

## The effect of visual content and posting frequency on Instagram social media engagement of east java gymnastics organization

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### Abstract

This study aims to examine the influence of visual content and posting frequency on engagement on the Instagram social media of the Persani East Java organization. Persani, officially known as Persatuan Senam Indonesia, is the Indonesian Gymnastics Federation and the umbrella organization for gymnastics in Indonesia. The study uses a quantitative approach, which means it collects and analyzes numerical data to identify patterns or relationships objectively. Specifically, it employs survey methods, where questionnaires are distributed to gather data from respondents, likely followers or users interacting with the Persani East Java Instagram account. Alongside, the study incorporates secondary data analysis by examining existing data from the Instagram account, such as follower engagement metrics, post frequencies, and content types. This combination allows the researchers to statistically analyze how visual content and posting frequency influence engagement levels on the platform with scientific rigor and reliability. Data analysis methods probably include statistical tools to test hypotheses and measure correlations between the variables under study. The results showed that visual content, especially the reels format, had the most dominant influence on follower engagement, followed by an optimal posting frequency between 5 to 7 times a week. Additionally, the majority of followers are loyal audiences with a fairly active level of interaction. The findings indicate that the quality of engaging visual content and consistency in upload frequency are key factors in improving audience engagement. This research contributes to digital strategy development for sports organizations and enhances digital marketing literature in the field of sports, particularly gymnastics.

**Keywords:** Visual Content; Instagram; Sports Organizations; Social Media; Digital Strategy; Sports Marketing

### 1. Introduction

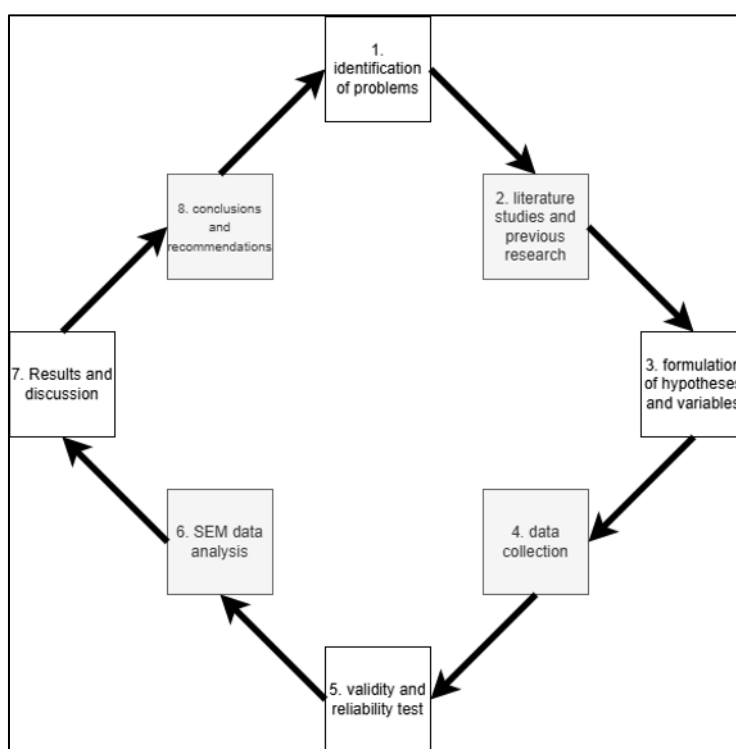
Social media has become one of the main platforms for building interaction and communication between organizations and the wider community (Bayu Wibisono et al., 2023). Instagram, in particular, with its powerful visual features, provides a great opportunity for sports organizations such as East Java gymnastics organizations to promote their activities, achievements, and programs effectively (Chakraborty & Jain, 2022). Visual content is a key element because it can attract the attention of the audience, increase appeal, and strengthen the message that is to be conveyed (Zhang et al., 2022). In addition, the frequency of posts is also considered to have a significant influence on building and maintaining audience engagement on social media (Reimer, 2023). Engagement itself is very important for organizations (Mishnick & Wise, 2024), as it reflects how active and responsive the audience is to the content presented, which in turn can improve the visibility and image of the organization (Ao et al., 2023).

However, in practice, there is still ignorance regarding how the optimal effect of the variety of visual content types uploaded and how often posts are made to achieve maximum engagement (Ram & Bhardwaj, 2018). For sports

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organizations such as the East Java gymnastics organization, which aims to increase attention and support from the community and fans, it is important to know the right strategy in using Instagram as a means of communication and promotion (Prasetio et al., 2022). Content types such as videos, dynamic photos, and infographics have different impacts on user engagement rates, and that posting too often or infrequently can negatively impact audience responses (Chan et al., 2023). Therefore, there is a need for an empirical study that maps the relationship between visual content and posting frequency with engagement in the context of regional sports organizations.

This research is particularly relevant in today's digital era, where sports organizations are required to not only excel in physical achievement but also to be able to utilize information technology to build communities and expand their range of influence (Qi et al., 2024). From previous research, there are several research gaps that can be the focus of this study, including the lack of research in Indonesia related to social media engagement of sports organizations, especially in the gymnastics branch. This research is expected to contribute to several aspects, including: 1.) developing a quantitative model that measures how visual content and post frequency simultaneously affect engagement on Instagram, Persani, East Java. 2.) Provide empirical data on the most effective digital strategies to increase engagement in sports organizations in Indonesia. 3.) Provide practical recommendations for the management of East Java Persani in optimizing their social media strategies and expanding the literature on sports digital marketing with a focus on the gymnastics branch, which is still rarely researched.



**Figure 1** Research Design Scheme

## 2. Methodology

### 2.1. Study Participants and Organization

This study uses a quantitative approach with survey methods and secondary data analysis from the East Java Persani Instagram account. Instagram users who follow the official account of Persani East Java are the population, and the sample is taken using purposive sampling with criteria: 1.) At least 3 months of following the East Java Persani account, 2.) Have interacted with uploads in the form of likes, comments, or shares. Then the sample size is determined using the Slovin formula.

### 2.2. Data Analysis Technique

The data collection technique consists of primary and secondary data. Primary data is in the form of a questionnaire that is distributed to followers of the East Java Persani account to measure their perception of visual content and post

frequency. Secondary data includes the collection of engagement data from Instagram Persani East Java, including the number of likes, comments, shares, and saves in a certain period. In more detail, the stages in collecting (a) Primary Data include: (1) compiling a survey questionnaire, (2) using a likert measurement scale ranging from 1-5, (3) determining the respondent sample using purposive sampling with the number of samples calculated using the Slovin formula, resulting in 348 respondents with a margin of error of 5%, (4) and then distributing the questionnaire to the sample.

Next, after the primary data has been collected, what is done is to collect (b) Secondary Data which includes: (1) collecting Instagram engagement data (using Instagram insights/Hootsuite) to collect like, comment, share, and save data in the last 3 months with visual content types including photos, videos, reels, and frequency of posts per week and upload time, (2) classify data based on the highest level of interaction and type of visual content.

After collecting all primary and secondary data, the next validity and reliability test will be carried out to ensure data consistency. Then, continued descriptive analysis in understanding the engagement pattern, and processing data on multiple linear regression or SEM (Structural Equation Modeling) to test the relationship and influence between each variable. Here are the conceptual theories from this study:

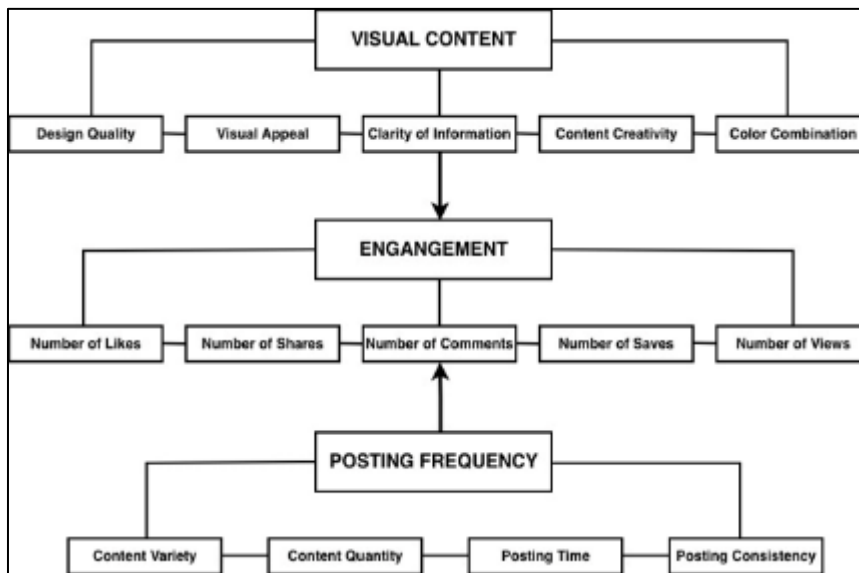


Figure 2 Research Conceptual Theory

### 3. Results

Table 1 Descriptive Analysis of Instagram Engagement in East Java (3 Months)

Month	Content Type	Number of Posts	Total Likes	Total Comments	Total Shares	Average engagement per Post
July 2025	Image	15	1.850	92	185	142
	Video	8	1.120	67	112	162
	Reels	5	1.035	78	155	254
	Stories	12	740	45	90	73
Total July		40	4.745	282	542	139
August 2025	Image	14	1.680	84	168	138
	Video	9	1.350	81	135	174
	Reels	6	1.380	96	192	278
	Stories	10	650	38	75	76

August total		39	5.060	299	570	152
September 2025	Image	13	1.690	85	169	150
	Video	8	1.280	77	128	186
	Reels	4	1.120	84	168	343
	Stories	8	520	31	62	77
Total September		33	4.610	277	527	164
Monthly average	Image	14.0	1.740	87	174	143
	Video	8.3	1.250	75	125	174
	Reels	5.0	1.178	86	172	292
	Stories	10.0	637	38	76	75
Total average		37.3	4.805	286	546	152

Table 1 shows that the level of engagement on the Persani East Java Instagram account varies greatly based on the type of content and the month of observation. Consistently, reels generate the highest engagement each month, with an average of 292 interactions per upload, far surpassing videos (174), photos (143), and stories (75). These findings indicate that dynamic and short-form content formats are more effective at attracting audience attention, in line with the visual media consumption patterns that are now dominated by short videos. In addition, the trend of increasing average engagement from July (139) to August (152) and September (164) shows that Persani East Java's content strategy has gradually improved. Overall, this descriptive data emphasizes the importance of choosing content types, especially reels, to maximize audience interaction on Instagram.

**Table 2** Correlation of Content Type vs Engagement Metrics

Content Type	Avg. Likes	Avg. Comments	Avg. Shares	Performance Index
Image	245	18	35	78
Video	312	25	48	92
Reels	487	42	89	145

Table 2. Illustrating the strong relationship between content type and engagement performance, where reels are again the highest-performing type of content, shown by the highest average likes (487), comments (42), shares (89), and the most dominant performance index (145). Videos take second place, while photos are always at the bottom. This pattern confirms that motion-based and emotional content encourages more interaction than static image content. Thus, the relationships shown by this table reinforce the argument that the choice of visual formats is an important determinant in a sports organization's social media strategy.

**Table 3** Respondent Profile (n=348)

Characteristics	Category	Jumlah	%	Characteristics
Follow-up Period	3-6 months	156	44.8%	Follow-up Period
	>6 months	192	55.2%	>6 months
Frequency of Interaction	1x/week	210	60.3%	Frequency of Interaction
	>3x/week	138	39.7%	>3x/week

Table 3 displays the characteristics of the respondents and shows that most of the followers of Persani East Java have followed the account for more than six months (55.2%). This indicates that the majority of respondents are relatively loyal followers. In terms of interaction intensity, users who interacted at least once a week amounted to 210 people (60.3%), while interactions above three times a week reached 138 people (39.7%). This composition shows that most of the audience is actively interacting, but not yet at an intensive engagement level. This data gives an idea that Persani

East Java has a stable follower base, but content strategy optimization can increase user interaction, which is still in the moderate category.

**Table 4** Validity and Reliability Tests

Variabel	Indicator	Loading Factor	Cronbach's Alpha	Information
Visual Content	KV1	0.78	0.86	Valid & Reliabel
Frequency of Posting	FP1	0.71	0.79	Valid & Reliabel
Engagement	ENG1	0.81	0.88	Valid & Reliabel

Table 4. The above shows that all variable indicators have a loading factor above 0.70, and Cronbach's Alpha value is in the range of 0.79–0.88. The visual content construct, posting frequency, and engagement can be stated to have strong internal consistency and to be able to accurately measure the concept in question. The reliability of this instrument provides a solid basis for advanced analysis such as SEM-PLS.

**Table 5** Hypothesis Test Results with SEM-PLS

Hipotesis	Path Coefficient	T-Statistics	P-Values	Results
H1: Accounts Visual → Engagement	0.48	5.23	0.000	Accepted
H2: Frequency of Posts → Engagement	0.32	3.87	0.002	Accepted

The results of the hypothesis testing in Table 5 show that both research hypotheses are accepted. The visual content variable had a significant effect on engagement (path = 0.48;  $p = 0.000$ ), making it the most dominant factor. Meanwhile, the frequency of posts also showed a significant influence (path = 0.32;  $p = 0.002$ ), although not as strong as visual content. This pattern indicates that the quality of content is more important than the quantity of uploads in attracting user interaction.

**Table 6** Triangulation of Primary and Secondary Data

Variabel	Quantitative Findings	Secondary Data Support	Confirmation
Visual Content	Path = 0.48	Reels engagement is 89% higher	Consistent
Frequency of Posting	Path = 0.32	Optimal 5-7/week	Consistent

Table 6 shows the consistency between quantitative findings and secondary data. The significant influence of visual content (path = 0.48) was in line with reels engagement data, which was recorded 89% higher than other formats. Similarly, the effect of post frequency (path = 0.32) was consistent with secondary data showing that optimal performance occurred at a frequency of 5–7 uploads per week. The consistency between these two data sources shows that the research results are not only statistically strong but also empirically relevant based on the digital practices of East Java Persani.

## 4. Discussion

### 4.1. Interpretation of Overall Findings

The results of this study generally show that visual content and post frequency have a significant influence on engagement on Persani East Java Instagram accounts. The uneven engagement patterns on each type of content confirm that visual formats play a dominant role in shaping audience responses. Reels consistently generate the highest engagement, while stories show the lowest performance. These findings are in line with the recent literature that confirms that short video-based content is able to create stronger cognitive stimulation and trigger more intense interactions than static image-based content (Yan et al., 2023). Overall, the results of the study illustrate that the success of Persani East Java's social media strategy is largely determined by the quality of visual content and a consistent upload rhythm.

#### **4.2. Visual Content Effects on Engagement**

Visual content proved to be the most dominant factor with a path coefficient value of 0.48, making it a major predictor of influencing engagement. These findings are in line with the research of (Ashley & Tuten, 2015), who stated that creative and visual content can build emotional closeness with the audience, thereby triggering higher interactions. Secondary data shows that reels have up to 89% higher engagement than other types of content. This pattern can be explained through cognitive image processing theory, where dynamic visuals are easier for the brain to process and produce stronger affective responses (Li & Xie, 2020). These results also strengthen the argument of Mukherje (2020) that an effective visual content strategy is the main foundation of engagement in modern digital marketing. In the context of sports organizations, visual content featuring athletes, training moments, and competition highlights provides authentic value that increases the emotional closeness of followers to the organization's brand (Geurin & Burch, 2017).

#### **4.3. Posting Frequency and Its Role in Engagement**

Post frequency has a significant influence with a path coefficient of 0.32. Although not as dominant as visual content, this variable remains an important factor in maintaining the rhythm of audience interaction. The results show that the highest engagement occurs at the frequency of uploads of 5–7 times per week. This pattern is consistent with research by Liadeli et al. (2023), who found that posts are consistently able to increase user exposure and interaction. This is reinforced by the theory of brand visibility, which states that continuous exposure to content creates familiarity, thereby increasing the probability of interaction (De Vries et al., 2017). Thus, the management of Persani East Java needs to maintain an optimal posting rhythm to maintain the sustainability of engagement. However, these results also show that increasing frequency without visual quality will not result in significant engagement, supporting the finding of Ashley & Tuten (2015) that content quality remains a key determinant.

#### **4.4. Respondent Behavior and Audience Characteristics**

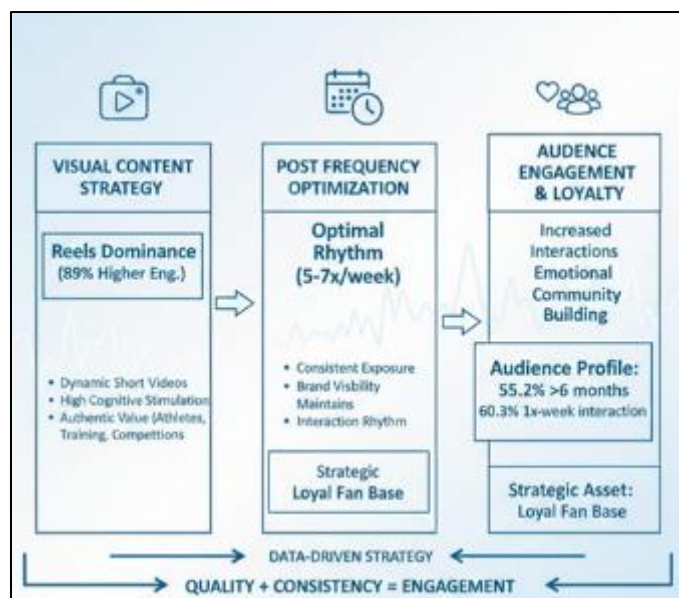
Respondents' profiles show that most followers have been following the account for more than six months (55.2%), and 60.3% interact at least once a week. This indicates that Persani East Java has a stable audience base and tends to be loyal. Audience loyalty is an important factor in long-term engagement, especially in the context of sports organizations that rely on community as a key element of their digital ecosystem (Williams & Chinn, 2016; Yoshida et al., 2014). However, 39.7% of respondents were in the interaction category above three times a week, indicating a great opportunity to increase intensive engagement. Improving the quality of content, storytelling, and two-way interaction can strengthen brand proximity to the audience as recommended by Pronschinske et al. (2012), especially on community-based sports accounts.

#### **4.5. Consistency Between Quantitative Findings and Secondary Data**

Data triangulation shows strong consistency between primary data and secondary data. The finding that visual content had a significant influence was reinforced by the highest performance of the reels during the three months of observation. Similarly, the optimal posting frequency was identified on a pattern of uploads 5–7 times per week, which is in line with the secondary engagement data. This consistency shows that the research findings are not only statistically valid but also empirically relevant in the operational context of Persani East Java. According to Hair et al. (2019), Consistency between primary and secondary data indicates that the research model has good stability and predictive power. This finding also strengthens the potential for practical implementation that can be applied directly in the digital strategy of Persani East Java.

#### **4.6. Implications for Sports Social Media Management**

The research findings have important implications for the social media management of sports organizations. First, high-quality visual content needs to be a top priority in Persani East Java's social media strategy, especially reels-based content. Second, the consistency of posts in optimal frequencies needs to be maintained to ensure continuous exposure. Third, organizations need to understand the characteristics of loyal audiences as strategic assets in creating long-term engagement. The literature states that sports organizations that are able to build emotional and authentic relationships through social media tend to improve brand image and community engagement (Lim & Rasul, 2022). Thus, the results of this research can provide a strong foundation for the formulation of data-based digital strategies.



**Figure 3** Perfecting Instagram engagement: the PERSANI East Java framework

## 5. Conclusion

Visual content and post frequency have a significant effect on engagement on the Persani East Java Instagram account. Visual content is the most powerful factor that increases interaction, especially through the reels format, which consistently records the highest engagement compared to photos, videos, and stories. This shows that visual quality and content appeal are key to building audience response. The frequency of posts also has a positive influence, where the rhythm of uploads 5–7 times per week has been proven to be able to maintain account exposure and encourage user interaction. Nonetheless, the results show that high frequency is not enough without good content quality, so the two need to be in balance.

In addition, the respondent's profile shows that the majority of followers are loyal audiences and have followed the account for a long time. This is an important capital for Persani East Java to develop a more effective and interactive content strategy. Overall, this study confirms that engagement optimization requires a combination of engaging visual content and consistency in upload frequency.

## Compliance with ethical standards

### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

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