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The Evolution of the Islamic Calendar and The Role of Department of Islamic Development Malaysia: Insight and Implementation in Malaysia

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Kata Kunci:
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Abstract:
This research explains the idea of an Islamic calendar system that grew in Malaysia as one of the Muslim countries that contributed to the falac science development in Southeast Asia. This article is a literature research with a historical approach to describe how the process of developing and adapting the Islamic calendar in Malaysia. The results shows that the system has changed five times, and the first period (before 1969-1986) used the Istilahi calendar. Meanwhile, the second (1986-1991) and third (19922-1994) periods used Ijtimak Hakiki and Ijtimak Wujudul Hilal. From 1995 to 2021, the fourth period used Imkanur Rukyat or Takwim Rukyat. In practice, the Imkanur Rukyat is similar to Imkanur Rukyat MABIMS (2,3,8). Since 1 Muharam 1443 H/2021, the fifth period employs a new criterion to determine the beginning of the lunar month, namely the MABIMS Hilal Neo-Visibility (3,6.4). Main efforts to unify the Islamic calendar in Malaysia are made by publishing the Hijri Almanac based on the MABIMS hilal visibility theory, which is used as an administrative and worship reference. The hilal observations are still carried out, and can change the dates in the almanac, as happened in the determination of beginning of Shawwal 1443 H/2022.

Abstrak:
Penelitian ini menguraikan gagasan sistem kalender Islam yang berkembang di Malaysia sebagai salah satu negara Muslim yang berkontribusi terhadap perkembangan ilmu falak di Asia Tenggara. Artikel ini merupakan penelitian pustaka dengan pendekatan historis untuk menggambarkan proses pengembangan dan adaptasi kalender Islam di Malaysia. Hasil penelitian menunjukkan bahwa sistem tersebut telah mengalami lima kali perubahan, dan periode pertama (sebelum 1969–1986) menggunakan kalender Istilahi. Sementara itu, periode kedua (1986–1991) dan ketiga (1992–1994) menggunakan Ijtimak Hakiki dan Ijtimak Wujudul Hilal. Dari tahun 1995 hingga 2021, periode keempat menggunakan Imkanur Rukyat atau Takwim Rukyat. Dalam praktiknya, Imkanur Rukyat mirip dengan Imkanur Rukyat MABIMS (2,3,8). Sejak 1 Muharam 1443 H/2021, periode kelima menerapkan kriteria baru untuk menentukan awal bulan lunar, yaitu MABIMS Hilal Neo-Visibility (3,6.4). Upaya utama untuk menyatukan kalender Islam di Malaysia dilakukan dengan menerbitkan Almanak Hijriyah berdasarkan teori visibilitas hilal MABIMS, yang digunakan sebagai acuan administratif dan ibadah. Pengamatan hilal masih dilakukan, hasilnya dapat mengubah

	tanggal dalam almanak, sebagaimana kasus yang terjadi dalam penentuan awal Syawal 1443 H/2022 M.

A. Introduction

The development of the Islamic calendar system demonstrates a continuous dynamic, evolving from traditional moon sighting (*rukyat*) methods toward approaches increasingly integrated with astronomical calculation (*hisab*) and modern technology. The determination of the beginning of the Hijri month, which depends on the visibility of the crescent moon (*hilal*),[1] affects not only the performance of religious rituals but also the social order of Muslims globally,[2] thereby encouraging the emergence of various innovations in computational models and digital calendar applications. Nevertheless, there remains an academic gap in examining the role of state-level official institutions in this evolutionary process, particularly in terms of policy, standardization, and the integration of *rukyat* and *hisab*.[3] Malaysia, as one of the Muslim-majority countries actively contributing to the development of the Islamic calendar through institutional bodies such as the Department of Islamic Development Malaysia (DDIM), represents a significant case. However, studies specifically addressing the institutional contribution of this body to the evolution of the Islamic calendar remain limited. Therefore, this study aims to fill this gap by analyzing the development of the Islamic calendar and the strategic role of authoritative institutions in Malaysia in shaping a more systematic and adaptive system for determining the beginning of Hijri months in line with advancements in science and technology.

This study formally examines the institutional and methodological evolution of the Islamic calendar, with a particular focus on how state authority, scientific practice, and regulatory frameworks interact in shaping a standardized Hijri calendar system. Malaysia is selected as the primary object of analysis due to its distinctive and consistent approach in integrating traditional Islamic astronomical principles with centralized governance through

[1] Anwar Halari, Nongnuch Tantisantiwong, David M. Power, and Christine Helliar, "Islamic calendar anomalies: Evidence from Pakistani firm-level data," *The Quarterly Review of Economics and Finance* 58 (2015): 64-73. https://doi.org/10.1016/j.qref.2015.02.004

[2] Muh Rasywan Syarif, Sakirman Sakirman, and Muhammad Fazlurrahman Syarif, "A Semantic Literature Review on Crescent Visibility: Trends, Models, and Implications for the Islamic Calendar," *Al-Hilal: Journal of Islamic Astronomy* 7, no. 1 (2025): 67-88. https://doi.org/10.21580/al-hilal.2025.7.1.26099

[3] Husnul Qodim, and Robbi Rahim, "Islamic calendar: prototype of Hijri calendar application using rapid application development method," In *2019 7th International Conference on Cyber and IT Service Management (CITSM)*, vol. 7, pp. 1-4. IEEE, 2019. https://doi.org/10.1109/CITSM47753.2019.8965410

institutions such as the Department of Islamic Development Malaysia (DIDM). Historically, the development of calendar systems in the Malay world has reflected a synthesis of Islamic scientific heritage and local adaptation.[4] In the contemporary context, Malaysia continues this trajectory by actively adopting and implementing regional standards such as the MABIMS criteria,[5] while maintaining a uniform, centralized system applied across all states. This contrasts with more decentralized models in other countries and highlights Malaysia's unique position as a case study for examining the role of institutional authority in achieving calendar standardization. Therefore, Malaysia provides a relevant and strategic context for analyzing how scientific, historical, and policy-driven elements converge in the ongoing evolution of the Islamic calendar.[6]

A number of scholars have examined the determination of the beginning of Islamic months from both regional and theoretical perspectives. Empirical studies, such as Determination of Islamic Month Start by Moonsighting Australia (Case Study: 1 Dzulhijah 1441),[7] highlight the practical challenges of moon sighting across different geographical contexts, particularly in Asia and Australia. From a jurisprudential perspective, At-Taqwim Al-Qamari Al-Islami Al-Muwahhad Bidayah Al-Yaum Wa Ru'yah Al-Hilal Min as-Satil[8] emphasizes key fiqh factors, including the debate between *hisab* (calculation) and *ru'yah* (observation), as well as issues related to time boundaries in determining the start of the lunar day.[9] Meanwhile, technical and astronomical discussions are addressed by Visibilitas Hilal Minimum: Studi Komparatif Antara Kriteria Depag RI dan Astronomi, who explores

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[4] R. Embong, B. Zainal, Z. Mohd Yusoff, and NN Md Shariff, "Educational Insights From The Astronomical Foundations Of Pre-Modern Malay Calendars: Bridging Islamic Science And Mathematics With Historical Timekeeping Practices." In *EDULEARN24 Proceedings*, pp. 6350-6357. IATED, 2024. 10.21125/edulearn.2024.1498

[5] Achmad Mulyadi, Siti Musawwamah Mamah, Hosen Hosen, and Mohd Saiful Anwar Saiful, "Dynamics of Implementing the New MABIMS Criteria on the Hijri Calendar (Takwīm Hijri) By the Indonesian and Malaysian Governments." *Al-'Adalah* 22, no. 2 (2025): 381-408. https://doi.org/10.24042/adalah.v222.28543

[6] Raihana Abdul Wahab, Mohammaddin Abdul Niri, Muhammad Syazwan Faid, Mohd Saiful Anwar Mohd Nawawi, and Nurul Kausar Nizam, "An Analysis of Takwim Hijriah Khairiah in the Context of Historical Development of the Malaysian Hijri Calendar," *Journal of Al-Tamaddun* 20, no. 2 (2025): 335-343. https://doi.org/10.22452/JAT.vol20no2.23

[7] Fatmawati Fatmawati, Andi Muhammad Akmal, Andi Muh Akhyar, Azwar Azwar, and Achmad Nasyori, "Determination of Islamic Month start by moonsighting Australia (case study: 1 Dzulhijah 1441)." *Journal of Islamic Thought and Civilization* 12, no. 2 (2022): 225-241. https://doi.org/10.32350/jitc.122.16

[8] Jamaluddin Abdurraziq, "at-Taqwim al-Qamari al-Islami al-Muwahhad Bidayah al-Yaum wa Ru'yah al-Hilal min as-Satil," *asy-Syuhur al-Qamariah wa at-Taqwim al-Islami* (2005): 14-22. https://doi.org/10.22452/JAT.vol19no1.18

[9] Ach Mulyadi, "Melacak Geneologi Sistem dan Penerapan Mazhab Hisab Pesantren Karay Ganding Sumenep." *NUANSA: Jurnal Penelitian Ilmu Sosial dan Keagamaan Islam* 8, no. 1 (2011). https://doi.org/10.19105/nuansa.v8i1.1

differences among *hisab* methodologies (taqribi, tahqiqi, and contemporary approaches) and debates among *ru'yah* experts, particularly concerning *mathla'* (lunar visibility zones). Despite these contributions, the existing literature tends to treat fiqh and astronomical aspects separately, leaving a gap in understanding how both dimensions are integrated within institutional and policy frameworks at the state level.

Concerning the unification of the Islamic calendar in Malaysia, the role of reformers is significant. Therefore, this study examines the dynamics of Islamic calendar thinking and the Department of Islamic Development Malaysia (DIDM) 's role in unifying the Islamic calendar. The Islamic calendar has been examined by several previous analyses conducted by Mohammad Zambri Zainuddin, Baharrudin Zainal, Kassim Bahali, and Mohd Saiful Anwar Mohd Nawawi. The literature is used as the main reference and followed up by understanding the dynamics of the developing Islamic calendar system, including the MABIMS Hilal Neo-Visibility (3,6.4) criteria and DIDM involvement in realizing the unification of the calendar.

B. Method

This study is a literature review that employs a historical approach to provide an in-depth description of the process of transformation and adaptation of the Islamic calendar system in Malaysia. Data were collected through a review of authoritative literature regarding the dynamics of dating criteria across five distinct periods, encompassing the transition from the Istilahi method to the implementation of the MABIMS Hilal Neo-Visibility (3, 6.4) criteria, which have been in effect since 2021. Data analysis was conducted using a descriptive-analytical approach to evaluate efforts to unify the calendar through the publication of the Hijri Almanac, aiming to ensure integration between the latest findings in astronomical science and the administrative and religious needs of the community. The use of this methodology aims to produce an accurate scientific description of scholarly developments in Southeast Asia, in line with academic research standards that are responsive to changing social needs and advancements in science and technology.

C. Result

The Islamic calendar system has developed according to the demands of the times. The first period (before 1969-1986) used the Istilahi calendar based on urfi reckoning. However, in determining the beginning of Ramadan and Shawwal, it needs to wait for the

results of observations. In this period, astronomers from each state compiled the Islamic calendar based on different theories. The second period (1986-1991) used the Ijtimak Hakiki Calendar. The new date begins when the ijtimak event occurs before sunset. This theory was used to determine all the beginnings of the lunar month except Ramadan and Shawwal using the hilal visibility from the 1978 Istanbul-Turkey conference, adapted to Malaysian conditions as in the previous period. Therefore, the specified conditions are used alternatively, not cumulatively. The third period (1992-1994) used the ijtimak Wujudul Hilal calendar. In this calendar, a new date is considered to start when there has been ijtimak before and after sunset. This theory was used for all lunar months except Ramadan and Shawwal. The use of this calendar system only lasted for two years. The fourth period runs from 1995 to 2021 using the Imkanur Rukyat or "Takwim Rukyat" calendar. In practice, the Imkanur Rukyat used was the MABIMS imkanur rukyat (2,3,8). According to the duties and functions, DIDIM has a very strategic role in unifying the Islamic calendar in Malaysia. Even though MABIMS hilal visibility theory has been entirely accepted and used as a guide in making Islamic Almanacs, it needs to be reviewed according to the times' demands, scientific development, and technology. This awareness is continued through collaboration with various parties domestically and abroad. In the fifth period since 1 Muharram 1443 H/2021, Malaysia uses a new criterion to determine the lunar month's beginning, namely the MABIMS Hilal Neo-Visibility (3,6.4).

D. Analysis and Discussion

1. The Development of Islmic Calendar Thought in Malaysia

The polemics between the traditionalists and reformists in Malaysia brought a current of change in religious, social, economic, and political thought. Islam is the official religion in Malaysia, and Malays are categorized as Muslims.[10] The religious style of the community is ahlu as-sunnah wa al-jama'ah in terms of aqidah and fiqh. The Ash-Ariyah and Maturidiah understandings are the official guidelines in the field of faith, while the Shafi'i school is the guide in law and religious practice.[11] The Shafi'i school's influence is powerful and still held by the Malay community, especially in the Kelantan, Kedah, and Terengganu regions. Meanwhile,

[10] Mohammad Hashim Kamali, *Membumikan Syariah: Pergulatan Mengaktualkan Islam*, (Bandung: Mizan, 2013).

[11] Saadan Man et al., "Kesesuaian Pemikiran Dan Amalan Mazhab Selain Syafi'i Dalam Masyarakat Islam Di Malaysia: Satu Analisis Awal," *Jurnal Fiqh* 6 (2009): 21–40. https://doi.org/10.22452/fiqh.vol6no1.2

schools other than Syafi'i have fewer places in Malaysia.[1213] Saadan Man stated that the efforts of the reformist movement (Islah movement) that fought for the freedom of the school faced challenges. This is because they were considered deviant, which challenged stability and unity. In contrast, the reformists consider that the traditional group's attachment to the Shafi'i school is an extreme taasub attitude prohibited by religion and "stifles" the thoughts of individual Muslims.

In the study of fiqh, the reformist group offers the Qur'an and as-Sunnah with the "Fiqh al-Muqaran" approach to free society's attachment to the Shafi'i school.[14] This learning method is considered better than the traditional model because it offers alternatives and follows the demands of the times. The polemic of these two groups has been going on for a long time, negatively impacting Malaysia's Muslims' lives.[15] However, this generated positive values, namely the change in the traditional circles of their attitude toward accepting the views of other schools. They could not accept other schools, and in the modern era, scholars slowly appeared open to accepting ideas outside the Shafi'i school, especially in the fields of mu'amalat and Islamic finance.

In the field of worship, it also appears to accept the thoughts of other schools, such as not canceling wudu when touching a man and a woman while conducting tawaf, being allowed to pay zakat with money, and accepting the use of reckoning imkanur rukyat to determine the beginning of the lunar month.[16]

As described earlier, the polemics between the traditionalists and reformists brought a current of change in religious, social, economic, and political thought. In the religious context, open-mindedness appears at the university level, especially on campuses with Islamic studies faculties, such as Universiti Malaya, Universiti Kebangsaan Malaysia, and International Islamic University Malaysia.

The model developed in the various universities is Problem-Based Learning, which differs from Islamic Boarding Schools. In 1428/2007 in Malaysia there were not many lecturers with expertise in Islamic Studies. According to the Direction of Academic Profiles of

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[12] Hasnan Kasan, *Institusi Fatwa Di Malaysia*, (Penerbit Universiti Kebangsaan Malaysia, 2008).

[13] Lahaji, "Pelembagaan Hukum Islam (Studi Tentang Peradilan Islam Dalam Politik Hukum Di Indonesia Dan Malaysia," (UIN Sunan Kalijaga Yogyakarta, 2010).

[14] Saadan Man, *Islamic Reform: The Conflict Between Tradisionalists and Reformists Concerning Matters of Ibadah in Contemporary Malaysia*, (University of Edinburgh, 2004).

[15] Abdul Rahman haji Abdullah, *Pemikiran Islam Di Malaysia*, 1st ed. (Jakarta: Gema Insani Press, 1997).

[16] Man et al., "Kesesuaian Pemikiran Dan Amalan Mazhab Selain Syafi'i Dalam Masyarakat Islam Di Malaysia: Satu Analisis Awal."

the Malaysian Ministry of Higher Education, there are only 29 people.[17] Contemporary thoughts are also studied using an integrated approach to respond to the problems faced. The idea of the need for "Malaysian Fiqh" emerged following the realization of the increasingly complex problems of Islamic studies and the tug-of-war between text and reality, as stated by Mahmud Zuhdi pioneered this idea.[18] According to him, the Malaysian Islamic community has specific characteristics that differ from the Muslim community in the Middle East. Consequently, a new approach is needed to understand the message of the text and the demands of the reality faced.[19] During the reign of Abdullah Ahmad Badawi as the successor of Tun Mahathir Mohamad, modern Islamic thought gained support from the authorities.[20] Islamic values were introduced in governance under the rubric of "Islam Hadari" (Islam of Civilization). Mohammad Hashim Kamali mentioned:

> "Abdullah Ahmad Badawi preferred to use "Islam Hadari" instead of the more familiar and popular terms *hadharah Islam* or *hadharah Islamiyyah* (Islamic civilization) to emphasize broader Islamic values that are relevant to Malaysia today. This term is related to Islamic values and their relevance to other civilizations, religions, and cultures. The term is a positive response to the cultural dimension of globalization which is more similar to the value structure of Western civilization and its scientific and technological achievements. Concern was expressed on how Muslims can engage constructively with modernity. *Islam Hadari* wants to focus on the structure of values and relationships with modernity in the present and a progressive perspective on prosperity and economic development."[21]

The quote above describes the progress to be realized based on Islamic values. Religious thought is given a space to develop and is open to accepting the views of other schools but is guarded to maintain the benefit and integrity of the Muslim community. In the case of determining the beginning of the lunar month, especially the beginning of Ramadan and Shawwal, the thoughts of the Malaysian community also experienced developments. Mohd Saiful Anwar Mohd Nawawi explained that the Islamic calendar criteria have developed

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[17] Mohd Fauzi Hamat, Joni Tamkin Borhan, and Ab Aziz Mohd Zin, *Pengajian Islam Di Institusi Pengajian Tinggi Awam Malaysia,* (Penerbit Universiti Malaya, 2007).

[18] Hamid Fahmi Zarkasyi, *Metodologi Pengkajian Islam Pengalaman Indonesia-Malaysia*, ed. Mohd Fauzi Hamat (ed.), 1st ed. (Ponorogo: Gontor, 2008).

[19] Paizah Haji Ismail and Ridzwan Ahmad, *Fiqh Malaysia: Ke Arah Pembinaan Fiqh Tempatan Yang Terkini* (Akademi Pengajian Islam, Universiti Malaya, 2000).

[20] Chamil Wariya, "Potret Peribadi Abdullah Ahmad Badawi," *(No Title)*, 2006.

[21] Kamali, "Membumikan Syariah: Pergulatan Mengaktualkan Islam."

according to the times' demands, which were divided into four periods.[2223] The first period (before 1969-1986) used the Istilahi calendar based on urfi reckoning. However, determining the beginning of Ramadan and Shawwal still waits for the results of observations. In this period, astronomers from each state compiled the Islamic calendar, and the theories used differed, often leading to differences. Considering the diversity of methods developed in 1392/1972, the National Council for Islamic Affairs (NCIA) was established to harmonize the methods used in determining the beginning of Ramadan, Shawwal, and Zulhijah. NCIA determined three locations for the hilal observation post to be used as references, namely Sayak Island, Kuala Muda Kedah, Johor Bahru Royal Official Building, and Teluk Kemang Port Dickson Negeri Sembilan.[24]

In its journey, there were often differences in determining the beginning of Ramadan and Shawwal between 1978-1982 because only rukyat was used. Therefore, when the crescent moon is not successfully rukyat on the 29th (Syakban or Ramadan), the current month is completed (istikmal) at 30 days. Conversely, when the crescent moon is successfully rukyat, the night has entered a new date (Ramadan or Shawwal) on the 29th (Syakban or Ramadan). This situation prompted NCIA to form The Committee to Determine the Beginning of Ramadan and Shawwal (CDBRS) in 1402/1982, which consisted of state Muftis, representatives of the Malaysian Department of Survey and Mapping Malaysia (DSM), and Islamic astronomers from various Universities. This position produces recommendations for improving the rukyat accounting method through the approval of the King Assembly. Zainal said "When the Ramadhan and Shawwal are not visible due to the weather conditions, the hilal is still there and can be seen, then the calculations of the astrologers can be used."[2526]

To implement the recommendations according to astronomical rules, CDBRS in the month of Jumadil Akhir 1403/April 1983 used the visibility from the Istanbul Turkey conference 1398/1978, with the provisions of the hilal height of at least 5° 30' above the

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[22] Mohd Saiful Anwar Mohd Nawawi, *Penilaian Semula Kriteria Kenampakan Anak Bulan Di Malaysia, Indonesia Dan Brunei* (Jabatan Fiqh dan Usul, Akademi Pengajian Islam, Universiti Malaya, 2014).

[23] Mohd Saiful Anwar Mohd Nawawi et al., "Sejarah Kriteria Kenampakan Anak Bulan Di Malaysia (History of the Criteria for Lunar Crescent Visibility in Malaysia)," *Journal of Al-Tamaddun* 10, no. 2 (2015): 61–75. https://doi.org/10.22452/JAT.vol10no2.5

[24] Baharrudin Zainal, *Ilmu Falak: Teori, Praktek, Dan Hitungan* (Kolej Ugama Sultan Zainal Abidin, 2003).

[25] Prof Zainal and Ahmad Taufan Abdul Rashid, *Kemajuan Kaedah Hitungan Falak* (Penerbit UniSZA, 2019).

[26] Susiknan Azhari, Prof Zainal, and Ahmad Taufan Abdul Rashid, *Penyatuan Kalender Islam Dari Solidaritas Individual-Sektarian Menuju Solidaritas Kebangsaan-Keumatan*, *Yogyakarta: Museum Astronomi* (Penerbit UniSZA, 2019).

horizon and a minimum elongation of 7° 30'. According to Abdul Hamid Tahir, the conditions produced by the Istanbul-Turkey conference are very difficult to use because of its geographical position. Therefore, the Assembly included the minimum age of the month of 8 hours as an alternative requirement. In Malaysia there are differences regarding the origin of the age requirement of 8 hours. Mohd Khair believes that it comes from the Istanbul Turkey Conference, while Abd. Hamid stated that it has long been practiced in Malaysia. Meanwhile, Mohd Saiful Anwar stated that the age requirement for the month of 8 hours was the result of Mohd Khair Mohd Taib's ijtihad.[27][28]

The theory has been used since 1983, as in the case of determining the beginning of Ramadan 1405. Despite In practice, there are still differences when determining the beginning of Ramadan 1403 H. Perak and Johor set the beginning of Ramadan 1403 on June 12, 1983. Meanwhile at the central level set the beginning of Ramadan 1403 on June 13, 1983. This difference occurred due to Negeri Perak and Johor uses the form of the hilal, while the central government uses the visibility of the hilal. According to the reckoning, 1 Syakban 1405 coincided with April 21, 1985, and 29 Syakban 1405 fell on May 19, 1985 (rukyat performed in the afternoon). The Ijtimak of the beginning of Ramadan 1405 has not yet occurred. Furthermore, the sunset over Teluk Kemang Port Dickson Negeri Sembilan at 7:17 PM and the moon set at 6:52 PM, 25 minutes earlier than the sun. This means that the hilal has not yet existed, and rukyat could be conducted. The Ijtimak of the beginning of Ramadan 1405 occurred on May 20, 1985, at 5:41 AM, and more details are shown in the table below.

Hilal position at 19.05.85 and 20.05.85 Source:[29]

(29 Syakban)	19.05.85	20.05.85	Terms of Hilal Visibility in Turkey 1978
Hilal Altitude	-5 50'	+4 54'	+5 30'
Elongation	-		7 30'
Moon Age	-	13h 36m	8 h
The emergence of the new crescent at the beginning of Ramadan	Hasn't	Has	

[27] Abdul Hamid Tahir, *Unsur-Unsur Astronomi Praktik Untuk Kegunaan Ukur Tanah*, 1st ed. (Johor: Universiti Teknologi Malaysia, 1990).

[28] Haji Md Khair Haji Md Taib, *Takwim Hijriah Khairiah*, 1st ed. (Bangi: Penerbit Universiti Kebangsaan Malaysia, 1898).

[29] Tahir, *Unsur-Unsur Astronomi Praktik Untuk Kegunaan Ukur Tanah*.

The age of Syakban 1405 was completed by thirty days (*istikmal*), and the beginning of Ramadan 1405 was set to fall on May 21, 1985. During this period, the Malaysian Falak Syarie Association was founded (29 Zulhijah 1403/7 October 1983) to gather all experts and enthusiasts of Islamic astronomy and as a forum for discussion. One of the initiators of the Malaysian Falak Syarie Association was Tuan Haj Moh Khair bin Hj Mohd Taib (8 September 1922-28 October 1989). After he died the development of Islamic astronomical studies was continued by Tuan Guru Tuan Haji Ab Rahman b Hussain.[30] The second period (1986-1991) used the Ijtimak Hakiki Calendar. The event occurs before sunset, prior to the beginning of a new date. However, when Ijtimak occurs after sunset, it is not considered a new date, or the current month is continued to be thirty days. This theory is used to determine all the beginnings of the lunar month except for Ramadan and Shawwal using the visibility of the hilal resulting from the Istanbul Turkey 1398/1978 conference, which has been adapted to Malaysian conditions as in the previous period. Therefore, the specified conditions are used alternatively, not cumulatively. This can be considered in determining the beginning of Ramadan 1407 H. According to reckoning data, the 29th of Syakban 1407 coincided with Tuesday, April 28, 1987. During this period, the Ijtimak of the beginning of Ramadan 1407 H occurred at 9:34. The sun and moon set at Teluk Kemang Port Dickson Negeri Sembilan around 7:16 PM and 7:29 PM Malaysian time, with 13 minutes differences. Therefore, "moonset after sunset" can be observed, and more details are shown in the table below.

Comparison of the Position of the Hilal in Teluk Kemang at Sunset with Turkey Hilal Visibility 1978 Source:[31]

	28.04.87	Hilal Visibility Requirements
Hilal Altitude	+02 19'	+5 30'
Elongation	4 34'	7 30'
Moon Age	09h 42m	8h
The emergence of the new crescent at the beginning of Ramadan	Has	

[30] Susiknan Azhari, "Perkembangan Kajian Astronomi Islam Di Alam Melayu," *Jurnal Fiqh* 7 (2010): 167–84. https://doi.org/10.22452/fiqh.vol7no1.8

[31] Tahir, *Unsur-Unsur Astronomi Praktik Untuk Kegunaan Ukur Tanah*.

The table above shows that of the three specified conditions, only one is met: the month's age (9 h 42 m). Since an alternative guideline was used, this condition is considered to have met the visibility of the hilal. The beginning of Ramadan 1407 fell on Wednesday, April 29, 1987, even though on April 28, 1987, it did not succeed in seeing the hilal. During this period, Malaysia's efforts to realize an international Islamic calendar had long been initiated by Mohammad Ilyas. This was through the "World Conference on International Islamic Calendar" on 29 Rabiul Awal- 1 Rabiul Akhir 1412/October, 8 - 10 1991 at Universiti Sains Malaysia Pulau Pinang and the inauguration of the Sheikh Tahir Falak Center. This conference produced eighteen recommendation points, the "Penang Declaration on the International Islamic Calendar."[3233] The problem of differences will be solved when Islamic states are vital in science and technology.

The third period (1992-1994) used ijtimak Wujudul Hilal. In this calendar, a new day is considered to have started when there has been ijtimak and the position of the hilal above the horizon before and after sunset. This theory is used for all lunar months except Ramadan and Shawwal, which still uses the visibility of the hilal in the previous period. The use of this calendar system only lasted for two years.

The fourth period runs from 1995 to 2021 using the Imkanur Rukyat or "Takwim Rukyat."[34] In practice, the Imkanur Rukyat used is Imkanur Rukyat MABIMS, commonly known as IR MABIMS 2.3.8. The beginning of the lunar month begins when sunset meets the following conditions. The altitude of the hilal is not less than 2° AND The curvature (elongation) of the sun to the moon is not less than 3° OR The age of the moon is not less than 8 hours after setting.[35]

The terms above are alternatives, and when the altitude and elongation have been fulfilled, the next day is considered to have entered the beginning of the lunar month. Similarly, when the altitude and elongation have not been fulfilled, unlike the moon's age, the next day is also considered to have entered the beginning of the lunar month. This method is suitable for Ramadan, Shawwal, and Zulhijah. In the calculation process, two locations (Markaz) are used as references: Tanjung Atiam Sabah and Tanjung Chinchin Langkawi. They are used

[32] Mohammad Ilyas and Zhari Ismail, *Towards a Unified World Islamic Calendar: The Penang Declaration and World Conference Report* (Penang: USM, 1992).

[33] Mohammad Ilyas, *Kalender Islam Antarabangsa* (Dewan Bahasa dan Pustaka, 1996).

[34] Taib, *Takwim Hijriah Khairiah*.

[35] Ahmad Yusof Farid b Abdullah, *Kaedah Penetapan Awal Ramadhan & Syawal Dan Pembentukan Taqwim Hijri Di Malaysia* (Pinang: Jabatan Mufti Pualu Pinang, n.d.).

according to geographic location to represent the entire region in Malaysia. Tanjung Chinchin and Tanjung Atiam Sabah are at the westernmost and easternmost locations. Therefore, it is expected that all regions in Malaysia will be represented. The information gathered is derived from one of the Markaz to determine the commencement of the lunar month. This means that when one markaz meets the requirements for the MABIMS hilal visibility, the next day is determined as the beginning of the lunar month. For example, the following is the initial determination of Shawwal 1432 H.

Data on Hilal Position 29 Ramadan 1432/August 29, 2011 Source:[36]

Location	Sunset	Hilal Altitude	Elongation	Moon Age	Conclusion
Tanjung Chinchin	18.11	00 07'	06 16'	7h 09m	Hasn't
Tanjung Atiam	19.3	00 35'	06 42'	8h 30m	Has
Terms of MABIMS Hilal Visibility		02 00'	03 00'	8h 00m	

The hilal altitude and the elongation of the two locations do not fulfill the requirements for the MABIMS Hilal visibility and the moon age in Tanjung Chinchin. However, the moon age in Tanjung Atiam has met the requirements of MABIMS hilal visibility, which is 8 hours 30 minutes, and the beginning of Shawwal 1432 is set to fall on August 30, 2011. During this period, the calendar system used was well-established and consistent. This is because the beginnings of the lunar month use the same theory, namely the MABIMS hilal visibility, without waiting for the observations According to Azhari Muhammad previously, the theory of Imkanur rukyat was only used to determine the beginning of Ramadan, Shawwal, and Zulhijah. The other months use the form of the hilal. However, since 1995 the Technical Authority for the Islamic Calendar has stipulated the use of imkanur rukyat for all Malaysian hijri months and takwim. Therefore, Mohammad Odeh included Malaysia as one of the states with an established Islamic calendar at the conference in Istanbul, Turkey, in 1436/2013.[37]

In the fifth period, from 2021 until now, the criteria of MABIMS Hilal Neo-Visibility (3.6.4) are still used. This is the implementation of the MABIMS Muzakarah 1437/2016 decision in Teluk Kemang Negeri Sembilan Malaysia, which Indonesia, Malaysia, Singapore, and Brunei Darussalam attended. The inauguration was conducted at the beginning of

[36] Nawawi, "Penilaian Semula Kriteria Kenampakan Anak Bulan Di Malaysia, Indonesia Dan Brunei."

[37] Susiknan Azhari, "Catatan & Koleksi Astronomi Islam Dan Seni," *Yogyakarta: Museum Astronomi Islam Dan Pintu Publishing*, 2015.

Muharram 1443 H. In this new criterion, the lunar month begins at sunset after meeting two conditions: the hilal altitude and an elongation of 3° and 6.4°.[38]

2. The Role of DIDM in the Unification of the Islamic Calendar in Malaysia

Department of Islamic Development Malaysia (DIDM) or JAKIM was initiated by the Secretariat of the National Assembly for Malaysian Islamic Religious Affairs (SNAMIRA), which was at the Prime Minister's Office, and this institution has been operating since 1970. Since the past ten years (1970-1980), twenty National Assembly trials have been held regarding the issue of the Islamic religion in Malaysia. There were two hundred issues discussed, such as the establishment of the Institute for Islamic Da'wah and Training (IIDT), the Islamic Research Center (IRC), the Malaysian Islamic Da'wah Foundation (MIDF), the College of Islamic Teachers (CIT), the Religious High School of Sarawak, Ma'had Tahfidz Al-Qur'an wa Al-Qira'ah, and the Institute for Harmonizing and Islamic Education (IAIE).[39]

In 1984, the organizational structure of the Religion Division of the Prime Minister's Department was enlarged. It was changed into the Islamic Affairs Division (IAD) Prime Minister's Department, which has planned, coordinated, evaluated, and provided input on various Islamic activities since the 1st of Ramadan 1405 coincided with May 21, 1985. This aimed to hinder conflicts between the state and Islamic interests. Other responsibilities include planning different programs and establishing partnerships with international parties to enhance the quality of Islamic preaching. Furthermore, IAD has fourteen divisions for the stated tasks.

IAD was elevated to DIDM following the development of the times and the needs of the Malaysian Muslim community on January 1, 1997. At the beginning of the establishment, DIDM had 14 (fourteen) sections and has grown to 19 (nineteen). This agency is led by a Director General and assisted by three Deputies (Deputy Director General of Policy, Deputy Director General of Human Development, and Deputy Director General of Management). Currently, the office is located at the Putrajaya Islamic Complex. DIDM has three functions: the standardization of Sharia law, the coordination of Islamic administration, and the

[38] Jakim, "Takwim 2019," 2019, https://www.e-solat.gov.my/portalassets/files/Penerbitan/TAKWIM_2019.pdf.

[39] Jakim, "History of JAKIM," 2020, https://www.islam.gov.my/en/corporate-info/jakim-s-profile/history.

coordination and development of Islamic education. Following its duties and functions, it has a strategic role in unifying the Islamic calendar in Malaysia.[40]

Various activities are carried out, such as developing observatories in each country. One of the observatories pioneered by IAD is the Langkawi National Observatory. It is used as a research and development center for human resources through various training, with 70% research and 30% training.[41] Furthermore, guidelines are made by publishing a book of worship on the International Space Station (ISS) used by Sheikh Muszhaphar Shukor. This book contains guidance on the procedures for resting, determining prayer times, the direction of Qibla, and fasting in the space. The critical effort made to unify the Islamic calendar is to publish a Hijri Almanac using the MABIMS hilal visibility theory.[42] This almanac is guided and used as a reference in administration and worship. Therefore, determining the beginning of Ramadan and Shawwal refers to the almanac, although observation activities are still carried out throughout the state. In other words, the results of observations will not change the date listed in the almanac. However, it can be used as a data source in building a new theory. This is a vital role DIDM performs in realizing Ramadan's beginning and ending.

Apart from the DIDM Islamic Almanac in Malaysia, several Urfi calendars (Taqwin Hijri Istilahi) were compiled by Sheikh Ahmad al-Fatdany (1889 AD/1308 H) and Haji Abdul Lathif Tambi al-Malakawi.[43] Al-Fatdany's urfi calendar is based on the manuscript of the Jadwal Yu'lam Minha Awa'il as-Sinin wa ash-Syuhur al-'Arabiyyah bi Sundulahi. It is arranged using the average value of the moon's cycle around the Earth, hence the age of each month was fixed. The odd months (Muharram, Rabiul Awal, Jumadil Awal, Rajab, Ramadan, Zulkaidah) are 30 days. In contrast, the even months (Safar, Rabiul Akhir, Jumadil Akhir, Syakban, Shawwal, Zulhijah) are 29 days, except for Zulhijah on A "jump year" (leap year), which is 30. The Urfi calendar compiled by Haji Abdul Lathif Tambi al-Malakawi refers to the manuscript "Mengenal Permulaan Tiap-tiap Bulan Bagi Tiap-tiap tahun Basithah dan Kabisat" (Knowing the Beginning of Each Month for Each Basithah and Leap year). According to Baharrudin Zainal, this manuscript is stored in the Malaysian Archives. The system used in compiling is

[40] Jakim, "JAKIM's Function," 2020, https://www.islam.gov.my/en/corporate-info/jakim-s-function.

[41] Aizan Ali Mat Zin, *Sejarah Astronomi Islam Di Malaysia*, *(No Title)* (Kuala Lumpur: University Malaya, 2017).

[42] Jabatan Kemajuan Islam Malaysia, "Pelaksanaan Ibadah Di International Space, ISS (Stesen Angkasa Antarbangsa)," 2007, https://www.islam.gov.my/images/garis-panduan/Buku-Garis-Panduan-Perlaksanaan-Ibadah-Di-ISS.pdf.

[43] Zainal, *Ilmu Falak: Teori, Praktek, Dan Hitungan*.

similar to the Urfi calendar, especially for determining the beginning of Ramadan and Shawwal by holding on to the rukyatul hilal.[44]

Comparison of the Beginning of the Lunar Month in 1441 Source:[45]

No	Month	Calendar/Almanac		
		Al-Fatdany	Abdul Latif	DIDM
1	Muharam	Sunday	Monday	Sunday, Sept 1, 2019
2	Safar	Tuesday	Wednesday	Monday, Sept 30, 2019
3	Rabiul awal	Wednesday	Thursday	Tuesday, Oct 29, 2019
4	Rabiul akhir	Friday	Saturday	Thursday, Nov 28, 2019
5	Jumadil awal	Saturday	Sunday	Saturday, Dec 28, 2019
6	Jumadil akhir	Monday	Tuesday	Sunday, Jan 26, 2020
7	Rajab	Tuesday	Wednesday	Tuesday, Feb 25, 2020
8	Syakban	Thursday	Friday	Thursday, Mar 26, 2020
9	Ramadan	Friday	Saturday	Friday, Apr 24, 2020
10	Shawwal	Sunday	Monday	Sunday, May 24, 2020
11	Zulkaidah	Monday	Tuesday	Tuesday, Jun 23, 2020
12	Zulhijah	Wednesday	Thursday	Wednesday, Jul 22, 2020

Even though MABIMS hilal visibility theory has been entirely accepted and used as a guide in making Islamic Almanacs in Malaysia, it needs to be reviewed according to the times' demands and the scientific development and technology. This awareness is continued through collaboration with various parties. In 2005, DIDM collaborated with the Universiti Malaya and the Mufti Negeri Sembilan to conduct joint and continuous observations. According to Mohd Saiful Anwar, the collaboration lasted for 20 years to perform observations at the beginning of the lunar month in the Teluk Kemang Negeri Sembilan Observatory (Nawawi, 2019). This was intended to analyze and improve the criteria for the hilal visibility. The twelve-year observations showed that the criteria for the MABIMS hilal visibility need to be improved.[46]

[44] Zainal.

[45] Zainal.

[46] Tim Editor, *Koleksi Kertas Kerja Seminar Persatuan Falak Syar'ie Malaysia (1406 H/1986 M-1425 H/2004)*, 1st ed. (Kuala Lumpur: Persatuan Falak Syarie Malaysia, 2007).

The DIDM team, led by Zambri Zainuddin, proposed the improvement of the MABIMS hilal visibility to 3° of the altitude and 5° of curvature of the moon to the sun.

The above proposal was reviewed by DIDM and discussed in the 16th "Muzakarah Rukyat and Islamic Calendar MABIMS Member States" on 2-4 August 2016 at the Baitul Hilal Port Dickson Complex, Negeri Sembilan Malaysia. In this meeting, Indonesia proposed that the hilal altitude be around 4° and the elongation be 5° besides the proposal from Malaysia, as conveyed by Ismail Fahmi (This proposal does not have a solid epistemological basis because it has not been agreed upon in the Hisab Rukyat Team of the Indonesia Ministry of Religion. Before being presented in the muzakarah forum, the selected criteria should be discussed comprehensively therefore can be accepted by all parties and will facilitate the process of unifying the Islamic calendar in Indonesia). Considering the developing view, the MABIMS hilal visibility criteria need to be improved according to the demands of syar'i and science. Finally, the MABIMS hilal neo-visibility was determined at a hilal altitude of 3° and an elongation of 6.4°. According to Zambri Zainuddin, the height of 3° refers to observations in Malaysia and Indonesia, while the elongation of 6.4° refers to international data used by Mohammad Syawkat Audah (Zainuddin, 2019). This decision was planned to make Islamic takwim in 1439/2018. However, it was only implemented in 1443/2021 after the Ministers' approval for Religious members of MABIMS.

Before the new criteria were implemented, DIDM continued to study through various meetings involving astronomy experts and employees in the Mufti Office. For Saiful Anwar to change the MABIMS criteria, various stages are still needed. The new criteria can be accepted and implemented by MABIMS members (Nawawi, 2019). Furthermore, changing the criteria is an initial discourse that needs to be followed up with various studies. Therefore, DIDM planned to invite experts from MABIMS members to rediscuss the data and systems used in making Islamic calendars in their respective states (Radzali, 2019). In the global issues discussed, DIDM was also actively involved by sending delegates to attend international meetings, such as "The Preparation Meeting for International Crescent Observation Conference" on 18-19 February 2013/8-9 Rabiul Akhir 1434 in Istanbul, Turkey. It discussed the problems faced around reckoning and rukyat as an effort towards the unification of the Islamic calendar on 28-30 May, 2016/ 21-23 Syakban 1437 in Istanbul, Turkey. Around 200 participants from various states attended the conference.[47] One was Sheikh Yusuf al-

[47] Azhari, Zainal, and Abdul Rashid, *Penyatuan Kalender Islam Dari Solidaritas Individual-Sektarian Menuju Solidaritas Kebangsaan-Keumatan*.

Qaradlawi, Chairman of the International Union for Muslim Scholars. On this occasion, the different parties were urged to realize an established Islamic calendar, where Muslims could fast and celebrate holidays on the same day. It was hoped that the present astronomers could help sharia experts unite Muslims by realizing an established Islamic calendar.

In the 2016/1437 Turkish conference above, the Scientific Committee proposed two concepts of the Islamic calendar reviewed by the Scientific Committee, namely the Bizonal and the Integrated Islamic Calendars. Nidhal Guessoum and Mohammad Syawkat Odeh initiated the Bizonal Islamic Calendar. The principles were (a) the world is divided into two zones, namely the western and the eastern, (b) the lunar month begins on the following day when the conjunction (*tawalludul hilal*) occurs before dawn in Mecca, and (c) the lunar month begins the next day in the western zone and is delayed a day in the eastern zone when conjunctions occur between dawn in Mecca and 12.00 UT. Meanwhile, the Integrated Islamic Calendar was initiated by Jamaluddin Abdul Razik with three principles, including reckoning, transfer of *rukyat*, and the determination of the beginning of the day [48]. Participants who wish to express their views are limited, and the issues raised are still "elementary" in nature and have not studied the two concepts substantively. Consequently, there is "dominance" in realizing a global Islamic calendar. This is evidenced by decision-making through voting, where one hundred and thirty participants can express these rights. The result was eighty and thirty votes for the unified and *bizonal* Islamic calendars, and the remaining were broken and abstained.

For Malaysia, the decision of the 2016/1437 Turkish conference is an issue that continues to be discussed. According to Saiful, in response to the results of the Turkey 1437/2016 conference on the global Islamic calendar, DIDM held a meeting with the astronomy team and astronomers in the Mufti Office through *muzakarah* (Nawawi, 2019). Baharrudin Zainal stated that the global Islamic calendar resulting from the Turkey 1437/2016 conference is only an initial idea (Zainal, 2019). However, when most Islamic states accept, then Malaysia will also follow suit. The views above illustrate that Malaysia is more adaptive in accepting changes according to the demands of the times. Referring to Mu'tamar Tatsbit Awa'il ash-Syuhur al-Qamariah in Istanbul, Turkey on 26-29 Zulhijah 1398/27-30 November 1978, Malaysia was the only state in the ASEAN Region that agreed on the criteria in the making of the Islamic calendar.

[48] Jamaluddin 'Abd Ar-Raziq, *At-Taqwim Al-Qamari Al-Islamiy Al-Muwahhad,* (Rabat: Marsam, 2004).

E. Conclusion

The Islamic calendar system has developed according to the demands of the times. The first period (before 1969-1986) used the *Istilahi* calendar based on urfi reckoning. However, in determining the beginning of Ramadan and Shawwal, it needs to wait for the results of observations. In this period, astronomers from each state compiled the Islamic calendar based on different theories. The second period (1986-1991) used the Ijtimak Hakiki Calendar. The new date begins when the *ijtimak* event occurs before sunset. This theory was used to determine all the beginnings of the lunar month except Ramadan and Shawwal using the hilal visibility from the 1978 Istanbul-Turkey conference, adapted to Malaysian conditions as in the previous period. Therefore, the specified conditions are used alternatively, not cumulatively. The third period (1992-1994) used the *ijtimak* Wujudul Hilal calendar. In this calendar, a new date is considered to start when there has been *ijtimak* before and after sunset. This theory was used for all lunar months except Ramadan and Shawwal. The use of this calendar system only lasted for two years. The fourth period runs from 1995 to 2021 using the *Imkanur Rukyat* or "Takwim Rukyat" calendar. In practice, the *Imkanur Rukyat* used was the MABIMS *imkanur rukyat* (2,3,8). According to the duties and functions, DIDIM has a very strategic role in unifying the Islamic calendar in Malaysia. Even though MABIMS hilal visibility theory has been entirely accepted and used as a guide in making Islamic Almanacs, it needs to be reviewed according to the times' demands, scientific development, and technology. This awareness is continued through collaboration with various parties domestically and abroad. In the fifth period since 1 Muharram 1443 H/2021, Malaysia uses a new criterion to determine the lunar month's beginning, namely the MABIMS Hilal Neo-Visibility (3,6.4). Main efforts to unify the Islamic calendar in Malaysia are made by publishing the Hijri Almanac based on the MABIMS hilal visibility theory, which is used as an administrative and worship reference. The hilal observations are still carried out, and can change the dates in the almanac, as happened in the determination of beginning of Shawwal 1443 H/2022.

F. Conflict of Interest Statement

The authors declare that this study was conducted without any conflicts of interest, whether financial or non-financial. This study was conducted independently for academic purposes and did not receive funding from any party that could influence the study's results.

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