitive issue among the *takmir* management of the mosque, both new and old management. So, in the end, the office of religious affairs directed us to measure the qibla direction to the Al Hidayah Mosque. Al-Hidayah Mosque coordinates -7o 01 '13.65 "South Latitude and 110o 23" 2.82 "East Longitude. Determination of the direction of the mosque's qibla was initially carried out by elders who donated the land for the mosque with *istikhārah*.

On June 28, 2015, a qibla direction study was conducted at the Al-Hidayah Mosque in Gunung Pati district at 12:15 PM. As with other studies, the location of latitude and longitude is obtained via GPS. The value of the latitude obtained is -7o 01 '13.65 "LS. While the longitude is 110o 23 '2.82 "East. Through the Winhisab program or the 2015 Ephimeris book of the ministry of religion, the Sun Declination is 23o 17 '18.25 "and Equation of Time is -0o 3" 9.25 ". After knowing the data, Dabat shoots the Sun using theodolite first. With the formulas and available data, we can know the time angle of the Sun (8o 20 '44.07 "), the azimuth of the Sun (345o 10' 7.13"), true north (14o 49 '52.87 "), Qibla azimuth (294o 31 '3,57 "), Different from azimuth (309o 20' 56.45"). From the results of research and targeting the direction of the qibla Al-Hidayah Mosque in Gunung Pati sub-district, there is less than 1o to the north of the slope witnessed by Sarman, Sukamto in measuring the direction of qibla.

Third, the Merapi Baiturrohim Gajah Mungkur Mosque which is located at 60 55 ’34.45" South Latitude and 1100 23 "54.03" has a slope of 00 21 "23". The early history of determining the direction of the qibla direction of the Merapi Baiturrohim Gajah Mungkur Mosque was first measured by the Muhammadiyah and Masyumi student association from Yogyakarta. Determining the direction of the mosque's qibla initially only used a compass which at the time (1955) used a compass tool. If we look at history, the compass tool at that time was a

sophisticated mosque measuring instrument when compared to other measuring instruments such as the meter and other classical measuring devices. The first proposal for the qibla direction of Merapi jami Masjid Baiturrohim Gajah Mungkur is to rely only on the west leaning slightly north. However, armed with the relations of the surrounding community with some academics from Yogyakarta, the mosque initiators were able to seek measurements using a compass.

Re-checking and justification for the direction of the Merapi jami Masjid Baiturrohim Gajah Mungkur was carried out in the early 21st century by an authorized institution in the Ungaran area of Semarang Regency. From the results of these measurements, obtained the same results with the results of measurements made using a compass. Baiturrohim Merapi Jami Mosque is a mosque that stands in the Mungkur elephant district of Semarang City.

This mosque stands in an area with heterogeneous population where not only Muslims live in the area, but many other religious communities who live in the area around the mosque. This is proven by the existence of a Dutch tomb (as the local people call it) where the meal is the final resting place of Christians. However, with the spirit of diversity of the surrounding community which is quite high, the mosque can stand firmly without any horizontal conflict between fellow religious communities in the area.

Astronomically, the Merapi Baiturrohim Gajah Mungkur Mosque is located at 6o 55 "34.45" South Latitude and 110o 23 "54.03". The history of determining the direction of the Merapi Baiturrohim Gajah Mungkur Mosque, based on interviews that have been carried out, the direction of the Merapi Baiturrohim Gajah Mungkur Mosque was first measured by Muhammadiyah and Masyumi student associations from Yogyakarta. Determining the direction of the mosque's qibla initially only used a compass which at the time (1955) used a compass tool.

Qibla direction checks are carried out on Saturday 30 June 2015 at 11.24 AM. From the results of checks that have been made, the results obtained measuring the direction of qibla deviated by 0^0 21 '23 "where the results are still quite relevant to the results of current measurements. The direction of the qibla before being measured is 294^0 12 '11 "and after measurement we get 294^0 33' 34". In accordance with the direction of the head of the qibla direction checking team, we only conveyed the results of the qibla direction measurement without having to change from the qibla direction of the mosque that had been determined from the beginning. We submit all measurements to the mosque *takmir* whether our measurement results will be used or not. Witnessed directly by *takmir* of this Mosque.

Fourth, Mijen subdistrict mosque which has 0^o 38 'less to the South. According to the mosque takmir, the initial measurement of the direction of qibla, which is around the 70s, only uses the approximate formula or uses only instincts by the figures around the mosque. Because people in ancient times did not know of modern tools like today. When the mosque turned into a mosque the measurement of the direction of qibla had never been measured again, maybe only one year ago, there was a UIN Walisongo student who had rechecked the direction

of the qibla at the Al Muttaqin Mijen Mosque using a compass and an Android cell phone with an application set to determine the direction. Qibla, and finally the result of the qibla direction in the mosque did not change. The explanation was obtained from the Al-Muttaqin Mosque *takmir* named Taslim which is the third generation in the mosque.

Baitul Muttaqin Mijen Mosque is located east of the Mijen market on Jl. Salya No.2, Mijen District, Semarang City. Al-Muttaqin Mosque was founded in 1999 on government land, which coordinates-7O 3 5.5 "South Latitude 110O 23" 15.2 "East Longitude. The initial measurement of qibla direction is around the 70s using only approximate formulas or estimates using instincts only by the figures around the mosque. Because people in ancient times did not know of modern tools like today.

On Tuesday, June 23, 2015, a Qibla direction was conducted at the Baitul Muttaqin Mosque in Mijen district at 14:23 PM. As other studies obtain latitude and longitude data via GPS. The value of the latitude obtained is 7o 3 '5.5 "LS. While the longitude is 110o 23 '15.2 "East. Through the Winhisab program or the 2015 Ephimeris book of the Ministry of Religion, the sun declination is 23o 25 "32.23" and Equation of Time is -0o 2 "7". After knowing the data, Dabat shoots the Sun using theodolite first. With the formulas and existing data, we can know the time angle of the Sun (40o 36 '30.2 "), the Sun's azimuth (308o 47' 34.03"), true north (51o 12 '25.97 "), qibla azimuth (294o 31 '28.38 "), different azimuth (345o 43' 54.35"). From the results of research and targeting of the qibla direction of the mosque there are 0o 38 'less to the south of the slope witnessed by Taslim in measuring the direction of the Qibla.

Fifth, the subdistrict mosque in Tugu is the Al-Iman Mosque which has the direction of qibla as it should be measured. The Al-Iman Mosque at the beginning of the construction invited the Asikin chaplain, the caretaker of the Rodlotut Tholibin Tugurejo Islamic Boarding School to measure the direction of the qibla, and he measured it using his compass. The Ministry of Religion, and using the theodolith, turned out to be only a small difference from measurements made by Asikin clerics who used a compass, then measured by IAIN students under the guidance of Syifaul Anam, so it can be concluded that the qibla Mosque measurement was measured three times.

The sub-district Mosque in Tugu is called Al-Imam Mosque which coordinates 06o 59 "8.8" LS and 110o 20 "36.7 east longitude. Actually, the Al-Iman Mosque at the beginning of the construction invited the Kyai Asikin, the caretaker of the Rodlotut Tholibin Tugurejo Islamic Boarding School to measure the direction of the qibla, and he measured it using his compass. This was the first person to measure the qibla of the Al-Iman Mosque.

Friday 3 June 2015 With the patience witness at 14: 46 WIB, data were obtained, namely Latitude Place 6o 59 '8.8 "LS and 110o 20' 36.7" East, Sun Declination 22o 58 '18.80 ", Equation of Time -0o 04 '09.77". After knowing these data can be seen some reckoning Qibla direction. Sun Time Angle of 45o 48 '10.20 ", Azimuth of the Sun (305o 11' 19.06"), True North (54 ° 48 '40.94 "), Azimut Qibla (294o 31' 06.54"), Different Azimut (349o 19 '47.48 "). From the data and the results

of calculations can be seen the direction to qibla. After aiming the qibla direction, the qibla direction at the Mosque is in accordance with what we measured.

Sixth, the subdistrict mosque in Banyumanik which has a qibla accuracy that matches the measurement results of the Uin Walisongo measuring team. The subdistrict mosque in Banyumanik is called the Jami Mosque 'Nurul Huda. Now the size of the mosque is 20 x 14 m. Gedawang village community is a religious community, it can be known from various religious activities carried out in the area such as religious studies, evening activities carried out by children, and so forth.

The mosque is coordinated 7° 5 '18.4 "South Latitude and 110° 25' 35.9" East. For the qibla direction, at that time it only relied on the *Rashdul Qibla* which was conducted twice in April and June. The measurement of the direction of qibla was the first time at this mosque, at that time only based on the *Rashdul Qibla* which was done twice in April and June.

The measurement of qibla direction at the Jami Mosque 'Nurul Huda Banyumanik sub-district was conducted on Thursday, July 3, 2015 which coincided at 10.30 AM By using GPS aids, the author can find out the latitude of a place of 7° 5 '18.4 "LS and 110° 25" 35.9 "East. To find out the declination of the Sun and Equation of Time through the Winhisab program which is 22° 59 '09.00 "and - 0° 4" 07.50 ". After doing reckoning the qibla direction from the data, it can be seen that the Sun's time angle is -18° 06 '16.60 ", the sun's azimuth is 30° 00' 01.18", the true north is 329o 59 '58.82 ", the qibla azimuth is 294° 31' 27 , 90 ", and different azimuth for 264° 31 '26.72". From these data, the writer measured the direction of the mosque's qibla. After knowing the direction of the qibla, that the results of the study showed similarities between the direction of the qibla with the direction of the mosque.

Seventh, the subdistrict mosque in Candisari which has a slope of 0o 38 '11.74 "less to the North. The measurement of the qibla of Al Amanah Mosque is only done at the beginning of the construction of the mosque by using the classic *istiwa* stick tool or often known as Bencet. So far, the Al Amanah Mosque has never taken measurements of the qibla direction again. Based on research on Saturday, June 27, 2015 at 10.18 AM West Indonesia Time, the al-Amanah Mosque in Candisari sub-district obtained data, namely 7o 00 '19.7 "LS and 110o 25' 52.8" East, Sun Declination 22o 09 '7 ", Equation of Time -0o 5' 26". After knowing these data can be seen some reckoning qibla direction. The Sun's Time Angle of 21o 25 '37.2 ", Azimuth of the Sun (35o 12' 48.46"), True North 324o 47 '11.54 ", Azimut Qibla 294o 30" 10.42 ". From the data and the results of calculations can be seen the direction to Qibla. After aiming at the qibla direction, there is a deviation of qibla direction of 0o 38 '11.74 "less to the North with witnesses Sugiono, Idam Kholis, and Ahmad Arismanto.

Eight, the subdistrict mosque in west Semarang which has a slope of 0o 42 '36.87 "Less to the South. In 1990 until now the chairman of the mosque foundation was held by Imam Sudjono. Only yesterday leadership was delegated to his son Solehan Harun and the secretary was his younger brother Wisnu Hermawan. The current chairman of *takmir* is led by Supar'in. This mosque was once measured

using a Bencet tool and compass, then for renovations thereafter, the accuracy of the Qibla direction is only checked with a compass.

Saturday 11 July 2015 With witnesses Sufar'in, Solehan Harun, Wisnu Hermawan, at 08:57 AM, data were obtained, namely 6° 58 '47.7 "LS and 110° 23' 32.9" BT, Sun Declination 22° 09 '33.95 ", Equation of Time -0° 5' 25". After knowing these data can be seen some reckoning Qibla direction. Sun Time Angle of 41° 42 '42.1 ", Azimuth Sun 53° 21" 18.75 ", True North 306° 38" 41.25 ", Azimut Qibla 294° 30" 20.34 ". From the data and the results of calculations can be seen the direction to Qibla. After aiming the Qibla direction, there is a slope of 0° 42 ’36.87" Less to the South.

Nine, the subdistrict mosque in Genuk which has a slope of 0° 15 '44 "less to the north. History of the measurement of the qibla Mosque Nurul Huda Muhamad Shobirin did not know exactly what method was used because before he was born this mosque was already available, "if the qibla issue I do not know mas, because long before I was born this *musholla* already existed" he concluded. Likewise, according to Muhammad Ismun Widodo, who in fact is younger than sobirin, he also did not know the method of determining the direction of the qibla used when the mosque was first built, as for the first and second restoration years for the qibla with the initial building of the mosque. He added that this mosque had never been re-measured in its direction.

The beginning of determining the direction of qibla at the Jami At-Taubah Pedurungan Mosque was carried out by the Ministry of Public Works which was especially carried out by Mulyono in 1995 using the Theodolite. From the beginning of development up to now there have been two qibla measurements, namely at the beginning of construction and when the *Rashdhul* Qibla occurred in May and July in 2009. The second way of determining the qibla is done by looking at shadows that fall during the *Rashdhul* Qibla and after that the thread is pulled according to the shading according to the global *Rashdhul* Qibla hours. Checking in 2009 was carried out by the teenager of the mosque. The result is that there is a slight lack of interest in the West. After knowing this the mosque manager, *takmir* and residents still use the previous qibla direction. Because according to them what is important is the *jihadul Kaaba*. Because *‘ainul Kaaba* cannot be done. Although Ulin Nuha already knew that a 1-degree inclination would experience a difference of hundreds of kilometers from the direction of the Kaaba.[7]

Shobirin added that this mosque has never been re-measured the direction of the qibla so it was the right moment when we came there to cross-check the qibla direction again, that afternoon after the *Asr* prayer congregation we immediately took aim at the Sun to find the qibla azimuth data, precisely at 03.30 PM after we have obtained data, including 6° 59’ 9’’ LS and 110° 29’ 54,5’’, Sun declination 23° 24’ 36,73’, time angle of the Sun 59° 24’ 45,00’’, the Azimut Sun 299° 43’ 48,95’’, true North 60° 16’ 11,05’’, qibla azimuth 294° 28’ 56.27’’ from the count using Theodolite, GPS (Global Positioning System), and the ephemeris data of the Nurul Huda

[7]Interview with Ulin Nuha, address Sendang Utara Street 3 No.31 Pedurungan, Semarang Utara

Mosque qibla is in the 65° 31' 03,73" and interestingly this mosque is just 0° 15' 44" less to the north in any context qibla including very good, considering that in ancient times there has been no accurate qibla method or gauge

Ten, the subdistrict mosque in Pedurungan which has a slope of less than 1o to the north. The measurement of qibla direction at the Jami 'At-Taubah Mosque in Pedurungan sub-district was carried out on Sunday, 28 June 2015 which coincided at 1.30 PM. By using GPS aids, the author can find out the location of the mosque which is 7° 00 '35.3 "LS and 110° 27" 40.9 "East. To find out the declination of the Sun and Equation of Time through the Winhisab program which is 23° 17 '10 "and -0o 3" 10 ". After doing reckoning the qibla direction from the data, it can be seen that the Sun's time angle is 27° 10 '10.9 ", the sun azimuth 319° 33' 28.3", the true north is 40° 26 '31.65 ", the qibla azimuth is 294° 29' 49" , and different azimuth for 334° 56 '20.7 ". From these data, the writer measured the direction of the mosque's qibla. After knowing the direction of the Qibla, that the results of the study showed a slight inclination to the north which was witnessed by M. Ulin Nuha.

Typology of *Jihatul Kaaba* that is not tolerated

There are five typologies of *Jihatul Kaaba* that are not tolerated, namely, first, the sub-district mosque in South Semarang, which has a large incline. Astronomically, the An-Nur Mosque in South Semarang is located at 7⁰ 17.6 'LS and 110⁰ 26' 35.8 "East. According to the information of the mosque *takmir* management, the determination of the direction of the An-Nur Mosque in South Semarang was carried out by the religious scholars at that time by using ijtihad in accordance with their beliefs. Based on the results of the interview, the current chairman of *takmir*, Fanazi, did not get information about the devices used in measuring the qibla at the time. According to him, at that time, the scholars were only guided by the belief that the Qibla direction was appropriate facing the Kaaba.

Only in recent years, with the help of Solahuddin from Ungaran, the direction of the An-Nur Mosque in South Semarang can be seen from the Google Earth software and found a slight slope from the mosque building. The interesting thing from the Chairperson of *takmir*'s explanation is that the mosque construction has followed the qibla direction, not the opposite direction of the qibla that follows the Mosque building. Based on the results of input from Solahuddin, the Imam of the Mosque at that time, Fanazi, made improvements to the mosque's shof which was slightly tilted according to the Kaaba. Initially there was an upheaval between the imam of the mosque and the *takmir*, but thanks to the maturity and breadth of their respective ways of thinking, the qibla direction problem could be resolved without further upheaval.

An-Nur Mosque in South Semarang is a District Mosque that is widely used by worshipers, especially travelers and workers for congregation. This is because the An-Nur Mosque in South Semarang is located on the side of the road so that access to this place of worship is quite easy without having to enter the village road. In addition, on both sides of the mosque there are also many shops

so that many employees who perform *dhuhur* and *asr* prayer at this mosque. Astronomically, the AN-Nur South Semarang Mosque is located at -7^0 17.6 'LS and 110^0 26' 35.8 "East. The determination of the direction of the direction of the An-Nur Mosque in South Semarang was carried out by the religious scholars at that time by using ijtihad in accordance with their beliefs.

Reviewing the direction of the qibla Masjid An-Nur, South Semarang sub-district. We do the qibla direction check on Saturday 4 July 2015 at 14.55 PM. From the results of the check that we have done, we obtain the measurement results of the qibla direction which is off by 5o 42 '38.14 "less towards the North. As for the qibla direction, we obtained the results of 294^0 29 '59.84 ". Declination of the Sun at 22^o 53 '19.33 ", equation of Time -0^o 4" 19.6 ", True North 56^o 5" 19.57 ", Different Azimut 350^o 35" 19.41 ". In accordance with the direction of the head of the qibla direction checking team, we only conveyed the results of the Qibla direction measurement without having to change from the qibla direction of the mosque that had been determined from the beginning. We submit all measurements to the mosque *takmir* whether our measurement results will be used or not. And witnessed directly by Fanazi as chairman of *takmir*.

Second, the subdistrict mosque in Tembalang Facing the qibla is one of the legal requirements for prayer, but often the direction of the qibla is related to the beliefs and psychological conditions of each. So, often the Mosques that turned out when checking the qibla direction were slightly tilted, *takmir* Masjid along with the *jama'ah* did not correct it, meaning they continued to use the qibla direction originally for various reasons. Some have become accustomed to such qibla direction so that when they are changed, they feel unsure. There is a lack of trust in the astronomers because in the past measuring the direction of the qibla was a trustee.

Likewise, the story of determining the direction of the Al-Makmur Mosque. Since the direction of the qibla was first measured when the ground of the mosque was ready to be built until the first of July 2015, it had never been rechecked. This is because the surrounding community is completely convinced of the direction of the qibla determined by Abdul Manan who is one of the trustees in Tembalang sub-district.

Al-Makmur Mosque is the oldest mosque in Tembalang district. This mosque was established when the land of the Waiting village was not yet fertile, it was overgrown with houses and shophouses. In fact, this mosque was established when neighboring villages did not yet have a mosque. So that this mosque becomes an intermediary for interaction between residents. This mosque coordinates the story of determining the direction of the Al-Makmur Mosque. coordinates -7 ° 3 '18.4' 'LS and 110 ° 28' '16.5' 'BT determine the direction of the Qibla at this mosque using knowledge from approximately local community leaders.

The measurement of qibla direction at Masjid Al-Makmur Tembalang sub-district was conducted on Wednesday, July 2, 2015 which coincided at 10:25 AM. By using GPS aids, the author can find out the latitude of a place of -7^O 3 '18.4 "latitude and longitude of the place for 110^O 28" 16.5 "East. To find out the

declination of the Sun and Equation of Time through the Winhisab program which is 23O 3 '38.36 "and -0O 3" 55.45 ". After doing reckoning the qibla direction from the data, it can be seen that the Sun's time angle is -19O 15 '35.25 ", the sun's azimuth is 31O 29' 28.99", the true north is 328O 30 '31.01 ", the Qibla azimuth is 294O 30' 20 , 89 ", and different azimuth for 263O 00' 51,9". From these data, the writer measured the direction of the al-Makmur Mosque of Ngaliyan sub-district. After knowing the direction of the qibla, that the results of the study showed a slope of 6o 53" 0.52" less to the North. Muslih Suhaimi, Musofiah, Haris Imam Muttaqin were witnesses of the measurement.

Third, the subdistrict mosque in Gayamsari which has a slope of 8o 15 '9.1 "less to the south. This mosque land belongs to the Private Boarding House of Brimop, more precisely it belongs to a member of the Mobile Brigade named Yoso and does not belong to the National Police Headquarters, but in reality, the mosque is used in general. For the measurement of the direction of the mosque's qibla, it has been measured only once by Bintal, Kauman Mosque members and other experts, there are 4 people. The measurement of the qibla direction of the Al-Ikhsan Mosque at that time used the *istiwa'ain* and *rashdul qibla* methods.

Al-Ikhsan Mosque is located in the police dormitory, Kabluk, Gayamsari, Semarang, right next to the Bhayangkara Hospital Semarang, which coordinates 7 ° 00' 00.1" LS and 110 ° 26" 44.9 "East. For the measurement of the direction of the mosque's qibla, it has been measured only once by Bintal, Kauman Mosque members and other experts, there are 4 people. The measurement of the qibla direction of the Al-Ikhsan Mosque at that time used the *istiwa'ain* and *rashdul qibla* methods.

Based on the research that we did on Saturday, June 27, 2015 at 10:16 AM, at the al-Ikhsan Mosque, Gayamsari sub-district, data were obtained, namely 7o 00 '00.1 "LS and 110 ° 26'44.9" BT , Declination of the Sun 23o 19 '58.4 ", Equation of Time - 0o 2' 56". After knowing these data can be seen some reckoning Qibla direction. Sun Time Angle of 21o 17 '15.1 ", Azimuth of the Sun (33o 49' 50.35"), True North (326o 10 '9.65 "), Azimut Qibla (294o 29' 53.39"), Azimut difference (260o 40 '3.04 "). From the data and the results of calculations can be seen the direction to qibla. After aiming the qibla direction, that there is a deviation of qibla direction of 8o 15 '9.1 "less to the South.

Fourth, the subdistrict mosque in East Semarang which has a slope of 7o far south. Beginning of the first measurement that is using a compass, which can be known accuracy is less precise. The first measurement is also limited to knowing the west and east, and the qibla itself is still following the road. Kyai Saliyun took the first measurement by asking for help from his friend from Kauman. The mosque in general has its own history and uniqueness, one of which is the Al-Hidayah Mosque in Central Java (precisely on Musi 2A street, Bugangan Sub-district, East Semarang District at present). This mosque is located at 6o 59 '63 "South Latitude and 110o 26' 11" East, measurement time at 14:24 PM, Sun Declination 23o 07 '04.00 ", Sun time angle 40o 29' 35" and true north 51o 31 '01.22 ". So, from these data, it is known that the Azimuth Qibla is 294o 29 '46 ", which then slopes about 7o further south from the qibla direction it should be. The

measurement carried out was witnessed directly by the new *takmir* Masjid, Taufiqur Rahman.

Fifth, the subdistrict mosque in North Semarang which has a slope of 11° Less to the South and the mosque area for Princess 25° Less to the North. At the beginning of the construction of the Menara Mosque in North Semarang Layur the determination of the direction of qibla was determined at the time of construction, namely by the Arab merchant. And the direction of the qibla from 200 years ago until now has not been rechecked. Initially there was only the main mosque. But around 2013, a *musholla* was made for women. With the reason that he wanted to maintain his holiness, if the woman was menstruating, when passing by it was feared that her blood dripped in the mosque. So, to anticipate this a *musholla* was made for women. In determining the direction of the qibla it only follows the direction of the previous mosque building which is only perpendicular. At the main mosque the direction is facing west oblique to the north. As for the women's *musholla*, only facing west.

The results of the interview on June 1, 2015 Ali Mahsun confirmed that the women's *musholla* was indeed not in the direction of the main mosque, whereas if the direction was like the main mosque it would cause a narrowing of the place to pray. The measurement of qibla direction at the Layur Tower of Semarang Layur sub-district was conducted on Wednesday, July 1, 2015 at 12:59 PM. Using GPS aids, it is known that the mosque is located at 6o 57 '58.8 "latitude and 110° 25" 19.9 "east longitude. To find out the declination of the Sun and Equation of Time through the Winhisab program which is 23° 7 '18.17 "and -0° 3" 45.98 ". After doing reckoning the Qibla direction from the data, it can be seen that the Sun's time angle is 19° 13 '50.2 ", the sun's azimuth is 328° 32' 27.8", its true north is 31° 27 '32.2 ", its qibla azimuth is 294° 29' 43, 22 ", and different azimuth for 325° 57 '15.42". From these data, the writer measured the direction of the mosque's qibla. After knowing the direction of the Qibla, that the results of the study showed the inclination of Putra 11° Mosque Less to the South, Putri 25° less to the North, Ali Mahsun as the witness.

From the two typologies above, it was concluded that there was a good response to the results of the qibla direction measurement from Walisongo State Islamic University Semarang. This is evidenced by the acceptance of the measurement results that have been made by the measuring team. The community accepts the results of the measurement, even the re-measurement is the third time after taking measurements using a compass or using the Sun's shadow method or *rashdul qibla*. The *rashdul qibla* method used by the community is observation of perpendicular objects by paying attention to the annual *rashdul qibla* time in May and July.[8] The openness of *takmir* parties to be able to accept the results of the qibla direction measurement indicates a good response to the verification of existing measurements. As a mosque in public spaces with openness to receive checks[9],

[8] Moedji Raharto, "Telaah Indikator Arah Kiblat Melalui Bayang-Bayang Oleh Matahari Pada Saat Di Dekat Zenith Ka'bah" (Yogyakarta, 2007), 4.

[9] Anisah Budiwati and Saiful Aziz, "Akurasi Arah Kiblat Masjid Di Ruang Publik," *Jurnal Sains Sosial Dan Humaniora* 2, no. 1 (2018), 172-173.

mosques in the city of Semarang also responded well in receiving measurement results. Even if we compare it with other places, the direction of the mosque's qibla affects the hierarchy of the movements in the mosque.[10]

Conclusion

This research describes the typology of *jihatul Kaaba* that was implemented by the people of Semarang in perfecting one of the pillars of prayer that is facing the qibla direction. This implementation arises from religious orders to be able to face the direction of qibla through several efforts, namely spiritual efforts in determining the direction of Qibla through *istikhārah* way, traditional ways, and modern ways to be able to know and straighten the qibla. This study concludes two things, first, there are two typologies of the meaning of *jihatul Kaaba*, those that are tolerated with those that are not tolerated. Based on the results of measurements of 15 mosques, five mosques have the greatest deviation between 2 to 12 degrees while ten other mosques are included in the typology of *jihatul Kaaba* that are tolerated (1-2 degrees). Second, there is the implementation of *jihatul Kaaba* in the efforts of the Semarang city community in measuring the direction of qibla, which is on the openness to receive the results of the correction of the latest qibla direction measurement.

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