

Bibliometric Analysis of Publication Paper Themes for Hajj Services over the Period of COVID-19 Pandemic

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Abstract

The expansion of the literature is necessary. A significance of the framework of the current condition of Hajj service development is required. This study aims to provide an overview of the publication activities and trend of research in relation to Hajj services using bibliometric analysis. The method in this research used descriptive statistical tools with meta-analysis employing bibliometric analysis of secondary data from 142 papers published during the period of the COVID-19 pandemic, from 2019 to 2022. The development trends of hajj service publications were also evaluated using the VOSviewer program. This study found that the number of research publications on the Hajj services has increased in the last four years (2019-2022) indicating that themes regarding Hajj services show uptrend patterns. These seem to lead scholars to provide contributions to the body of knowledge. In addition, the interest of scholars has been shifting toward topics related to digitalization systems.

Keywords: Hajj, Bibliometric, VOSviewer

INTRODUCTION

Hajj is an annual Islamic pilgrimage to Mecca, Saudi Arabia, and is one of the Five Pillars of Islam (Rahman et al., 2017; Taibah et al., 2018). It is a mandatory religious duty for Muslims that must be carried out at least once in their lifetime by all adult Muslims who are physically and financially capable of undertaking the journey, and of supporting their family during their absence from home. The Hajj is a spiritual, emotional, and physical challenge that tests the patience and temperament of the pilgrim

فِيهِ آيَاتٌ بَيِّنَاتٌ مَّقَامُ إِبْرَاهِيمَ ۖ وَمَنْ دَخَلَهُ كَانَ آمِنًا ۗ وَلِلَّهِ عَلَى النَّاسِ حِجُّ الْبَيْتِ مَنِ اسْتَطَاعَ إِلَيْهِ سَبِيلًا
وَمَنْ كَفَرَ فَإِنَّ اللَّهَ غَنِيٌّ عَنِ الْعَالَمِينَ

"In it are clear signs [such as] the standing place of Abraham. And whoever enters it shall be safe. And [due] to Allah from the people is a pilgrimage to the House - for whoever is able to find thereto a way. But whoever disbelieves - then indeed, Allah is free from need of the worlds" (QS 3:97).

Hajj is also known as a collective act of submission. Those who are able must respond to the Lord's call. This devotional act is not a community obligation, but it is a personal obligation (for every individual who possesses the ability and means to complete the journey successfully. The pilgrimage is considered a worldwide gathering since it brings together all Muslims capable of praying to visit holy sites in and around Makkah (Alharthi & Gutub, 2017; Alnabulsi et al., 2018; Fathurrahman et al., 2021; Hussain et al., 2021). Around two million Muslims from more than 180 countries travel to the Holy city of Mecca in Saudi Arabia each year, as pilgrimage is one of Islam's commandments and must be carried out if one possesses the physical, financial, and time capabilities (Alaska et al., 2017; Felemban et al., 2020). As implied in Hoang et al. (2020), the pilgrimage must be made at least once in a lifetime and is an obligation for all Muslims who have reached puberty and possess the physical and financial means to do so. This rite is observed in the 12th month (Zulhijjah, the month of Hajj).

The Hajj's activities are now characterized as when Muslims arrive in Mecca. The pilgrimage begins on the first day at the Grand Mosque with the Tawaf ceremony, which revolves seven times around the centre structure (Kaaba). The Kaaba, or "house," as the scriptures frequently refer to it, is nothing more than Abraham and Ishmael's role in its building. The Book of Allah, on the other hand, elevated it to a significant position in the emerging Islamic worship, both as a permanent focal point for specific rites, such as the long-established circling of Mecca, and as a qibla, or focal point, from which every Muslim would turn to a new location. Islam prescribes liturgical prayers (Peters, 1995). Two minor hills located east of the Kaaba have now vanished beneath the flat geography of modern Mecca. The southern one is named Safa, and the northern one is called Marwa, and it is between them that one of the ritual acts connected with Mecca's religious life takes place. A different type of circling between two points had somewhat to do with running and was later called "running" known as "Sai." Afterward, the practice is incorporated into the Umrah and Hajj. At the same time, the pilgrim makes an animal sacrifice (camel, cow, or sheep). Pilgrims stay in Mina on the fourth and fifth days. On the fifth day, they travelled from Mina to Mecca, performed the final farewell rite for Tawaf and Sai, and then left Mecca (Aldossari et al., 2019).

The practice of pilgrimage in Indonesia has increased over the year. So far, public interest in performing the pilgrimage has improved in quantity. This is demonstrated by the fact that the number of departure quotas available each year is less than the number of pilgrims who register. However, due to the global spread of the Covid-19 virus, Saudi Arabia announced on June 22th, 2020, the entry of overseas pilgrims and domestic citizens 65 years and older with chronic illnesses to conduct the pilgrimage (Ebrahim & Memish, 2020; Gautret et al., 2020; Rahman et al., 2021). This restriction was implemented due to the high financial support among pilgrims in Makkah (Alqahtani et al., 2019; Alrefaei et al., 2022).

COVID-19 is not the first time a lethal virus has spread rapidly around the planet. World Health Organization (WHO) declared a Public Health Emergency of International Concern (PHEIC) in January 2020, designating Covid-19 as a global epidemic. This pandemic affects individual lives and entire economies and nations, notably Saudi Arabia, hosting the world's largest annual mass gathering. Due to the quick spread of the deadly infection within the society, the authorities responded to the catastrophic situation by limiting the Hajj journey to 1000 residents of the Kingdom, down from 2.5 million the previous year (Hassounah et al., 2020; Islam et al., 2021; Jokhdar et al., 2021).

On March 2, 2020, the first COVID-19 case was reported in Saudi Arabia. Since then, nearly 428,369 cases have been reported. By May 2021, approximately 412,102 people had recovered from the disease, with nearly 7098 deaths. Since the beginning of the rise in reported cases, the Saudi Ministry of Health (MOH) has launched numerous awareness campaigns about the virus's nature, transmission routes, and preventative measures, as well as daily updates. The Saudi government has also taken strict measures to control the virus's spread, such as limiting social activities. (Alrefaei et al., 2022). Furthermore, to prevent disease spread, a multidisciplinary Saudi team from the public and private sectors, including the Global Centre for Mass Gatherings Medicine, collaborated on the assessment, planning, implementation, and success of this holy event. There were no confirmed cases of COVID-19 among pilgrims, healthcare personnel, or nonmedical employees assisting with the rituals during or after the Hajj (Khan et al., 2021; Zumla et al., 2020). WHO applauded Saudi Arabia's move to safeguard pilgrims' health and safety and bolster regional and global health security.

At the moment, the Hajj pilgrimage will continue regardless of quota limits. Saudi Arabia's government has formally announced that the 2021 Hajj pilgrimage will occur. Even with a restricted number of quotas and age and health limitations on prospective Hajj pilgrims. Thus, it was determined that numerous challenges faced Hajj services during COVID-19, including health services, counselling for Hajj rituals, digitization, etc. The future pilgrimage might be organized the same way as the Hajj in 2020. Even the WHO commended Saudi Arabia's efforts to ensure pilgrims' health and safety and regional and global health security due to the absence of Covid-19 hajj cases in 2020.

As stated in Aldossari et al. (2019), health authorities in the countries of origin must warn Hajj pilgrims about potential health risks and advise them to avoid them. Pilgrims, for example infectious disease symptoms, complications, and preventive measures. Furthermore, the Ministry of Health (MOH) has conducted several public awareness campaigns and provided free COVID-19 immunizations. (Alrefaei et al., 2022). Finally, Hajj's triumph in 2020 in the midst of the COVID-19 epidemic serves as a warning to all global organizations. It demonstrates how to plan, execute, and manage influential mass gathering events through the use of technology and concepts such as safe bubbles, tracks, and appointed health officers, as well as other established preventative measures. (Jokhdar et al., 2021).

Technology and digital technologies have facilitated the provision of essential services after introducing these stringent mitigation measures (Hassounah et al., 2020). Efforts are being made to enhance Hajj services continuously. During the COVID-19 epidemic, Saudi Arabia extensively used digital technology in public health, healthcare, and risk communication (Alzhrani & Almalki, 2021). The Saudi government provides free medical care to all pilgrims. Covid-19 puts undue strain on healthcare systems. Healthcare institutions with larger health innovation infrastructures faced fewer challenges and were able to control Covid-19. Digital technology has been critical in Saudi Arabia's fight against SARS-CoV-2 transmission. (Alghamdi et al., 2021).

This current technological adoption is part of the Saudi Arabian Kingdom's vision of 2030, which emphasizes the importance of smart systems, artificial intelligence, and the internet of things as primary contributors to all critical Hajj and Umrah sectors (Shambour & Gutub, 2021).

Some programs have been developed to assist pilgrims in performing rituals, navigation, translation, Qibla direction, prayer times, weather, money conversion, and points of interest (Felemban et al., 2020). Nowadays, technology plays a more significant role in enhancing service quality. Mobile applications (apps) are a class of technologies that

enable the provision of various services. Numerous organizations and individuals have developed various Islamic applications for use on mobile devices to aid worshipers in praying peacefully. New services will be developed to capitalize on technological and service sector advancements each year. One of the emerging technologies is software applications, colloquially referred to as "applications," for mobile devices. Hundreds of apps for the iPhone and Android platforms are available to assist anyone intending to undertake Hajj or Umrah. To optimize the benefits of these applications, they should be investigated and evaluated using particular criteria (Khan & Shambour, 2018)

Many applications have been found to support and improve efficiency in Hajj services, especially since Covid-19, both from health services, administration, and others. According to Latif et al. (2016), a technology plays a critical role in enhancing health services. Each year, millions of Muslims come to Saudi Arabia to perform pilgrimage ceremonies. Pilgrims may require healthcare services, which must be provided precisely and in real-time, which requires technological techniques based on prior health information. This study aims to determine the value and viability of IoT implementations for pilgrims' HER retrieval via electronic tags. Another study implied in Hassounah et al. (2020), contact tracing is a critical epidemiological technique for limiting the COVID-19 outbreak and enforcing safe-lifting lockdown plans. The Saudi Data and Artificial Intelligence Authority (SDAIA) accomplished this by releasing two smartphone apps. The first application is Tawakkalna, which is a GPS-enabled app that monitors and restricts persons' movement during curfew hours and allows for exceptions. The second application is Tabaud, which translates as "Distancing," gives deidentified data to individuals who have had close contact with verified COVID-19 cases.

Additionally, as part of their research, Shobri et al. (2020) developed a smart tracking prototype and a health monitoring system for Hajj and Umrah travelers. The prototype is built around the TTGO T-watch, equipped with a GSM or GPS module and a pulse sensor. The technology takes data from the GPS module and pulse sensor on the pilgrims' watches to establish their location (longitude and latitude) and heart rate. The data from the watch is transferred to the Blynk server and subsequently shown in the Blynk-powered application 'iTrack.' It will display the pilgrims' current location and heart rate in real-time. In this way, a smart tracking prototype and a health monitoring system can help reduce the number of pilgrims who go missing and assist pilgrims in remaining more focused on their ritual activity with fewer worries.

Islam et al. (2021) disclosed that advancements in digital technology in the health sector, massive data, and artificial intelligence (AI) have aided and facilitated several governments throughout the world in their efforts to contain the spread of lethal Covid-19 infections. Research on Saudi Arabia's digital health legislation and regulations from 2021 recommends various mobile health applications for the KSA. Leading authorities, such as the Ministry of Health, design these applications.

Indonesia the Ministry of Religious Affairs of Indonesia is attempting to adapt to the Saudi Arabian government's digitalization agenda in all sectors, including the Hajj sector. One of these is with the launch of the Hajj Smart Card. This is one of the Saudi Arabian Government's digitalization initiatives. It will serve as a model for the Ministry of Religion's Directorate General of Hajj and Umrah (Ditjen PHU) to implement similar innovations to improve future Hajj services. Additionally, the application named Siskohat is the first Hajj service innovation and is constantly being developed to improve Hajj services. Along with mobile car services, Siskohat has created an e-registration method (the electronic registration of regular hajj pilgrims) using the Haji Smart application on their particular smartphones. In general, the registration process followed by Hajj pilgrims thus far consists of two (two) steps: the first deposit at the Recipient Bank for Hajj Travel Expenses Deposits (BPS-Bipih) and the part issuing at the Regency/City Ministry of Religion. This second stage is now underway). become the primary focus of the development of digitized services for Siskohat Hajj pilgrims (Kemenag, 2021). The presence of digitalization in Hajj services is hoped to benefit Hajj pilgrims and increase Hajj service efficiency.

Various literatures on the subject of Hajj service have been conducted. However, research on the growth of the literature is also necessary. The advancement of literature is a challenge in the context of the present state of Hajj service development. The evolution

of practice has not been paralleled by the growth of the available literature (Siddiq, 2018). There has been no research to date that attempts to conduct a full review and evaluation of the literature on Hajj service, mainly through bibliometric analysis. This study will employ a bibliometric analysis of the hajj service literature to address this gap.

To accomplish this purpose, this study focuses on identifying the most influential features of Hajj service, visualizing the bibliographic network, and making some recommendations for future research. We visualize the trend toward Hajj service literature using bibliometric analysis this study contributes to a new practical research direction that is critical to consider for improving Hajj services and Umrah with today's technology. The finding of this study is the first design to show trends and project future developments of Hajj research activity.

METHOD

This study draws on data from study journals and other study articles published on Hajj Service over the last four years, as well as metadata from the Dimensions database (<https://www.dimensions.ai/>). From 2019 to 2022, the data were gathered using the keywords hajj service in conjunction with the article title and abstract categories. As a result, there were 142 publications on February 27, 2022. The approach used in this study is qualitative, with a descriptive statistical method. Related to hajj services, the data were analyzed using Microsoft Excel 2016. Meanwhile, the development trends of hajj service publications were evaluated using the VOSviewer program.

VOSviewer is developed to create and view bibliometric maps and is freely available to the bibliometric research community. This tool provides the reader with a map that allows for a comprehensive examination of bibliometrics (Abbas & Abdulrahman, 2023). VOSviewer can create authorship and keyword maps from shared incident data based on co-authorship information and co-occurring keywords.

VOSviewer can display maps created with appropriate mapping techniques. VOSviewer makes use of the VOS mapping technique (Eck & Waltman 2009), where VOS stands for visualizing similarity. As a result, this application can display maps generated using VOS mapping techniques as well as maps generated using multidimensional scaling techniques. VOSviewer works with a variety of hardware and operating systems and can be launched directly from the internet.

RESULTS AND DISCUSSION

Results of Data Description

This section discusses papers that have been published with the theme of Hajj Service. As a result, there were 142 papers published in a four-year observation period from 2019 to 2022. Table 1 presents the distribution of papers per year, which varies over the last 4 years, ranging from 5 to 52 papers. The highest number of papers was published in 2020 with 52 papers (37%) and the least, 5 papers published in 2022.

Table 1. Publication per year

Year	Number of Papers
2019	36
2020	52
2021	49
2022	5
Total	142

Based on Table 1 and Figure 1 respectively, there was an overall increase in the number of papers published by various journals with the theme of Hajj Service. From 2015 to 2021, there will be an escalating increase. This means that the theme of Hajj Service is getting more interesting to study along with the development of Hajj. Meanwhile, for 2022,

there are five papers because the number of papers does not cover the entirety, considering that data collection for this research was carried out on February 27, 2022.

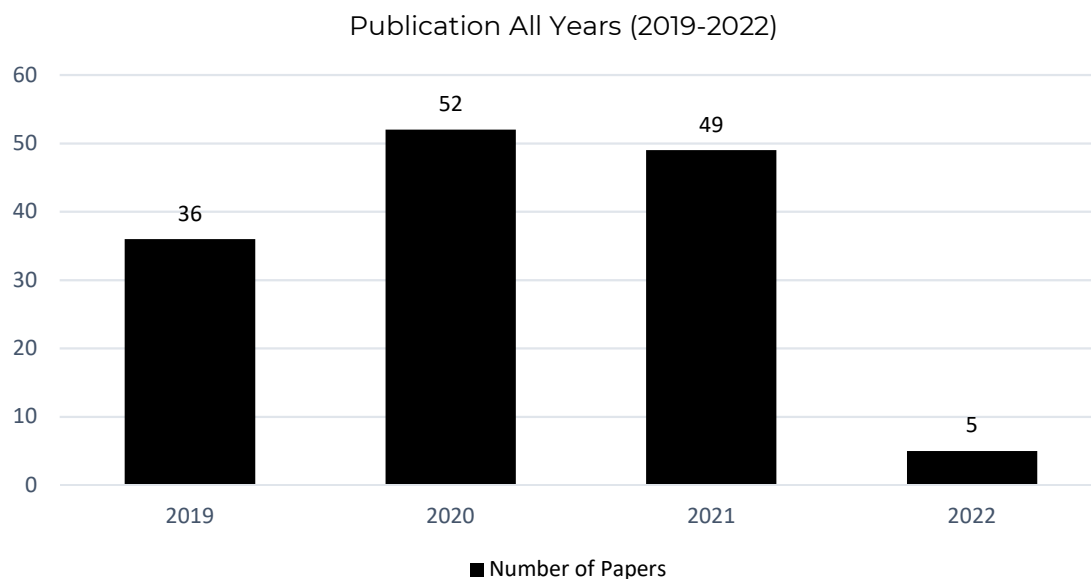


Figure 1. Publication per year

From 142 papers published with the theme of Hajj pilgrimage in the last 4 years, the title of the most widely cited extensive paper is 'Health issues in the Hajj pilgrimage: a literature review.' This study provides recommendations on health policies to prevent health risks. The results of this study indicate the need for health management and Hajj services in three main categories, namely communicable diseases, non-communicable diseases, and health services.

Table 2. Top Five Authors

No.	Authors	Number of Paper
1	Yousef Ahmed Alomi	8
2	Yasir Abdulraheem Bamagaus	8
3	Nezar Adnan Yahya Khayat	8
4	Anas A Khan	4
5	Moh'D Khaled Yousef Shambour	3

Table 2 shows the five most prolific authors of papers published with the theme of Hajj Service in the last 4 years. As the table shows, the three authors each wrote eight papers published on the theme of Hajj Service.

Table 3. Top 10 Citations

Citations	Title	Author
13	Health issues in the Hajj pilgrimage: a literature review.	Mae Aldossari, Abdullah Aljoudi, David Celentano (2019)
13	Saudi Hajj pilgrims' preparation and uptake of health preventive measures during Hajj 2017	Amani S Alqahtani, Nora A Althimiri, Nasser F BinDhim (2019)
10	Digital Revolution for Hajj Crowd Management: A Technology Survey	Emad A. Felemban, Faizan Ur Rehman, Sardar Asad Ali Biabani, Akhlaq Ahmad, Atif Naseer, et al (2020)
7	Future Heat Stress During Muslim Pilgrimage (Hajj) Projected to Exceed "Extreme Danger" Levels	Suchul Kang, Jeremy S. Pal, Elfatih A.B. Eltahir (2019)

6	Prevalence of Diabetes and Hypertension among Hajj Pilgrims: A Systematic Review	Saber Yezli, Abdulaziz Mushi, Yasir Almuzaini, Bander Balkhi, Yara Yassin, Anas Khan (2021)
5	Progress of IoT Research Technologies and Applications Serving Hajj and Umrah	Mohd Khaled Shambour, Adnan Gutub (2021)
5	COVID-19 in Saudi Arabia: the national health response	Anas Khan, Yousef Alsofayan, Ahmed Alahmari, Jalal Alowais, Abdullah Algwizani, et al (2021)
5	Personal Privacy Evaluation of Smart Devices Applications Serving Hajj and Umrah Rituals	Mohd Khaled Shambour, Adnan Gutub (2021)
5	Smart city planning and sustainable development	Ali Abdulsamea Hameed Nidal Nasser, Ahmed el
4	Crowd Management Services in Hajj: A Mean-Field Game Theory Approach	Quadrhiri, Mohamed el Kamili, Asmaa Ali, Muhammad Anan (2019)

Table 3 shows the top 10 papers ranked by total citations from the time of publication to when this research was conducted on February 27, 2022, out of 142 papers published with the theme of hajj service in the last 4 years from 2019 to 2022. The highest-ranking, with 13 citations, is a paper written by Aldossari et al. (2019) with the title 'Health issues in the Hajj pilgrimage: a literature review.' Then in second place with a total of 13 citations written by Alqahtani et al. (2019) with a paper entitled 'Saudi Hajj pilgrims' preparation and uptake of health preventive measures during Hajj 2017'. Meanwhile, in third place, with citations of 10, is a paper written by Felemban et al. (2020) titled 'Digital Revolution for Hajj Crowd Management: A Technology Survey.' From this explanation, it can be concluded that the writings that refer to Hajj service are interesting to explore as seen from previous works that have been widely cited in recent studies and the development of the topic more deeply.

Bibliometric Analysis of Co-authorship Author

After using the VOSviewer software, we discovered the author's bibliometrics, as seen in Figure 2.

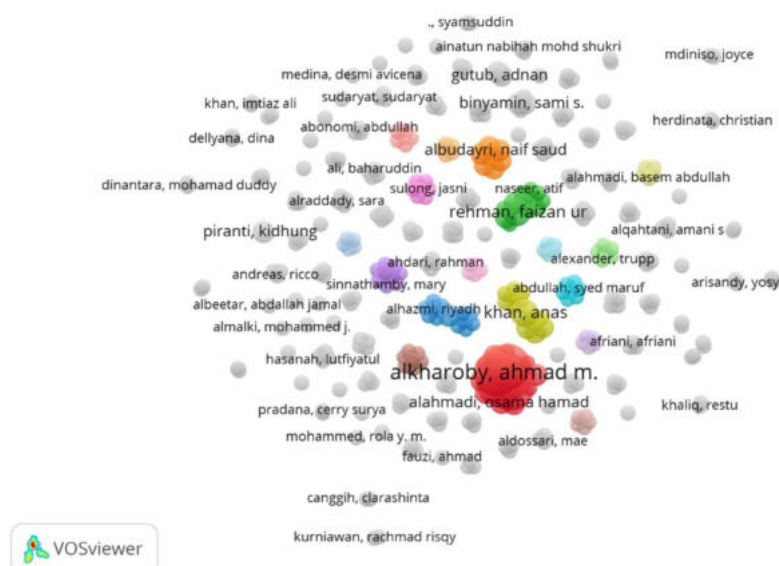


Figure 2. Network Visualization

Co-authorship analysis is a type of analysis that examines the links between items based on the number of documents co-authored by the authors. The authors' unit of analysis is one sort of co-authorship. The program will next analyze the full body of literature to identify a cluster of writers who have written papers on the subject of Hajj Service.

As a consequence of the software processing, the author's name will be shown in a colored circle according to the kind of co-author, a technique known as network visualization. Authors who are linked to one another are highlighted in the same color and separated by a line. The presence of their names in the cluster indicates that they cooperated on their research. The diameter of the circle also represents the number of publications by the writers. The larger the circle, the more publications the author has.

According to the image above, the findings indicate that when the literature is categorized by author's name in a research themed hajj service, the resultant cluster looks like this. Additionally, the image demonstrates the author's engagement in creating a diary on the subject of Hajj Service. There are 379 writers classified into 123 clusters of similar authors, each of which is highlighted in the same color and separated by tiny lines. Clusters of red, green, blue, yellow, brown, purple, and orange are among them. Meanwhile, some writers mentioned in gray circles and not related with other circles did investigations alone and without co-authors. According to the given findings, the red cluster has the most authors (16), including Nouf Hameed, Osama Hamad, Naif Olaythah, Fared Ali, Mesfer, Ahmad M., Majed Mohammad, Yousef Ahmed, Yasir Abdulraheem, Lamees Essa, Hani Mohammad, Nezar Adnan, Nojoud Adnan, and Wael H.

Alomi et al. (2020) published a study named 'National Mass Gathering Pharmaceutical Care Program in Saudi Arabian Healthcare Institutions'. The paper addresses pharmaceutical care services provided by health organizations in Saudi Arabia during mass pilgrimage (MG) pilgrimages (SA). According to the study's findings, the MG pharmaceutical care program is a relatively recent initiative launched by health organizations in the past four years that offers pharmaceutical care services in a variety of disciplines.

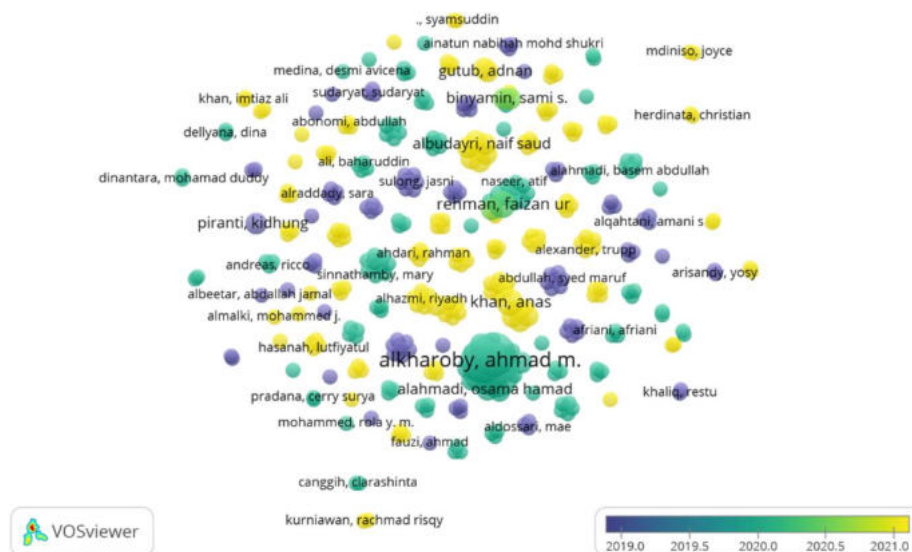


Figure 3. Overlay Visualization

Following that is the kind of overlay visualization in the co-authorship figure, which places the image inside a certain frame (either a circle or a rectangle) and colours it according to the year of publication, rather than the cluster. The colour division in the overlay representation is modified according to the publishing year, with deeper colours representing a longer publication year and lighter colours representing a shorter publication year. While the size is changed in accordance with the frequency of occurrences in the literature.

Hidayat et al. (2019) published the first article on hajj service in their paper titled 'Implementation of RFID as tracking for hajj pilgrims linked to GPS (IM RFID SECURE GPS)'. The identifying mechanism and the location of the carrier model ID card are discussed in this research. A unique number is employed as an identification since RFID tags and readers operate on the basis of radio waves. This approach makes use of technology that

anticipates pilgrim loss. Additionally, the more attentive you are, the deeper the amount of study on the subject of Hajj Service. This is shown by the growing number of new authors who publish studies on the Hajj service. A study titled 'Progress of IoT Research Technologies and Applications Serving Hajj and Umrah' by Shambour & Gutub (2022) is an example. The purpose of this research is to emphasize the critical nature of integrating and adapting technology in order to better serve Hajj and Umrah travelers. The findings of this study pave the way for future research into practical directions determined by a comprehensive analysis of the present technology analytical survey, which is important to consider when it comes to upgrading Hajj and Umrah services using existing technology.

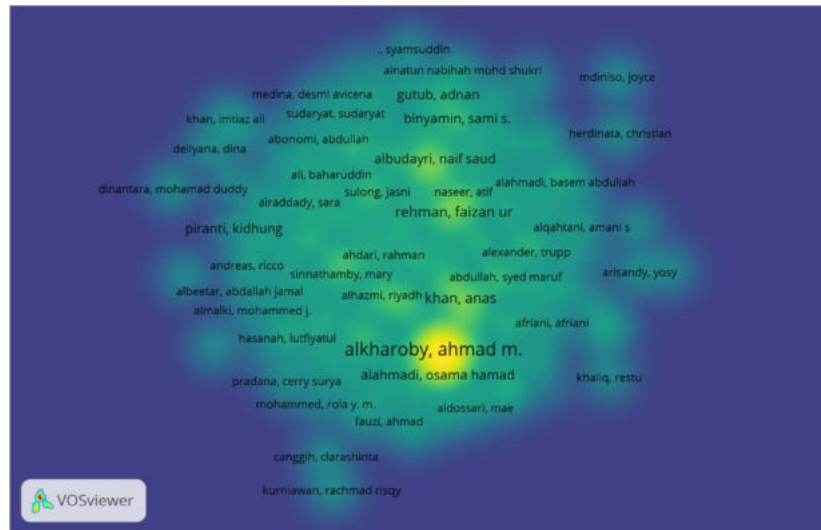


Figure 4. Density Visualization

The VOSviewer program may also display a co-authorship bibliometric map based on density visualization based on the findings presented in this co-authorship picture. As with network and overlay visualizations, things are represented by their labels in item density visualization. Each point in the depiction of item density has a colour that corresponds to the item density at that position. Colours vary in temperament from blue to green to yellow. When there are more objects around a point, the weight of the connection between the items increases, and the colour tends to be yellow. On the other hand, the fewer objects around the point, the lighter the weight of the association between the items, and the dots tend to be blue in colour.

Bibliometric of Co-occurrence

The image below illustrates the visual mapping of a paper published on the subject of Hajj Service. The findings of the keyword mapping study serve as the foundation for mapping the co-occurrence of significant or unique phrases found in specific articles. Figure 5 illustrates the outcomes of the visualization of the co-word map network for the purpose of publishing the Hajj service themed paper.

The following are the 50 keywords that often occur in the Hajj service focused document issued on February 27, 2022 and are grouped into six clusters:

- 1) Cluster 1 in red consists of 12 keywords, namely: *bpkh, effectiveness, fund, hajj fund, hajj pilgrimage, hajj service, indonesia, lack, ministry, prospective pilgrim, religion, siskohat*
- 2) Cluster 2 in green consists of 11 keywords, namely: *goal, Kingdom, mass, mass gathering, monitoring, new initiative, new initiative project, part, project, saudi arabia, vision*
- 3) Cluster 3 in blue consists of 9 keywords, namely: *covid, education, framework, health service, knowledge, pandemic risk management, participant, researcher, response*
- 4) Cluster 4 in yellow consists of 9 keywords, namely: *application, customer, customer satisfaction, effect, increase, ramadhan, service quality, user, visit*

- 5) Cluster 5 in purple consists of 5 keywords, namely: *hospital, mission, nurse, patient, performance*
- 6) Cluster 6 in blue consists of 4 keywords, namely: *city, concept, development, smart city*

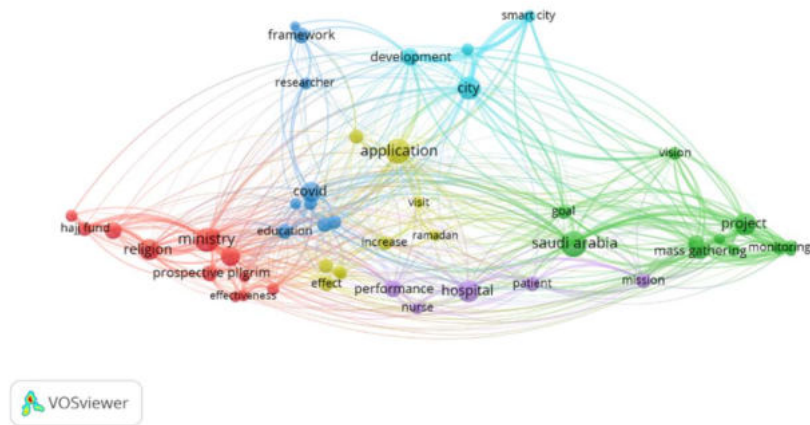


Figure 5. Co-Occurrence Network Visualization

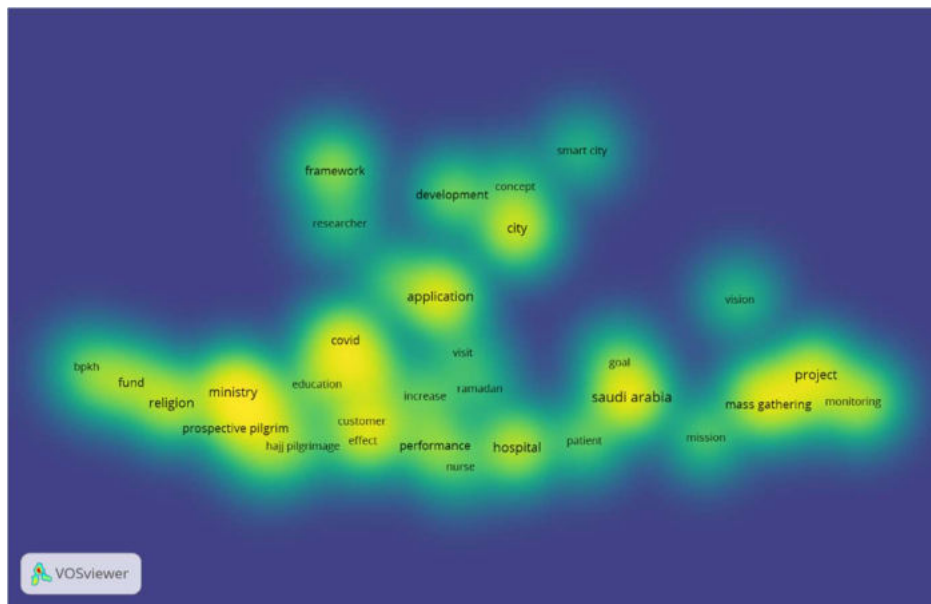


Figure 6. Co-Occurrence Density Visualization

In Figure 6, the VOSviewer programme can display a co-authorship bibliometric map based on density visualisation. Things in item density visualisation, like in network and overlay visualisations, are represented by their labels. The density of items at each point in the item density visualisation is indicated by the colour of the point. The temperament of colours ranges from blue to green to yellow. When more objects surround a point, the weight of the connection between the items increases, and the colour tends to be yellow. The fewer objects around the point, on the other hand, the lighter the weight of the association between the items, and the dots tend to be blue in colour.

CONCLUSION

This study provides an overview of the meta-analysis of the trend toward increased Hajj service literature over the last four years, from 2019 to 2022. The number of research publications on the Hajj service has increased in the last four years, indicating that it is worthwhile to continue studying and developing. From a bibliometric standpoint, digitization of Hajj services benefits pilgrims and improves service efficiency. This study further obtains six clusters to map authorship, with the red cluster containing top authors including Nouf Hameed, Osama Hamad, Naif Olaythah, Fareed Ali, Messer, Ahmad M., Majed Mohammad, Yousef Ahmed, Yasir Abdulraheem, Lamees Essa, Hani Mohammad, Nezar Adnan, Nojoud Adnan, and Wael H.

The finding of this study can lead a new research direction in a practical way, which is chosen after a thorough review of the current technological analytic survey to improve Hajj and Umrah services by utilising cutting-edge technology. As a suggestion, to comply with the Saudi government's digitalization policy across all sectors, including Hajj, the Indonesia government must be innovative. In addition, the Hajj health services must be evaluated and suggestions for making improvement. Related to a limitation, the goal of this study is to provide an overview of research trends in the Hajj Service theme, the time span covered is only four years. While the study used specific bibliometric indicators to provide readers with a broad overview of the most important facts, the obtained results seem to be dynamic and subject to change over time. To provide more comprehensive results, future research should conduct a complete bibliometric analysis with additional study materials or various tools.

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