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Research Article

History Development Instruments Measuring The Qibla In Indonesia

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Abstract. The execution of the prayer, a fundamental duty for Muslims, encompasses a range of prerequisites, pillars, recommended practices, manners, and restrictions that should be adhered to during the act of worship. A crucial condition for a prayer to be deemed valid involves aligning oneself with the Qibla (the Ka'bah in Masjidil Haram) in the city of Mecca, a consensus reached by scholars. Consequently, there exists a necessity for tools that simplify the determination of the Qibla's direction. Over time, instruments for gauging the Qibla's orientation have evolved significantly, progressing from basic reference objects to user-friendly systems, ultimately leading to a reduction in the time required for measurement. This article will delve into the history of Qibla direction measurements in Indonesia using various methods, ranging from classical to modern approaches. The research employs a qualitative method with a literature review technique, aiming to reveal the historical development of Qibla direction measurements in Indonesia. The obligation to face the Qibla, with technological advancements, necessitates that regulations regarding the Qibla direction follow better guidelines to

enhance the strength of worship implementation. Despite science providing information, religious authorities remain the ones to establish its laws.

Keywords: History, Indonesian Qibla, Measuring Qibla

INTRODUCTION

Facing the qibla is one of the valid conditions for performing prayers. In the Quran, Allah SWT explains this in Surah Al-Baqarah, verse 144:

قَدْ نَرٰى تَقَلُّبَ وَجْهِكَ فِى السَّمَآءِ ۚ فَلَنُوَلِّيَنَّكَ قِبْلَةً تَرْضٰىهَا ۠ فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ ۗ وَحَيْثُ مَا كُنْتُمْ فَوَلُّوْا وُجُوْهَكُمْ شَطْرَهٗ ۗ وَاِنَّ الَّذِيْنَ اُوْتُوا الْكِتٰبَ لَيَعْلَمُوْنَ اَنَّهُ الْحَقُّ مِنْ رَّبِّهِمْ ۗ وَمَا اللّٰهُ بِغَافِلٍ عَمَّا يَعْمَلُوْنَ

" We have observed that you, Muhammad, often gaze towards the sky, and as a consequence, we will change the direction of your gaze according to the qibla that you prefer. Therefore, turn your face towards the direction of the Masjid al-Haram. Wherever you may be, orient your face in that direction. Those who possess the Book (the Torah and the Gospel) are aware that this change of qibla is a truth from their Lord. Allah does not disregard their actions (Quran, Al-Baqarah 2:144).

The word "Qiblah" is derived from "muqābalah," which is also synonymous with "wijhah," originating from the word "muwājahah." Literally, Qiblah refers to the condition of the facing direction. In a more specific context, this term refers to a direction faced by all individuals performing prayer. For Muslims who can directly see the qibla, it is certainly straightforward, but what about those who are far from the qibla direction, even thousands or millions of kilometers. This issue has triggered a discipline of knowledge in Islam, where the Quran, as a source of knowledge, serves as the foundation for various branches of knowledge ranging from engineering, logic, to astronomy. The progress of Islamic civilization can be identified through the advancement of astronomical sciences. Despite its early focus on worship-related aspects such as determining the qibla direction, prayer times, establishing the beginning of the lunar month, and celestial phenomena like eclipses, astronomy has evolved into a diverse field encompassing various scientific disciplines (Munfaridah et al., n.d.).

Sufyan informed us about the statement of Az-Zuhri, who received information from Atha' bin Yazid Al Laitsi, who narrated from Abu Ayyub Al Anshari, who directly heard it from the Prophet. The Prophet forbade facing the qibla while relieving oneself, whether for urination or defecation; instead, it is recommended to face either the east or the west during such acts. Abu Ayyub further recounted: when we were in the region of Syria, we found restroom facilities that had been built facing

the qibla. Therefore, we attempted to slightly angle ourselves when relieving ourselves, while seeking forgiveness from Allah. This hadith illustrates that although it is recommended to face the qibla in performing good deeds, when it comes to relieving oneself, it is advised not to face the qibla (Hadith narrated in Musnad Shafi'i).

Facing the qibla is a necessary means in performing prayers because the obligation to pray makes all elements that serve as intermediaries in carrying out the prayer also become duties that must be fulfilled (Sriani & Ukhti, 2022).

وَمِنْ حَيْثُ خَرَجْتَ فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ ۖ وَحَيْثُ مَا كُنْتُمْ فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ لِئَلَّا يَكُونَ لِلنَّاسِ عَلَيْكُمْ حُجَّةٌ إِلَّا الَّذِينَ ظَلَمُوا مِنْهُمْ فَلَا تَخْشَوْهُمْ وَاخْشَوْنِي وَلِأُتِمَّ نِعْمَتِي عَلَيْكُمْ وَلَعَلَّكُمْ تَهْتَدُونَ

"And whenever you, Muhammad, set out, direct your face toward the Sacred Mosque. Wherever you may be, orient your face in that direction, so that people will have no argument against you, except for those who do wrong among them. Do not fear them, but fear Me. By doing so, I will complete My favor upon you and guide you on the right path (Quran, Al-Baqarah 2:150)." This verse reaffirms the importance of facing the qibla, especially the Sacred Mosque in Mecca, when performing prayers. In addition to Surah Al-Baqarah, there are also references to the qibla direction in the hadiths of the Prophet Muhammad (peace be upon him), providing guidance to the Muslim community regarding the direction to face during prayer.

Anas bin Malik narrated that Prophet Muhammad (peace be upon him) led the prayer and then ascended the pulpit. Upon the pulpit, he pointed towards the qibla, gestured with his hand, and declared that from the time he led the prayer until that moment, he had been granted the opportunity to see both heaven and hell simultaneously in front of the mosque wall. The Prophet also expressed that on that day, he had never witnessed as much regarding goodness and evil. This statement was repeated three times (Hadith narrated in Sahih Bukhari).

In the early stages of Islam's development, determining the qibla direction was not an issue because during that period, Prophet Muhammad (peace be upon him) was still alive, and he directly indicated the qibla direction when outside the city of Mecca. After the Prophet's passing, the companions began using stars and the sun as guidance to determine the qibla direction. In the Arabian Peninsula, the main star used as a reference for determining the qibla direction was the Quṭbi/Polaris star (Nur Fadhilah & Pasca Sarjana Ilmu Falak UIN Walisongo Semarang, n.d.). In its journey, the classical method of determining the qibla direction, as recorded in fiqh literature, can be divided into three main categories: 1) sama-iyyah (relying on celestial objects to establish the qibla direction), 2) hawaiyyah (using wind directions as a guide for the qibla), and 3) ardhiyyah (using objects on the Earth's surface to determine the

qibla direction). These three methods can be employed by fulfilling two conditions: first, knowing the relative position to the Kaaba or the azimuth of the qibla, and second, having knowledge of the evidence for the qibla or indicators of the qibla direction (Aisyah & Hidayat, n.d.-a).

The measurement of the qibla direction in Indonesia has continued to evolve over time. Various methods and instruments, grounded in the sciences of astronomy and celestial navigation, have been employed, ranging from traditional approaches to those assisted by applications for precise qibla measurement. This article will elucidate the development of methods and instruments used in determining the qibla direction in Indonesia, progressing from ancient times using the Rubu' Mujayyab and compass to the utilization of modern applications. The use of modern applications in measuring the qibla direction continues to innovate, with several applications specifically designed to assist in the qibla measurement process in Indonesia.

RESEARCH METHODS

This research employs a Qualitative method with library research techniques that narrate or describe the research perspective based on the literature review itself. The data sources in this research include relevant books and journals on the history of the development of instruments and methods in measuring the qibla direction in Indonesia. The study also employs a historical approach, tracing the journey from the introduction of qibla direction measurement in Indonesia to modern measurements using applications (Azman & Helandri, 2022).

RESULTS AND DISCUSSION

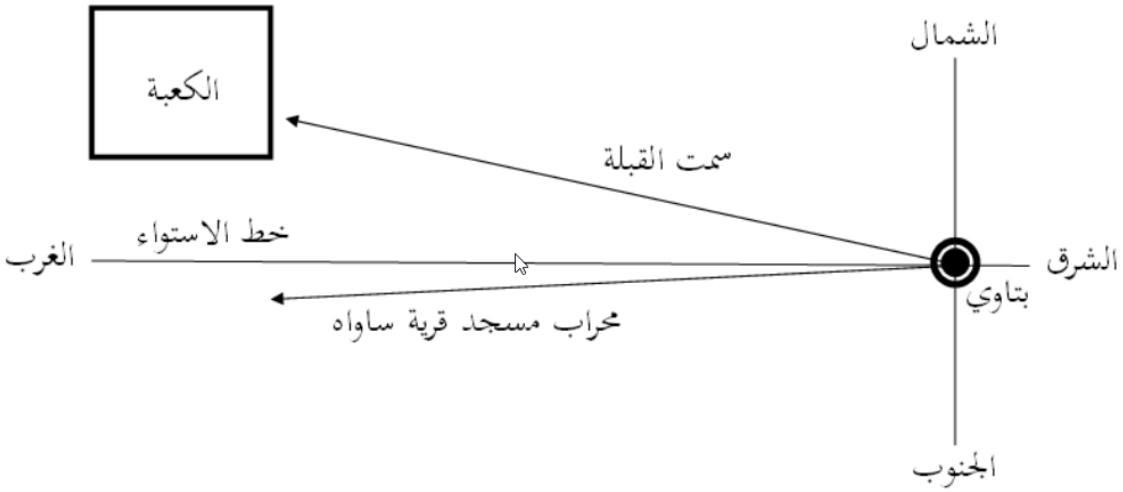
During the time of Prophet Muhammad (PBUH), initially, the direction of prayer (qibla) was towards the Baitul Maqdis in Palestine. However, Prophet Muhammad (PBUH) made efforts to ensure that the prayer continued to face the Ka'bah by positioning himself south of the Ka'bah and facing north. This way, the prayer was directed not only towards Baitul Maqdis but also remained oriented towards the Ka'bah. After Prophet Muhammad (PBUH) migrated to Madinah and continued to face Baitul Maqdis for 16 or 17 months, he encountered difficulty in facing two opposite directions. Prophet Muhammad (PBUH) earnestly wished for Allah's command to face the Ka'bah, as it was the qibla established by Prophet Ibrahim (AS). Although he did not directly request this change, Prophet Muhammad (PBUH) hoped to receive guidance from Allah. Eventually, the verse (Quran, Al-Baqarah, verse 144) was revealed.

From a historical perspective, the method of determining the qibla direction in Indonesia has evolved in line with the scientific advancements embraced by the Islamic community in the country. Additionally, the calculations used have also undergone evolution, including the utilization of coordinate data and measurement science systems, to provide convenience and guidance for Muslims in facing the qibla. Therefore, the contribution of Astronomy becomes crucial, especially considering the considerable distance between the Ka'bah and Indonesia, leading to many mosques not precisely facing the qibla (Angkat & Hidayatullah, 2021).

In Indonesia, the measurement of the qibla direction is anchored towards the west, resulting in the majority of places of worship in Indonesia facing west (Sriani & Ukhti, 2022). This causes confusion and raises questions about the accuracy of the qibla. In the authentic Hadith of Sahih Bukhari 380, Prophet Muhammad (PBUH) said: "When you enter the toilet, do not face towards the qibla, and do not turn your back to it. Instead, face either its east or west." The westward direction mentioned in the hadith is somewhat ambiguous, as it is advised not to face or turn away from the qibla in the toilet, implying that the westward direction does not necessarily always face the qibla. This confusion was prevalent in Indonesia in the past.

Sheikh Muhammad Arsyad Al Banjari, Sheikh Abdurrahman Al-Mishri, Sheikh Abdul Wahab Bugis, and Sheikh Abdussomad Palembang, known as the "Four Companions," returned to the Dutch East Indies and resided at the home of Sheikh Abdurrahman Al-Mishri Al-Batawi in 1772. Sheikh Muhammad Arsyad Al Banjari noted that at that time, the qibla direction of the mosque in Batavia did not point towards the Kaaba (Aisyah & Hidayat, n.d.-b). According to his school of thought, he believed that the qibla direction of the mosque needed to be changed because it deviated by up to 25 degrees. Leaving it unchanged was considered incorrect, as it could render prayers invalid. He corrected the qibla direction at Masjid Kampung Sawah Besar, Batavia, by shifting it by 25 degrees on Friday, the 2nd of Rabi'ul Akhir, in the year 1186 H. He carried out similar corrections in several other mosques.

Picture 1. The form of the qibla direction map in Batavia altered by Sheikh Arsyad to align with the direction of the Kaaba.



Sheikh Arsyad received tools and instruments that could be used to determine the qibla direction, such as a compass or Rubu Mujayyab. The use of Rubu Mujayyab to calculate the shadow of the qibla involves several important pieces of information, including the geographical latitude of the location, the qibla direction, and the solar declination. The process of calculating the shadow of the qibla requires detailed data

such as tafawut (difference in dates), which is needed to calculate the solar declination. The initial step is to determine the tafawut to be used, which then enables the determination of the solar angle. These tools are considered adequate in demonstrating the validity of facing the Kaaba direction in general accordance with Sharia provisions. Sheikh Muhammad Arsyad Al-Banjari played a leading role in the effort to determine the qibla direction in Indonesia, followed by figures such as Sayyid Usman bin Yahya, the Mufti of Betawi, and KH Ahmad Dahlan, the founder of Muhammadiyah (Aisyah & Hidayat, n.d.-a).

After changing the qibla direction at Masjid Kampung Sawah, Batavia, Sheikh Arsyad sparked controversy in the Jakarta community, especially after receiving a letter of objection from a Sufi sheikh at that time, namely Sheikh Abdullah bin Abdul Qohhar al-Jawi. Sheikh Abdullah expressed his objection to Sheikh Arsyad's decision to change the qibla direction of the mosques in Batavia, as no scholars had raised this issue before. This dispute involved the Governor-General of the Dutch East Indies, Petrus Albertus van der Parra (1761-1775), and a clergyman who was also an astronomer, Johann Mauritz Mohr (1716-1775). In the end, the arguments presented by Sheikh Arsyad were accepted by all parties, and the conflict concluded peacefully, as recorded in the treatise "Mas-alatul Qiblah fil Batawi" written by Sheikh Muhammad Arsyad al-Banjari in 1772 (Aisyah & Hidayat, n.d.-b).

In 1897, KH. Ahmad Dahlan, the founder of Muhammadiyah, carried out the reconstruction of the qibla direction. With his knowledge of astronomy (falak), Ahmad Dahlan endeavored to correct the qibla direction of Masjid Besar Kauman, which previously did not face the Kaaba but rather pointed towards Ethiopia. In the historical context, it is essential to acknowledge that the spirit of practical astronomical studies first emerged in Indonesia through the initiative of KH. Ahmad Dahlan, who successfully reconstructed the qibla direction. This historical fact indicates that Muhammadiyah not only claims to be a pioneer but also a major force in utilizing astronomical calculations to determine the timing and moments of worship in Indonesia (Rakhmadi et al., 2022)

The reconstruction carried out by KH. Ahmad Dahlan was presented with a more flexible method through a scientific approach, utilizing instruments such as a compass and a world map in modern astronomical methods. Although during that period, the local community had not fully embraced this change, KH Ahmad Dahlan politely sought to enlighten that Masjid Kauman in Yogyakarta did not actually face directly towards the Kaaba. The brief message conveyed by KH Ahmad Dahlan in the exploration of the qibla direction holds spiritual depth while also indicating a level of flexibility. He exemplified that Islam possesses an adaptive character, as long as it firmly adheres to fundamental values. (Azman & Helandri, 2022). The determination of the qibla direction for the construction of mosques in Indonesia reflects an attitude aligned with KH Ahmad Dahlan, the founder of Muhammadiyah, known as a

reformist scholar. This indicates that traditional Islamic thought is not always at odds with reformist Islamic thinking (mas' usdi, 2018).

The development of instruments to determine the qibla direction has undergone significant transformation, reaching the modern era. In classical times, the qibla direction was determined through observing the shadow of the sun or the position of the sun at sunrise and sunset. The use of the compass first emerged in the dynastic era, particularly in China. With technological advancements, the compass underwent various modifications and diversified uses, extending beyond the compass itself. This innovation not only involved original instruments but also encompassed various types of other instruments contributing to the development of qibla direction-determining tools. One such example is the Rubu' Mujayyab, a classical instrument first introduced in the 9th century (Hikmatul et al., n.d.).

After the entry of reformist Islamic thought, the measurement of the qibla direction continued to progress with the assistance of modern applications. One such example is using an Android compass with a magnetic system. Compass applications on Android devices come equipped with a daily qibla direction feature (rashdul qibla), making it easier for users to determine the qibla direction. (Mahtir et al., n.d.). The Android application "Easy Qiblat 3 in 1" is the creation of Ahmad Taufan Abdul Rashid in 2015, initially designed in a simple manner. In 2017, the application was updated and renamed to "Easy Qiblat." This compass provides accuracy through three methods simultaneously: utilizing map utilities, harnessing the directions of the sun and moon, and using a compass. (Ali & Ansori, n.d.).

The latest application, Qiblat Tracker, a device created by Mutoha Arkanuddin, an expert in Astronomy, plays a crucial role in determining the qibla direction and is recognized as the most advanced instrument compared to other tools used for similar purposes. It has a square shape and is equipped with a circle that functions similarly to a compass. This instrument can be used with two guidance methods: first, by relying on the true north direction based on celestial objects such as the sun, moon, stars, and planets, supported by Android software like sun compass and star walk 2. And second, by following the guidance of a compass. (Hikmatul et al., n.d.).

The superiority of Qiblat Tracker lies in its capability as the most modern device usable both day and night, boasting high time efficiency. It comes equipped with compass and celestial object modes, and is highly practical for portability and use. However, the weakness of Qiblat Tracker lies in its inability to operate in cloudy weather hindering celestial object observations. It is not recommended for measuring the qibla direction during the solar culmination, sunrise, and sunset. Additionally, the instrument is challenging to use at night if the surrounding conditions are too bright or there is light pollution. Qiblat Tracker, as a modern device in Astronomy, utilizes celestial objects to determine azimuth, both during the day and night, and is the creation of Mutoha Arkanuddin. Furthermore, there is the Tracker Phone instrument with a similar system to Qiblat Tracker but utilizes different objects, leveraging Android software like Star Walk 2. (Hikmatul et al., n.d.)

Over time, an astronomy application named Quran Kemenag has emerged, equipped with a qibla compass feature. The qibla compass function is one of the features in the Quran Kemenag application, providing convenience for Muslims to perform their daily prayers wherever they are. Quran Kemenag is an Android-based application or software that can be easily downloaded through Google PlayStore. This application has various features, and one of them is the qibla compass. The advantage of this qibla compass feature lies in the use of the device's compass sensor, allowing users to instantly determine the qibla direction. This feature begins with a calibration process that adapts to the surrounding environmental conditions. (Sriani & Ukhti, 2022).

The methods currently undergoing development require a higher level of understanding and information processing to be comprehended and applied. Therefore, only a few individuals or experts possess a profound understanding of how to calculate and measure the qibla direction. The use of Google Earth has become one highly accessible alternative for calibrating the qibla direction at a location. Overall, understanding the qibla direction involves one's ability to face directly towards the Kaaba. Meanwhile, Google Earth provides an accurate virtual representation of the Earth's surface. These two aspects complement each other. The presence of Google Earth streamlines several stages in the qibla measurement process, making it more practical. (Mustaqim, n.d.).

In 2023, students attempted to validate the measurement of the qibla direction by understanding the concept of spherical triangles. The qibla direction concept can be explored using the features of Geogebra, which are utilized to comprehend all principles of perpendicular lines, parallel lines, the concept of planar triangles, and the concept of spherical triangles involving the use of Geometry and 3D Graphics features. The geometry feature serves to understand and construct perpendicular lines, parallel lines, angles, and the concept of planar triangles. The Geogebra application is also capable of clearly visualizing the qibla spherical triangle. Essentially, the intersection of three large circles, including the qibla circle, forms eight spherical triangles. Based on the definition of the qibla direction as the nearest direction to the Kaaba through the large circles on the Earth's sphere, among the eight spherical triangles formed, only one spherical triangle indicates the shortest (nearest) distance from the location wishing to measure the qibla direction to the position of the Kaaba. (Azmi & Ukhti, 2023).

Mizwala Qibla Finder, created by Hendro Setyanto, an astronomy student from Bandung Institute of Technology in 2010, is one method and instrument for measuring the qibla direction. Meanwhile, Istiwa' Aini, which utilizes manual calculations of qibla azimuth and solar azimuth, was developed by Slamet Hambali. This tool is created using a scientific calculator and a formulaic system for calculations. Another alternative is to use a compass to determine the true north direction, which can then be easily utilized to determine the qibla direction. The use of a theodolite, commonly used in the field of geology, can also be applied in the field of astronomy. GPS (Global Position System) has become a tool that simplifies the

determination of latitude, longitude, direction, altitude, and other aspects. Additionally, various software programs related to Astronomy are available, accessible online, offline, and on Android platforms. (Hikmatul et al., n.d.).

CONCLUSION

Indonesia, due to its considerable distance from the city of Mecca and the lack of a direct line of sight to the Kaaba, generally determines its qibla direction towards Mecca. For those who have the capability and opportunity, it is crucial to exert effort to ascertain the true direction of the Kaaba, as this is considered an obligation. Two fields of study, namely astronomy and geography, can assist in these efforts. Therefore, the study of Islamic jurisprudence is considered dynamic, indicating that Islam, rooted in the guidance of the Quran and Sunnah, can adapt to changes in time and place. This also applies to the obligation of facing the qibla, where with technological advancements, regulations regarding the qibla direction need to follow better guidelines to enhance the steadfastness of worship. Although science provides information, religious authorities remain the ones to establish its laws.

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