

Instagram Engagement Analysis of Special Hajj Organizers (PIHK) in West Java

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Abstract

The use of social media, particularly Instagram, has become a powerful tool for communication, networking, and business promotion. This study aims to analyze user engagement on the Instagram accounts of special Hajj pilgrimage organizers in West Java. Of the 29 PIHKs registered in West Java, 26 Instagram accounts were found and collected as data sources, 6 accounts were inactive within the period leaving 20 accounts as the final research sample, including metrics such as posts, likes, comments, and followers. The findings revealed positive correlations between comments-likes, comments-followers, likes-followers, and likes-posts. However, no statistically significant correlation was found between comments-posts and followers-posts. Interestingly, none of these variables showed a significant correlation with overall engagement rates. Among the 20 accounts examined, only two demonstrated high engagement rates, with values of 10.42 and 8.91 respectively; the remaining 18 had low engagement. The study concludes that comments are positively correlated with likes and followers, and likes are positively correlated with followers and posts. The research suggests that organizers should develop daily content strategies with optimal posting times and compelling copywriting to increase interaction. This study contributes to the growing body of knowledge on how social media impacts the organization and promotion of Hajj pilgrimage services.

Keywords: Comment; Digital Marketing; Engagement Rate; Instagram, Like

INTRODUCTION

In the wake of the COVID-19 pandemic, information technology has become indispensable across all aspects of life, including work, trade, and personal activities (Vioudita et al., 2022). The internet and social media are now integral to how people communicate, share, and conduct business. Social media platforms allow users to create, exchange, and interact with content in various formats (Sentoso et al., 2023), becoming vital tools for communication, social engagement, and business promotion (Lalangan, 2020).

As of January 2024, Indonesia had 139 million social media users, accounting for 49.9% of the population (We Are Social, 2025). WhatsApp leads usage at 90.9%, followed by Instagram (85.3%), Facebook (81.6%), TikTok (73.5%), Telegram (61.3%) and X (formerly Twitter) (57.5%). In addition, Facebook Messenger (47.9%), Pinterest (34.2%), Kuaisho (32.4%) and LinkedIn with the smallest proportion of users (25%) (Annur, 2023).

Digital marketing, including social media marketing, uses digital platforms to disseminate information and promote products to target audiences (Sentoso et al., 2023). For companies, especially MSMEs, Instagram enhances brand visibility and customer loyalty (Pranindya et al., 2019; Sudirjo et al., 2023). Instagram, an image-based platform, enables users to share photos and videos, use location tags, captions, and hashtags, and archive stories (Lalangan, 2020). Indonesia ranks fourth globally in Instagram usage, with 104.8 million users as of October 2023, behind India, the U.S., and Brazil. Men slightly outnumber women globally among Instagram users aged 18+ (Solekhan & Winarso, 2016). The rising number of users presents opportunities for leveraging Instagram in business marketing.

Studies have examined Instagram's role in MSMEs, including food and beverage (Rafiah & Kirana, 2019), Nasi Lemak food (Calvin et al., 2023), travel (Nirmala et al., 2021), hydroponics (Pravina et al., 2023), and hampers (Sentoso et al., 2023), as well as in governmental agencies (Arman & Sidik, 2019) and global brands (Tafesse & Wood, 2021).

The study by Rafiah & Kirana (2019) explains the adoption of social media by SMEs as a digital marketing tool that helps expand market reach. Research by Calvin et al. (2023) and Sentoso et al. (2023) confirms that the implementation of digital marketing can enhance the effectiveness of SME promotions. Meanwhile, Nirmala et al. (2021) examined the use of Instagram as a promotional medium for the tourism sector and demonstrated Instagram's role in increasing the visibility of services. The study by Pravina et al. (2023) examined the effectiveness of Instagram as a marketing communication medium using indicators of audience interaction and digital communication. More specifically, Tafesse & Wood (2021) identified that content strategies and interaction patterns influence audience engagement levels on Instagram, while Arman & Sidik (2019) developed the engagement rate metric as an indicator of Instagram account effectiveness.

Nevertheless, the research mentioned still has several limitations. First, most studies focus on the SME sector, commercial products, and general businesses. In this regard, similar studies on Hajj organizers remain relatively limited. Second, previous research tends to focus on the implementation of digital marketing in general without conducting an in-depth analysis of Instagram Insights data as a source for evaluating account performance.

In fact, Instagram Insights provides important data such as reach, impressions, engagement, audience demographics, and content performance, which can offer a more objective assessment of the effectiveness of marketing strategies. Third, existing research on social media in the travel sector has focused more on the general tourism sector than on religious travel services, particularly Special Hajj Organizers (PIHK). The conditions stated indicate a research gap, namely a lack of studies that integrate Instagram Insights analysis with the context of digital marketing in specialized Hajj service organizations. The characteristics of specialized Hajj service organizations

differ from those of other service sectors because consumer decisions are influenced by factors such as trust, reputation, credibility, and perceptions of service quality. Therefore, digital communication strategies for specialized Hajj service organizations require a different approach than that used in conventional businesses.

The travel and tourism industry is a service sector that has undergone significant transformation due to advancements in digital technology and changes in consumer behavior. Marketing activities in the travel sector no longer rely solely on conventional promotional media but are increasingly shifting toward the use of digital platforms and social media as more interactive and data-driven communication channels. According to Barten (2025), travel marketing strategies play a crucial role in enhancing the competitiveness of travel companies because they help organizations understand consumer behavior, build relationships with customers, and optimize the user experience through a more personalized and adaptive marketing approach to digital trends. These changes indicate that the success of travel organizations is determined not only by service quality but also by the effectiveness of the digital communication strategies they implement.

In the context of tourism and travel services, social media has become a primary source of information that influences the preferences and decisions of potential service users. Lalangan, (2020) research explains that travel content published on platforms such as YouTube and Instagram can shape the audience's perceptions of destinations and tourism services. Visual content and user experiences shared on social media can increase interest, build trust, and influence consumers' decisions when choosing travel services. This phenomenon demonstrates that social media serves not only as a promotional tool but also as an instrument for shaping an organization's image and credibility in the travel sector.

This situation is particularly relevant to religious travel services such as the organization of the Hajj and Umrah pilgrimages. Parker & Almayahi (2020) explain that Hajj and Umrah travel are activities with unique characteristics because they involve international mobility, large numbers of pilgrims, and a high demand for information regarding travel procedures, health, and religious preparation. These characteristics make trust and credibility crucial factors in pilgrims' decision-making processes. Therefore, Hajj travel organizers require effective communication strategies to build trust and foster closer relationships with prospective pilgrims.

Given this gap, this study offers a novel approach through an empirical analysis of Instagram Insights data from the accounts of Special Hajj Service Providers (PIHK) in West Java. The study integrates Instagram Insights metrics such as engagement rate, reach, impressions, audience profile, and content performance to evaluate the effectiveness of PIHK's digital communication strategies. Additionally, this study explores a research context that has received relatively little attention: the special Hajj services sector in West Java. The study is expected to provide theoretical contributions to the development of social media-based digital marketing studies, as well as practical insights for PIHKs in designing more effective, data-driven digital marketing strategies.

LITERATURE REVIEW

Numerous studies have explored Instagram Engagement Rate across sectors. Al Aufa et al. (2020) found a 40% increase in post frequency and engagement on hospital Instagram accounts during the pandemic. identified key engagement drivers for West Jakarta coffee shops, such as content type, captions, location, hashtags, and audio. Smura (2016) emphasized platform-specific

strategies: visual content boosts Facebook engagement, Twitter follower counts do not always correlate with engagement, and consistency on YouTube is vital.

Instagram's potential to foster community engagement has also been highlighted. Thomas et al. (2020) noted its effectiveness in enhancing participation and support. Nguyen et al. (2021) recommended best practices for SMEs, including strategic @tagging, audience-tailored content, and culturally relevant messaging. Doyle et al. (2022) linked engagement to hashtags, image quality, sponsorship, and teammate presence in athlete posts. McLeod-Morin et al. (2020) reported increased engagement from using imagery and characters in a public health campaign.

Cuevas-Molano et al. (2022) emphasized clarity, entertainment, and interactivity in boosting consumer engagement. Priadana et al. (2021) found that follower count does not equate to engagement, underscoring the importance of content quality in government health campaigns. Purba & Yulia (2021) proposed approaches to optimize Instagram impact based on engagement metrics. Rautio (2022) advocated for target market identification and two-way communication. Lastly, Cuevas-Molano et al. (2022) identified optimal timing and message size as key to improving branded content engagement on Instagram.

Social Media

Carr & Hayes (2015) define social media as online platforms that facilitate real-time or asynchronous interaction with broad or targeted audiences, driven by user-generated content. Similarly, Nasrullah (2016) describes social media as internet-based tools enabling communication, collaboration, and social interaction. Widely recognized platforms include Facebook, Instagram, and Twitter (McLeod-Morin et al., 2020). Instagram allows users to upload and enhance photos or videos with features such as captions, hashtags, and location tags (Santika et al., 2024; Sutanto, 2023).

Instagram serves not only for personal interaction but also as a tool for digital marketing, enabling direct engagement between companies and consumers. MSMEs can leverage Instagram to boost visibility and brand presence (Evanzha et al., 2021). According to Nguyen et al. (2021), Instagram supports business intelligence and value creation in Australian MSMEs by enabling collaboration with followers. Its visually driven interface also enhances content presentation, making it crucial for international marketing, particularly in branding and customer engagement. Doyle et al. (2022) reinforce this by modeling athletes' personal branding through Instagram. Meanwhile, Smura (2016) notes that on Twitter, engagement levels may not correlate directly with follower count, highlighting the complexity of digital engagement metrics across platforms.

Hajj

According to Kementrian Agama Republik Indonesia (2020), Hajj is a pilgrimage to the Ka'bah involving specific rites such as wukuf, mabit, tawaf, and sa'i performed at designated times to fulfill divine command and seek the pleasure of Allah SWT. Islamic teachings mandate that every adult Muslim who is physically and financially capable must perform Hajj at least once in their lifetime (Parker & Almayahi, 2020). The five conditions for its obligation include being Muslim, having reached puberty, soundness of mind, independence, and capability defined as physical, financial, and mental readiness (Alfiyanti et al., 2019; Aswandi, 2021). While Hajj is time-bound, Umrah may be performed at any time and is not compulsory (Parker & Almayahi, 2020).

Kemenag serves as the main regulator and service provider within the Hajj ecosystem, while Special Hajj Service Providers (PIHK) and Umrah Travel Service Providers (PPIU) manage

specialized Hajj and Umrah services. The relationship between beneficiaries and providers reflects a value exchange agreement (Sopyan et al., 2023). As Subhan et al. (2023) highlight, organizing Hajj and Umrah is a vital religious service, where service quality and trust significantly affect user satisfaction and long-term engagement.

HIMPUH, the Association of Umrah and Hajj Organizers, unites officially licensed PIHK and PPIU institutions. On October 15, 2006, Kemenag proposed the merger of three key associations AMPUH, AMPPUH, and SEPUH into a single unified body to enhance coordination and service quality within Indonesia's Hajj and Umrah sectors.

Instagram Engagement Rate

Instagram remains a dominant social media platform, enabling users to share photos and videos, and continues to be widely adopted in contemporary society (Sheldon & Bryant, 2016). A key metric on this platform is the engagement rate, which reflects user interaction through likes and comments (Arman & Sidik, 2019). Likes generally signal appreciation, while comments represent deeper user involvement through discussion (Bakhshi et al., 2014). The type of content significantly impacts engagement; for instance, Cuevas-Molano et al. (2022) found that videos with sound, multi-photo posts, and the use of hashtags increase likes, whereas polls, contests, and questions tend to generate more comments.

Several formulas have been developed to calculate Instagram engagement rates. Sutanto (2023) proposes a basic approach using the formula:

$$\text{Engagement Rate} = \frac{\text{Likes} + \text{Comments}}{\text{Total Followers}}$$

In contrast, Arman & Sidik (2019) introduced a more comprehensive formula, incorporating post frequency and the likelihood of followers seeing posts:

$$Er = \frac{\sum_{i=1}^n (Li + 2 Ci)}{3nPF} \times 100$$

Er = Engagement rate

L = Like

C = Comment

n = Total posts

P = Probability for followers to see posts

F = Total followers

Al Aufa et al. (2020) offer a simplified model:

$$Er = Li / nPF$$

Er = Engagement rate

L = Like

n = Total posts

P = Probability for followers to see posts

F = Total followers

These varying models demonstrate the evolving understanding of engagement metrics. For example, Arman & Sidik (2019) applied their formula in case studies involving Indonesian government ministries, while Pravina et al. (2023) analyzed engagement using different qualitative elements such as message clarity and design. Sutanto (2023) focused on the coffee shop industry, and Al Aufa et al. (2020) used the Mann-Whitney U test to analyze hospital Instagram engagement before and during the COVID-19 pandemic.

This study investigates engagement rates among Special Hajj Pilgrimage Organizers (PIHK) in West Java using posts, likes, and comments. Adopting Arman & Sidik (2019) formula, it uniquely expands on prior research by including followers and likes as variables, offering a more comprehensive analysis of factors influencing engagement across these Instagram accounts.

RESEARCH METHOD

The observed data include the number of likes, comments, posts, and followers from Instagram accounts of PIHK in West Java. Data were collected by reviewing Instagram insights based on (Himpunan Penyelenggara Umrah dan Haji, 2023). The study focuses on posts from 1 to 31 December 2023. This period was chosen because, in November 2023, the Director General of Hajj and Umrah, Hilman Latief, announced the 2024 Hajj agenda (Firmansyah, 2023; Hafil, 2024). This announcement, delivered during a Hajj Committee meeting, generated a positive response from prospective pilgrims in West Java.

Primary data were collected from PIHK Instagram accounts in West Java using 2023 HIMPUH data, including posts, likes, comments, and followers. Secondary data came from websites, brochures, books, and other relevant sources. The study population includes 29 HIMPUH-registered PIHKs in West Java, with the sample consisting of those with active Instagram accounts. Data from posts between 1–31 December 2023 were analyzed using the formula from Arman & Sidik (2019), assigning a weight of 1 to likes and 2 to comments. Engagement rate was calculated by summing followers, posts, likes, and comments. The Pearson correlation coefficient was used to analyze relationships among engagement rate, posts, and followers. Engagement values were then categorized based on engagement quality levels.

The research variables were developed with operationalisation as shown in Table 1.

Table 1.
Variable Operationalization

Variable	Descriptions	References
Er	The engagement rate is a metric that is used to evaluate the performance of an Instagram account.	(Arman & Sidik, 2019)
L	Like is a metric that shows how many Instagram users like the content they are posting.	(Arman & Sidik, 2019); (Bakhshi et al., 2014)
C	Comments are a measure of how many Instagram users are generally discussing the content posted on their accounts. Simply put, comments serve as an indicator of the level of discussion surrounding a piece of content.	(Arman & Sidik, 2019); (Bakhshi et al., 2014).
n	Post is content uploaded by an account on social	(Arman & Sidik, 2019);

	media.	(Bakhshi et al., 2014).
P	Probability is the likelihood of an account follower seeing a post.	(Arman & Sidik, 2019); (Bakhshi et al., 2014).
F	Follower is the number of followers of an account on social media.	(Arman & Sidik, 2019); (Bakhshi et al., 2014).

The data were analysed using the equation proposed by Arman & Sidik (2019). The numbers of likes and comments for each post published on the PIHK Instagram accounts between 1 and 31 December 2023 were recorded. The engagement rate of each account was calculated by summing the total number of likes and comments across all posts, assigning a weight of one to each like and two to each comment, following Arman & Sidik (2019). Prior to the correlation analysis, data normality was assessed using the Shapiro–Wilk test because the sample comprised only 20 Instagram accounts. As the normality assumption was not satisfied, Spearman's rank correlation coefficient was employed to examine the relationships among engagement rate, posts, followers, likes, and comments. Pearson's correlation analysis was additionally performed to facilitate comparison with the approach adopted by Arman & Sidik (2019). Finally, engagement rate values were classified into predefined ranges according to the quality of engagement.

RESULT

Data of the Instagram account of the PIHK in West Java

According to Himpunan Penyelenggara Umrah dan Haji (2023), 29 PIHKs were registered in West Java. Instagram accounts were identified through HIMPUPH membership lists, official websites, manual Google searches, and Instagram's search feature. Of the 29, 26 Instagram accounts were found, and their activity was monitored from December 1 to 31, 2023. Six accounts had no posts during this period, leaving 20 active accounts as the final research sample (Table 2). Account activity was analyzed using Instatrack, a third-party data scraping tool, which provided usernames, follower counts, post descriptions, likes, and comments. In total, the 20 active accounts had 216,610 followers and posted 538 times, receiving 20,758 likes and 525 comments during the observation period. All detailed data are presented in Table 2.

Table 2.
Engagement Rate of PIHK Instagram Accounts in West Java

No	Company Name	Instagram Username	Follower (F)	Post (n)	Comment	Like	Engagement rate (Er)
1	Elharamain Wisata	Elharamain wisata	87930	34	181	5408	0.64
2	Dago Wisata Tours & Travel	Dagowisata	25082	78	133	2621	0.49
3	Armada Safari Suci	Safarisuci	24110	15	37	599	0.62
4	Percikan Iman Tours & Travel	Perciktours	13859	34	95	5270	3.86
5	Jannah Firdaus Tour & Travel	jannah.firdaus.travel	13797	3	3	45	0.41
6	Noor Alia Haji Umroh	Nooraliahaji umroh	13175	37	5	598	0.42

7	Qiblat Tour Islami	Qiblattourislami	10950	169	0	3369	0.61
8	HaramainKU	Haramainku	5632	38	27	635	1.07
9	RH Tour & Travel	rhtours_	3665	4	3	56	1.41
10	Mihrab Qolbi Travel	Mihrabqolbi	2990	20	9	315	1.86
11	Karya Imtaq Tours & Travel	Karyaimtaq	2935	16	7	754	5.45
12	Arie Tour & Travel	Arietours	2318	18	0	77	0.62
13	Sanabil Tour & Travel	Sanabilpusatofficial	2153	5	0	66	2.04
14	Tunas Tours	Tunastourss	2080	1	2	61	10.42
15	PT Inti Ummul Quro	Hajiumrahuq	2034	4	9	144	6.64
16	Khadim Wisata	khadim_wisata	1603	8	0	103	2.68
17	Patra Haji Umroh	Patratour	855	38	11	486	5.21
18	Amara Umroh dan Haji	Amaraumrohdanhaji	556	11	2	100	5.67
19	Pesona Muda Prima Tour & Travel	Pesonamudaprima	449	3	0	36	8.91
20	Sangkan Hurip	sangkanhuri pbersama	437	2	1	15	6.48
Total			216610	538	525	20758	

Correlation Among the Study Variables (Comments, Likes, Followers, and Posts of PIHK Instagram Accounts in West Java)

To maintain consistency with the methodology proposed by Arman & Sidik (2019), the relationships among comments, likes, followers, and posts of PIHK Instagram accounts in West Java were initially analysed using Pearson's correlation coefficient. The complete Pearson correlation results are presented in Table 3

Table 3.
Pearson Correlations between follower, post, comment, like and engagement rate

		follower	Post	comment	like	engagement rate
Follower	Pearson Correlation	1	.193	.857***	.714***	-.398
	Sig. (2-tailed)		.414	<,001	<,001	.082
	N	20	20	20	20	20
Post	Pearson Correlation	.193	1	.222	.538*	-.392
	Sig. (2-tailed)	.414		.346	.014	.088
	N	20	20	20	20	20
Comment	Pearson Correlation	.857***	.222	1	.818***	-.303

	Sig. (2-tailed)	<,001	.346		<,001	.193
	N	20	20	20	20	20
Like	Pearson Correlation	.714***	.538*	.818***	1	-.288
	Sig. (2-tailed)	<,001	.014	<,001		.218
	N	20	20	20	20	20
engagement rate	Pearson Correlation	-.398	-.392	-.303	-.288	1
	Sig. (2-tailed)	.082	.088	.193	.218	
	N	20	20	20	20	20

***. Correlation is significant at the 0.001 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Data processed (2024)

The correlation coefficient (r) ranges from -1 to +1. An absolute value of 1 indicates a perfect correlation, while a value of 0 means there is no statistically significant correlation (Dancey & Reidy, 2014). The sign shows the direction: a positive r means both variables move in the same direction, and a negative r means they move inversely (Uriawan et al., 2020). Dancey & Reidy (2014) classify correlation strength as follows: (a) Zero ($0.00 < r < 0.05$), (b) Weak ($0.06 < r < 0.35$ or $-0.06 < r < -0.35$), (c) Moderate ($0.36 < r < 0.65$ or $-0.36 < r < -0.65$), (d) Strong ($0.66 < r < 0.95$ or $-0.66 < r < -0.95$), and (e) Perfect ($0.96 < r < 1.00$).

The correlation between comment and like variables is positive, with a Pearson correlation coefficient of 0.818. This value is significant at the 1% level, with a Sig. (2-tailed) value of 0.000. According to the classification by Dancey and Reidy, the strength of this correlation is categorized as strong. Therefore, the relationship between comment and like variables is both strong and statistically significant.

The correlation between comment and follower variables is positive, with an r-value of 0.857, indicating a strong relationship (Dancey & Reidy, 2014). This correlation is significant at the 1% level, with a Sig. (2-tailed) value of 0.000. Thus, the relationship between comments and followers is both strong and statistically significant.

In contrast, the correlation between comment and post variables is weak, with an r-value of 0.222. The Sig. (2-tailed) value is 0.346, showing it is not significant at either the 1% or 5% level. According to Dancey & Reidy (2014), this falls within the weak correlation category. Therefore, it can be concluded that there is no significant correlation between comments and the number of posts.

The like and follower variables show a strong positive correlation, with a Pearson r-value of 0.714, significant at the 1% level. The Sig (2-tailed) value is 0.000, indicating statistical significance. According to Dancey & Reidy (2014), this level of correlation is considered strong. Thus, the relationship between likes and followers is statistically significant.

The likes and posts variables also exhibit a positive correlation, with a Pearson r-value of 0.538. The Sig (2-tailed) value is 0.014, showing significance at the 5% level but not at 1%. Based on Dancey & Reidy (2014) classification, this represents a moderate correlation. Therefore, the

relationship between likes and posts is statistically significant at 5%, but not at the more stringent 1% level.

The follower and post variables show no significant correlation. The Pearson r-value is 0.193 with a Sig (2-tailed) value of 0.414, indicating non-significance at both 1% and 5% levels. This weak correlation is classified as such by Dancey & Reidy (2014), confirming the absence of a significant relationship.

Correlation between: comments and engagement rate (Er); likes and engagement rate (Er); followers and engagement rate (Er); and posts and engagement rate (Er) of PIHK Instagram accounts in West Java

The comment and engagement rate variables show no significant correlation. The Pearson r-value is -0.303 with a Sig (2-tailed) value of 0.193, indicating non-significance at both 1% and 5% levels. According to Dancey & Reidy (2014), this is classified as a weak correlation. Thus, the relationship between comment and engagement rate is not significant.

Similarly, like and engagement rate variables are not significantly correlated. The Pearson r-value is -0.288 , and the Sig (2-tailed) value is 0.218, which does not meet the 1% or 5% significance thresholds. This weak correlation is also classified as such by Dancey & Reidy (2014). Therefore, the correlation between like and engagement rate is considered not significant.

Follower and engagement rate variables show no significant correlation. The Pearson r-value is -0.398 , with a Sig (2-tailed) value of 0.082, which is not significant at the 1% or 5% levels. This correlation is classified as moderate (Dancey & Reidy, 2014). Therefore, the relationship between follower and engagement rate is not significant.

Likewise, post and engagement rate variables are not significantly correlated. The Pearson r-value is -0.392 , and the Sig (2-tailed) value is 0.088, indicating non-significance at both 1% and 5% levels. This is also considered a moderate correlation (Dancey & Reidy, 2014). Therefore, it is concluded that the correlation between post and engagement rate is not significant. The correlation results for all variables are summarized in Table 4.

Normality Test and Robustness Check

Table 4.
Normality Test: Kolmogorov-Smirnov dan Shapiro-Wilk

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
follower	.299	20	<,.001	.536	20	<,.001
post	.287	20	<,.001	.636	20	<,.001
comment	.369	20	<,.001	.584	20	<,.001
like	.366	20	<,.001	.628	20	<,.001
engagement rate	.205	20	.028	.849	20	.005

a. Lilliefors Significance Correction

Given the limited sample size ($n = 20$) and the highly skewed distribution of follower counts across the PIHK Instagram accounts in West Java, ranging from 437 (Sangkan Hurip) to 87,930 (Elharamain Wisata), the normality of the data was assessed prior to conducting the correlation analysis. This assessment was undertaken to verify whether the assumptions underlying Pearson's

correlation were satisfied. Two normality tests, namely the Kolmogorov–Smirnov and Shapiro–Wilk tests, were employed, and the results are presented in Table 4.

The Kolmogorov–Smirnov test indicated that none of the study variables followed a normal distribution ($p < 0.05$). The significance values for followers, posts, comments, and likes were all below 0.001, indicating substantial departures from normality, whereas the engagement rate produced a significance value of 0.028. Because the sample consisted of only 20 observations, the Shapiro–Wilk test, which is generally recommended for small samples, was subsequently used to further assess data normality. Consistent with the Kolmogorov–Smirnov results, the Shapiro–Wilk test confirmed that all variables were not normally distributed. The significance values for followers, posts, comments, and likes were all below 0.001, while the corresponding W statistics were considerably lower than 1, indicating marked deviations from normality (Table 4). These findings are consistent with the inherent characteristics of social media data, particularly the highly unequal distribution of follower counts, which typically ranges from only a few hundred to tens of thousands of followers.

Table 5.
Spearman correlation

			follower	post	comment	like	engagement rate
Spearman's rho	follower	Correlation Coefficient	1.000	.520*	.624**	.662**	-.766***
		Sig. (2-tailed)		.019	.003	.001	<.001
		N	20	20	20	20	20
	post	Correlation Coefficient	.520*	1.000	.458*	.835***	-.536*
		Sig. (2-tailed)	.019		.042	<.001	.015
		N	20	20	20	20	20
	comment	Correlation Coefficient	.624**	.458*	1.000	.656**	-.214
		Sig. (2-tailed)	.003	.042		.002	.365
		N	20	20	20	20	20
	like	Correlation Coefficient	.662**	.835***	.656**	1.000	-.360
		Sig. (2-tailed)	.001	<.001	.002		.119
		N	20	20	20	20	20
	engagement rate	Correlation Coefficient	-.766***	-.536*	-.214	-.360	1.000
		Sig. (2-tailed)	<.001	.015	.365	.119	
		N	20	20	20	20	20

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

***. Correlation is significant at the 0.001 level (2-tailed).

As both normality tests confirmed that the data violated the assumption of normality, Spearman's rank correlation coefficient was subsequently employed as a robustness check to verify whether the observed relationships remained consistent despite the non-normal distribution of the data. Unlike Pearson's correlation, Spearman's correlation does not assume normally distributed data and is more robust to right-skewed distributions and the presence of extreme values (outliers). The complete results of the Spearman correlation analysis are presented in Table 5.

The Spearman analysis revealed a strong positive correlation between followers and comments ($\rho = 0.624$, $p = 0.003$), indicating that PIHK Instagram accounts with larger follower bases tended to receive more comments. This finding is consistent with the Pearson correlation

reported previously ($r = 0.857$), although the correlation coefficient was slightly lower because Spearman's method is based on ranked rather than raw observations.

A similarly strong positive correlation was observed between comments and likes ($\rho = 0.656$, $p = 0.002$), suggesting that posts attracting more comments also tended to receive more likes. This result is likewise consistent with the Pearson correlation ($r = 0.818$). The strongest association among all study variables was identified between posts and likes ($\rho = 0.835$, $p < 0.001$), indicating that more frequent posting was associated with a greater number of likes. This finding suggests that posting frequency plays an important role in enhancing user interaction with PIHK Instagram content.

A moderate positive correlation was identified between posts and comments ($\rho = 0.458$, $p = 0.042$). Unlike the Pearson analysis, which indicated that this relationship was not statistically significant, the Spearman analysis demonstrated a significant monotonic association. This finding suggests that although the relationship between posting frequency and comments is not strictly linear, increased posting activity is generally associated with greater user participation through comments. Furthermore, followers and posts exhibited a moderate positive correlation ($\rho = 0.520$, $p = 0.019$), indicating that PIHK Instagram accounts with larger follower bases also tended to publish content more frequently.

Overall, the Spearman correlation analysis produced results that were largely consistent with those obtained from the Pearson correlation analysis, indicating that the principal findings of this study are robust despite the violation of the normality assumption and the relatively small sample size.

Engagement Rate of PIHK Instagram Accounts in West Java

The engagement rate for each PIHK Instagram account was calculated using Equation 2 proposed by Arman & Sidik (2019). A total of 538 Instagram posts published by the 20 PIHK accounts during the observation period were analysed by recording the numbers of likes and comments, assigning a weight of one to each like and two to each comment. The engagement rate was first calculated for each individual post and subsequently averaged for each Instagram account. The engagement rate values for all PIHK Instagram accounts in West Java are presented in Table 2.

The Spearman correlation analysis revealed a strong negative association between followers and engagement rate ($\rho = -0.766$, $p < 0.001$). This finding indicates that accounts with larger follower bases tended to exhibit lower engagement rates. Such a pattern is commonly observed on social media platforms, where larger accounts generally receive higher absolute numbers of likes and comments but lower interaction rates relative to their total number of followers.

A moderate negative correlation was identified between the number of posts and engagement rate ($\rho = -0.536$, $p = 0.015$), suggesting that more frequent posting was associated with lower engagement rates. This finding indicates that increasing posting frequency alone does not necessarily improve audience engagement and may instead reduce the level of interaction achieved by individual posts.

No statistically significant relationship was observed between comments and engagement rate ($\rho = -0.214$, $p = 0.365$). Similarly, the correlation between likes and engagement rate was not statistically significant ($\rho = -0.360$, $p = 0.119$). These findings suggest that neither the absolute

number of comments nor the number of likes independently explains variations in engagement rate across PIHK Instagram accounts.

Determining the quality of engagement rates (Er) of the PIHK Instagram account in West Java

The assessment of engagement rate quality follows Arman & Sidik (2019). Instagram accounts are categorized by follower count: <5K, 5K–20K, 20K–100K, 100K–300K, and >300K. Each category is ranked by average engagement rate, 7.58, 4.98, 2.65, 2.37, and 1.72 ranging from highest to lowest. These ranks are further classified into three engagement quality levels: low, good, and high (Table 6.).

Table 6. Classification of Engagement Rate Values

Numbers of Followers	Average Er	Er Range	ER Quality
<5K	7,58	<7,58	Low Engagement Rate
		7,58-8,58	Good Engagement Rate
		>8,58	High Engagement Rate
5K-20K	4,98	<4,98	Low Engagement Rate
		4,98-5,98	Good Engagement Rate
		>5,98	High Engagement Rate
20K-100K	2,65	<2,65	Low Engagement Rate
		2,65-3,65	Good Engagement Rate
		>3,65	High Engagement Rate
100K-300K	2,37	<2,37	Low Engagement Rate
		2,37-3,37	Good Engagement Rate
		>3,37	High Engagement Rate
>300K	1,72	<1,72	Low Engagement Rate
		1,72-2,72	Good Engagement Rate
		>2,72	High Engagement Rate

Source: Arman and Sidik (2019):

A high engagement rate indicates strong account performance, suggesting the account is favored and influential among followers, who interact at above-average levels. Higher engagement rates reflect better account quality, as follower interactions are stronger. Accounts with good engagement quality show they perform well and can influence followers to engage actively. Conversely, accounts with low engagement quality are considered underperforming, indicating they have not yet optimized follower engagement potential.

Referring to Arman & Sidik (2019), PIHK Instagram accounts in West Java are grouped by follower count. The 20K–100K group includes Elharamain Wisata, Dago Wisata Tours & Travel, and Armada Safari Suci. The 5K–20K group includes five accounts: Percikan Iman, Jannah Firdaus, Noor Alia, Qiblat Tour Islami, and HaramainKU. The <5K group consists of 12 accounts, including rhtours, mihrabqolbi, karyaimtaq, Arietours, and others.

Table 7.
Engagement Rate Quality of PIHK Instagram Accounts in West Java

NO	PIHK's Name	Instagram Username	Follower (F)	Post (n)	Comment	Like	Engagement Rate (Er)	Engagement Rate Range	Quality of Engagement Rate
1	Elharamain Wisata	Elharamainwisata	87.930	34	181	5.408	0.64	<2,65	Low
2	Dago Wisata Tours & Travel	Dagowisata	25.082	78	133	2.621	0.49	<2,65	Low
3	Armada Safari Suci	Safarisuci	24.110	15	37	599	0.62	<2,65	Low
4	Percikan Iman Tours & Travel	Perciktours	13.859	34	95	5.270	3.86	<4,98	Low
5	Jannah Firdaus Tour & Travel	jannah.firdaus.travel	13.797	3	3	45	0.41	<4,98	Low
6	Noor Alia Haji Umroh	Nooraliahajiumroh	13.175	37	5	598	0.42	<4,98	Low
7	Qiblat Tour Islami	Qiblattourislami	10.950	169	0	3.369	0.61	<4,98	Low
8	HaramainKU	Haramainku	5.632	38	27	635	1.07	<4,98	Low
9	RH Tour & Travel	rhtours_	3.665	4	3	56	1.41	<7,58	Low
10	Mihrab Qolbi Travel	Mihrabqolbi	2.990	20	9	315	1.86	<7,58	Low
11	Karya Imtaq Tours & Travel	Karyaimtaq	2.935	16	7	754	5.45	<7.58	Low
12	Arie Tour & Travel	Arietours	2.318	18	0	77	0.62	<7.58	Low
13	Sanabil Tour & Travel	Sanabilpusatofficial	2.153	5	0	66	2.04	<7.58	Low
14	Tunas Tours	Tunastourss	2.080	1	2	61	10.42	>8,58	High
15	PT Inti Ummul Quro	Hajiumrahuq	2.034	4	9	144	6.64	<7.58	Low
16	Khadim Wisata	khadim_wisata	1.603	8	0	103	2.68	<7.58	Low
17	Patra Haji Umroh	Patratour	855	38	11	486	5.21	<7.58	Low
18	Amara Umroh dan Haji	Amaraumrohdanhaji	556	11	2	100	5.67	<7.58	Low

19	Pesona Muda Prima Tour & Travel	Pesonamuda prima	449	3	0	36	8.91	>8,58	High
20	Sangkan Hurip	Sangkanhurip bersama	437	2	1	15	6.48	<7.58	Low

Source: Data processed (2024)

The measurement results of engagement rate quality for PIHK Instagram accounts in West Java show that all accounts in the 20K–100K follower group Elharamain Wisata, Dago Wisata Tours & Travel, and Armada Safari Suci have low engagement quality. Similarly, all accounts in the 5K–20K group: Percikan Iman, Jannah Firdaus, Noor Alia, Qiblat Tour Islami, and HaramainKU, also show low engagement quality. In the <5K follower group, only two accounts, Tunastourss and Pesonamudaprima, have high engagement rate quality. The remaining ten accounts: rhtours, mihrabqolbi, karyaimitaq, Arietours, sanabilpusatofficial, hajiumrahuq, khadim_wisata, patratour, amaraumrohhdanhaji, and sangkanhuripbersama are classified as having low engagement rate quality.

DISCUSSION

Correlation between comment and like; commen and follower; commen and post; like and post; follower and post of PIHK Instagram accounts in West Java

The results demonstrate a positive correlation between comments and likes on West Java PIHK Instagram accounts, where an increase in one variable tends to accompany an increase in the other (Uriawan et al., 2020). This indicates a general trend that posts with more comments also receive more likes. However, such correlation should not be interpreted as causation (Chan, 2004). Supporting this, Saeidi & Baradari (2023) found that the correlation between likes and comments was statistically insignificant.

Similarly, comments and followers show a positive correlation, suggesting that higher engagement in the form of comments may coincide with increased follower counts. Nevertheless, this does not imply a causal relationship Chan (2004) and Saeidi & Baradari (2023) likewise reported the correlation between followers and comments to be statistically insignificant. These findings suggest that while interaction metrics may increase together, they do not necessarily influence each other directly.

No statistically significant correlation was observed between comments and posts, indicating that the number of comments does not relate to the volume of content published (Dancey & Reidy, 2014). In contrast, likes and followers exhibit a positive correlation, where increased likes tend to be associated with more followers. However, this relationship remains non-causal (Chan, 2004), as Saeidi & Baradari (2023) also reported no statistically significant correlation between these variables.

A moderate positive correlation exists between likes and posts (Cohen, 2013), suggesting that increased likes may be associated with more frequent posting. While this may hint at an indirect influence of audience engagement on posting behavior, it should not be interpreted as causal (Chan, 2004). Nonetheless, Saeidi & Baradari (2023) found that an increase in posts might attract more user engagement in the form of likes.

There is no statistically significant correlation between followers and posts, indicating that follower count does not influence posting frequency. This contrasts with findings by Arman & Sidik (2019), who identified a strong correlation between posting frequency and follower growth. The discrepancy likely stems from differences in user behavior, as Arman & Sidik (2019) focused on governmental Instagram accounts, while the current study examines PIHK accounts in West Java.

Correlation between comments and engagement rate (Er); likes and engagement rate (Er); followers and engagement rate (Er); posts and engagement rate (Er) of PIHK Instagram accounts in West Java

There is no statistically significant correlation between comments and engagement rate on the West Java PIHK Instagram account, indicating there is little to no relationship between the two variables ((Dancey & Reidy, 2014). An increase in the number of comments does not result in a higher engagement rate, nor does a decrease in comments lead to a lower engagement rate. Similarly, no statistically significant correlation exists between likes and engagement rate, showing that the number of accounts liking the posts does not affect engagement (Dancey & Reidy, 2014). A higher number of likes does not increase the engagement rate, and fewer likes do not lead to lower engagement.

The relationship between the number of followers and engagement levels is not statistically significant. This is consistent with the findings of Priadana et al. (2021), which show that an increase in the number of followers does not always correlate directly with higher engagement levels. This finding partially contradicts the research by Arman & Sidik (2019), who found a negative correlation between the number of followers and engagement levels. It means that a larger follower base tends to result in lower engagement levels. Nevertheless, the direction of the relationship in Arman and Sidik's study aligns with the pattern observed in this study, where accounts with the largest follower bases (e.g., @elharamainwisata with 87,930 followers) recorded the lowest engagement rates (0.64). However, the correlation in this study did not reach statistical significance, likely due to the small sample size ($n=20$) and the specific characteristics of the PIHK audience.

This pattern is further supported by Tafesse & Wood (2021), who empirically demonstrated, using a sample of 133 Instagram influencers, that the number of followers is negatively correlated with follower engagement levels ($\beta = -0.46$, $p < 0.01$). They explain this through social influence theory: as the number of followers on an account increases, followers' sense of identification and personal attachment decreases, thereby weakening their motivation to engage. It should be noted that Tafesse and Wood studied commercial influencers, whereas this study examines providers of religious travel services. The consistency of this pattern across two fundamentally different contexts strengthens the argument that the inverse relationship between follower count and engagement quality is a cross-sector phenomenon, not merely a finding specific to commercial media.

The relationship between followers and engagement rate is also statistically insignificant, with no statistically significant correlation observed (Dancey & Reidy, 2014). This implies that fluctuations in follower count whether increases or decreases do not impact the engagement rate on the West Java PIHK Instagram account. These findings support those of Priadana et al. (2021), who similarly found that an increase in followers does not necessarily correspond to higher engagement rates. However, these results contrast with the findings of Arman and Sidik (2019),

who identified a negative correlation between followers and engagement, suggesting that a higher follower count may lead to an increase in engagement rate. The same pattern is evident in the relationship between posts and engagement rate. There is no statistically significant correlation between the number of posts and engagement, meaning that increased posting frequency does not affect engagement rate (Dancey & Reidy, 2014). An increase in the number of posts does not lead to increased engagement. This finding is inconsistent with Arman & Sidik (2019), who reported a negative correlation, suggesting that more frequent posting may in fact enhance engagement. Nirmala et al. (2021) found that photo quality and posting times influence reach and engagement. Accounts like @qiblattourislami post as many as 169 times a month, but their engagement rate remains low at 0.61. This means that if high posting frequency isn't supported by the right content strategy, it won't be effective. These findings are also consistent with the hydroponics sector as reported by Pravina et al. (2023).

Overall, the findings reveal that key Instagram metrics: comments, likes, followers, and posts do not have a direct relationship with engagement rate on West Java PIHK Instagram accounts. These results challenge the common assumption that higher activity and visibility automatically translate into greater engagement, and they highlight the importance of considering contextual and audience-specific factors in digital engagement strategies.

Determining the quality of engagement rates (Er) of the PIHK Instagram account in West Java

West Java PIHK Instagram accounts are categorized into three follower-based groups: those with 20K–100K followers (e.g., Elharamain Wisata, Dago Wisata Tours & Travel, and Armada Safari Suci), those with 5K–20K followers (e.g., Percikan Iman Tours & Travel, Jannah Firdaus Tour & Travel, Noor Alia Hajj Umrah, Qiblat Tour Islami, and HaramainKU), and those with fewer than 5K followers (e.g., Tunastourss, Pesonamudaprima, rhtours, mihrabqolbi, karyaimtaq, Arietours, and others).

Among these, two accounts stand out with high engagement quality: @tunastourss and @pesonamudaprima. The @tunastourss account, with 2,080 followers, achieved an engagement rate of 10.42 despite posting only once. This post garnered two comments and 61 likes. Based on Bakhshi et al. (2014), comments represent user interaction through discussion, while likes indicate content appreciation. The high engagement rate of @tunastourss suggests that its relatively small follower base is highly interactive. This aligns with Arman & Sidik (2019), who highlight how smaller, more dedicated audiences can yield higher engagement rates. Similarly, @pesonamudaprima achieved an engagement rate of 8.91 with 449 followers and three posts, which received 36 likes but zero comments. While the absence of comments indicates limited discussion, the volume of likes in relation to followers still demonstrates a relatively high level of user involvement (Arman & Sidik, 2019; Bakhshi et al., 2014).

In contrast, 18 other West Java PIHK accounts exhibited low engagement rates. For example, @elharamainwisata, the account with the largest number of followers (87,930), had an engagement rate of only 0.64. Between 1 and 31 December 2023, the account posted 34 times, receiving 181 comments and 5,408 likes. Despite high posting activity and a large follower base, the interaction ratio remains low, indicating limited user engagement (Bakhshi et al., 2014). The @dagowisata account, with 25,082 followers, posted 78 times during the study period, receiving 133 comments and 2,621 likes. Its engagement rate was 0.49. Although the account was highly active, the ratio of interactions to followers was minimal, suggesting low audience responsiveness (Bakhshi et al., 2014).

Likewise, @qiblattformislami, with 10,950 followers, posted 169 times and received 3,369 likes but no comments, resulting in an engagement rate of 0.61. The absence of comments implies a lack of interactive discussion, and the ratio of likes to followers remains low. Despite frequent posting more than once per day, the account's user engagement is minimal, echoing the trend observed in other large-follower accounts (Bakhshi et al., 2014).

These findings underscore a consistent pattern: accounts with a large follower base and high posting frequency do not necessarily achieve high engagement rates. In fact, accounts with fewer followers, such as @tunastourss and @pesonamudaprima, show higher engagement rates, suggesting that follower quantity does not guarantee active audience interaction. This supports the assertion by Arman & Sidik (2019) that smaller, targeted audiences may yield better engagement outcomes.

Overall, the analysis reveals that meaningful engagement on Instagram is not solely driven by follower count or posting frequency, but rather by the quality and responsiveness of the audience. Metrics such as likes and comments, as interpreted by Bakhshi et al. (2014), are essential in assessing genuine user involvement, which often varies across account size and activity level.

CONCLUSION

This study concludes that among PIHK Instagram accounts in West Java, there are positive correlations between comments and likes, comments and followers, likes and followers, and likes and posts. However, no significant correlations were found between comments and posts, or between followers and posts. Furthermore, the analysis reveals no significant relationship between any of the measured variables comments, likes, followers, and posts and the engagement rate, indicating that high interaction metrics do not necessarily translate into higher engagement. Among the 20 PIHK Instagram accounts analyzed, only two @tunastourss and @pesonamudaprima achieved high engagement scores of 10.42 and 8.91, respectively, while the remaining 18 accounts exhibited low engagement rates. These findings suggest that while individual interaction metrics are interrelated, they are not reliable predictors of engagement rate performance, emphasizing the need for more strategic content and audience engagement approaches in social media management for PIHK organizations.

Research limitations

This research has limitations, including:

- a. The observed correlations between engagement rate and likes, comments, and followers should be interpreted cautiously because these variables are constituent elements of the engagement rate calculation.
- b. The research did not discuss the engagement rate with marketing strategies through social media, especially Instagram. This is in order to be able to determine how PIHK maximises the use of Instagram accounts to increase brand awareness, so that it has a direct impact on the sale of special Hajj services.
- c. This research does not discuss the number of pilgrims of each PIHK, so it cannot reveal the correlation between the level of engagement of Instagram accounts and the number of pilgrims of PIHK.

Implications and recommendations

Based on the results of data analysis, there are several implications that need to be followed up, including:

- a. The PIHK must have clear objectives for social media marketing.
- b. The PIHK must develop a comprehensive, effective and consistent social media strategy to achieve its objectives.
- c. These objectives include increasing awareness, building digital communities and converting to sales.
- d. The social media strategy can be implemented with a more selective quality and type of content.
- e. PIHK is expected to create daily content types with posting times and copywriting diction that encourages interaction with the audience. This is because each point affects different segmentation and audience reach.
- f. PIHKs should also adjust the social media they use as each social media has different audience segmentation.

There are several recommendations for further research development, including:

- a. Research can be developed with other variables such as posting time, content type (photos, videos and short videos) or others.
- b. The research could be extended to other provincial PIHK organisations.
- c. The research can be developed by changing or adding research objects, e.g. for PPIU only or combined with PIHK.
- d. The duration of the study can be extended to be longer.
- e. Future research can examine the correlation between the level of social media engagement and the number of pilgrims.

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