Exploring content curation strategy for user-generated Instagram photos: The case of U.S. state DMOs

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1. Introduction

Content curation, defined as the process of gathering, organizing, and presenting content in a meaningful way (Dale, 2014), has been recognized as a crucial marketing strategy over the past decade (Berman & Katona, 2020). Social media platforms facilitate content sharing, requiring marketers to strategize on the use of user-generated content. This is particularly relevant for destination marketing organizations (DMOs) using Instagram, which has over two billion monthly active users (Instagram, 2024). Because of this, the majority of DMOs maintain Instagram accounts and consider it their primary content distribution platform (CrowdRiff, 2024).

Instagram is predominantly a photo-sharing platform. Thus, not surprisingly DMOs use this channel to publish a great number of photos in order to develop or enhance distinctive destination images (Bregoli, 2013). Instagram posts with photos play a vital role in shaping travelers' perceptions of destinations (Arefieva et al., 2021). Importantly, nearly 80% of photos on Instagram are user-generated (Linearity, 2023). These user-generated photos are perceived as authentic and have a significant influence on tourists' destination choices (J. M. Lam et al., 2020). Recognizing the influence of user-generated photos (Llodrà-Riera et al., 2015), many DMOs have integrated these photos into their official stream of Instagram posts (WorldBank, 2018). While this integration of user-generated photos on social media is beneficial (N. Li et al., 2023), it remains unclear which strategy for curating user-generated photos is most effective.

Given the amount and topic diversity of photos posted on Instagram (J. M. S. Lam et al., 2020), DMOs face crucial decisions regarding their user-generated photo curation strategy, particularly in terms of curation intensity (i.e., the extent to which user-generated photos are used) and content alignment (i.e., the extent to which user-generated photos are aligned with DMO-generated photos). This study seeks to address the following questions: How do user-generated photo curation strategies vary across U.S. state DMOs on Instagram? How have these strategies evolved? Which curation strategies are more effective?

By analyzing Instagram data from 50 U.S. state DMOs from 2013 to 2023, this study shows that DMOs adopt varying degrees of curation strategies, with those implementing both high curation intensity and high content alignment achieving optimal user engagement. This study contributes to the destination marketing literature with critical insights into social media content curation strategy. The findings also provide actionable insights for destination managers to strategically integrate user-generated photos into their Instagram marketing campaigns.

2. Research background

2.1 Content Curation in Destination Marketing

Content curation encompasses both internal knowledge re-organization (Leonardi, 2017) and external content integration (Ho et al., 2020); (Zhao & Agyeiwaah, 2024). With the rise of social media, user-generated content has become one of the important external sources for content curation, influencing customers' decision-making processes (Bigne et al., 2021).

From a communication perspective, content curation is important for destination marketing. First, content generated by DMOs interacts with user-generated content in influencing the perception of potential tourists on the destination (Stepchenkova & Zhan, 2013). User-generated content expands DMO's projected destination image by introducing new topics (Tomaž & Walanchalee, 2020). Integrating user-generated content on official DMO materials can project a comprehensive destination image and unique market position (Y. Li et al., 2023). Second, user-generated content is considered more credible than marketer-generated content. Based on signaling theory, DMOs demonstrate destination quality and attractiveness through photos on social media as signals to potential tourists (Rodríguez et al., 2020). As such, curating user-generated content enhances authenticity and increases the credibility of these signals. Third, based on the uses and gratifications theory (Ruggiero, 2000), DMOs can provide value to target tourist groups and attract their attention by curating user-generated content that matches tourists' interests (Dolan et al., 2019). Several studies support the integration of user-generated content into DMOs' marketing materials (Marder et al., 2021; Zhao & Agyeiwaah, 2024).

2.2 DMO's photo-related content strategy

Photos evoke emotions and transcend language barriers, making them powerful for engaging diverse audiences (Deng & Li, 2018). DMOs present photos with pre-determined marketing focus to capture potential travelers' interests (He et al., 2022). Research on DMO photo-related strategies has explored both macro-level approaches, such as storytelling and account aesthetics (Bazi et al., 2023; Lund et al., 2018), and micro-level approaches, focusing on individual post attributes like color schemes and information types (Kanuri et al., 2018; Kim et al., 2015).

Instagram is a crucial channel for destination marketing, offering DMOs a visually-driven platform to curate photos (Cohen et al., 2022). To facilitate curating user-generated photos, DMOs often establish official hashtags and content-sharing policies in their Instagram profiles, as marked in Figure 1.

Figure 1. Example of a DMO Instagram profile page with guidelines to "submit" a post for consideration to be shared by the DMO

If a photo is selected for curation, DMOs attribute to the original creators by tagging their Instagram user handles in their posts (see Figure 2).

Figure 2. Example of a curated Instagram post by a DMO

DMOs make strategic decisions across multiple dimensions when curating user-generated photos. Quantity and content of user-generated photos are crucial in forming a destination image (Stepchenkova & Zhan, 2013; Wang et al., 2021). This study thus focuses on two dimensions: First, *curation intensity* indicates the proportion of curated user-generated photos to all photos on the DMO Instagram account. DMOs pursuing high curation intensity prioritize authenticity, as user-generated content provides authentic tourist experiences (Filieri et al., 2015). DMOs pursuing a low degree of curation intensity focus on establishing authority through their original content, which demonstrates their expertise and commitment to tourists (Volgger & Pechlaner, 2014). Both authenticity and authority contribute to marketing material credibility. In the context of DMO Instagram accounts, DMOs need to balance between user-generated photos for authenticity and their own content for authority.

The second dimension is *content alignment*, which indicates the similarity of user-generated photos with DMO photos. Visual elements (e.g., natural landscapes, animals, human activities, etc.) are pre-determined by DMOs to reflect key aspects of the destination image they aim to project. DMOs pursuing high content alignment focus on strengthening the consistency of marketing materials by selecting user-generated photos that reinforce the projected destination image (García-Carrión et al., 2024). DMOs pursuing low content alignment prioritize variety in the destination image that can appeal to diverse potential tourists (Legohérel et al., 2015). This study focuses on these two dimensions, i.e., curation intensity and curation alignment, in order to describe and assess DMOs' content curation practice as well as its effectiveness.

3. Methodology

3.1 Data collection and preprocessing

This study analyzes 144,418 photos from official Instagram accounts of 50 U.S. state DMOs posted between January 2013 and December 2023. Most state DMOs began using Instagram in 2013, providing a basis for comparison. The data was collected via web scraping using Python's requests library, extracting photo files, descriptions, tags, and comments.

User-generated content on official DMO accounts was identified when a user handle with an @ was present. We checked the accounts for each user handle and excluded a post if the account was identified as a tourism-related business (e.g., a hotel or restaurant) (see Figure 3). We eliminated 8,357 such business-generated photos to retain 27,316 user-generated photos. Posts mentioning no external accounts were classified as DMO photos.

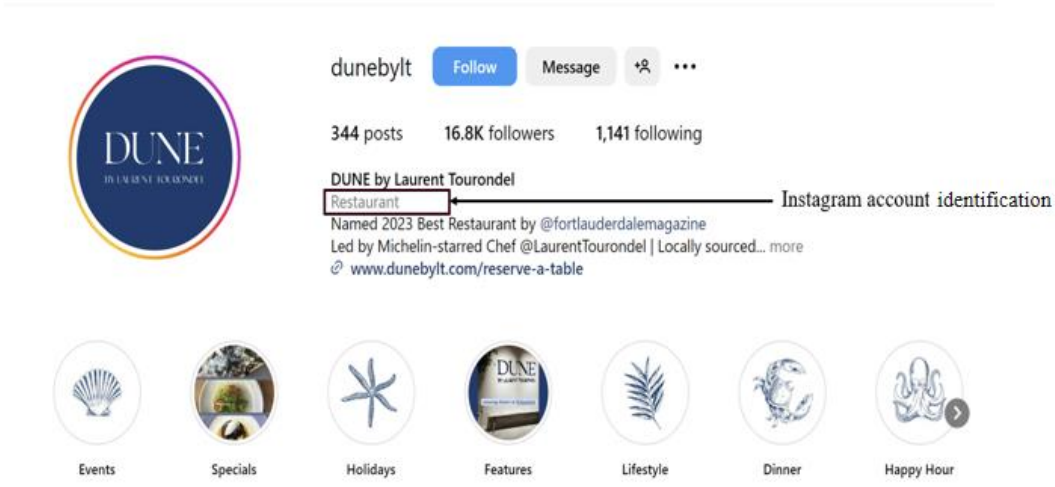

Figure 3. Example of verified business type on user account page

Our dataset consists of the unique photo ID, photo file, corresponding DMO's name, posting date, comments (including posting date), and photo description. Since DMOs select photos in order to convey their overall destination image (Lojo et al., 2020), we aggregated the Instagram photos into monthly panel data. This time window was chosen because nearly 80% of posts receive all comments within the first 30 days of posting (see Figure 4). Monthly aggregation thus captures the majority of the engagement activity.

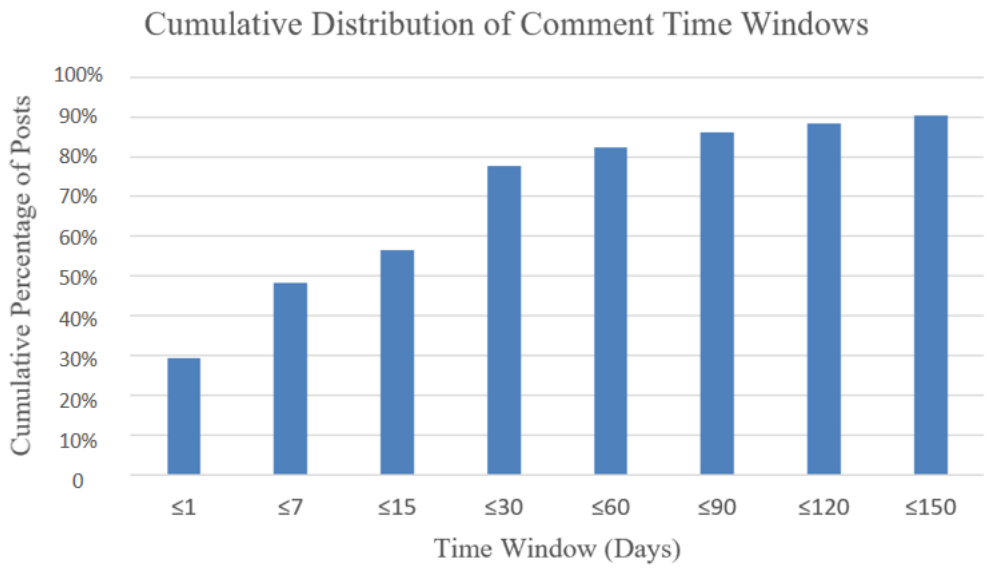

Figure 4. Cumulative Distribution of Comment Time for all Posts

3.2 Measurement

Curation intensity was measured by calculating the ratio of user-generated photos to the total remaining photos (after excluding business-generated content) posted per month for each destination. **Content alignment** was calculated through a two-step approach combining deep learning and cosine similarity analysis. First, we used the Recognize Anything model (Zhang et al., 2024), an open-source computer vision model implemented in Python, to automatically label each photo with noun words and accuracy score, as shown in Figure 5. To ensure reliability, only labels with accuracy scores above 90% were retained.

Figure 5. Example of photo content label

These labels were then embedded using the Word2Vec model to transform each label into a multi-dimensional vector. For each photo, the mean of the label vectors was calculated to obtain a centroid vector, representing the overall semantic meaning of the photo.

To quantify content alignment, the pairwise cosine similarity scores were calculated between the centroid vectors of DMO photos and user-generated photos for each month for each destination. Cosine similarity is a widely used measure of semantic similarity (Berger et al., 2020; Y. Li et al., 2023). The higher the cosine similarity value, the more semantically similar the centroids are. The monthly alignment score for each destination was calculated as the mean of all pairwise cosine similarity scores. This approach captures the overall semantic alignment between DMO photos and user-generated photos for each month. Thus, our unit of analysis are monthly postings on DMO accounts.

3.3 Analysis methods

To answer the research questions, data analysis involved three steps. The first step aimed to show the evolution of content curation strategies. The second step focused on identifying strategic choices. To do this, we classified DMOs into four strategic types based on the medians of curation intensity and content alignment. The third step examined the relationship between curation strategies and user engagement, defined as the degree of involvement that users exhibit toward a brand or content on social media platforms (Habibi et al., 2014). Engagement actions, such as likes, comments, and shares (Schivinski et al., 2016), are key indicators of social media marketing success (Cheng et al., 2020). The number of comments is highly correlated with other engagement actions (Khan, 2017), making it a reliable indicator of overall user engagement. To exclude the influences of other months, we only include comments with timestamps sharing the same month with the photo's post time. Due to the lack of time stamps for likes in our dataset, likes were not included in the analysis.

We conducted an Analysis of Variance (ANOVA) to identify which strategic type performs best for the number of comments. To account for potential temporal effects, we included yearly dummy variables in our analysis.

4. Results

4.1 Evolution of Content Curation Strategies

Figure 6 illustrates the changes in content curation strategies for all 50 DMOs from 2013 to 2023. To create this figure, we aggregated the data across all 50 DMOs at the monthly level. Curation intensity increased rapidly from 2013 to 2017, followed by small fluctuations and a gradual increase through 2023, while content alignment showed an upward trend before 2020 and a slight decline afterward. These trends suggest that U.S. state DMOs have increasingly adopted user-generated photo curation on Instagram as a marketing strategy, initially focusing on reinforcing their projected destination image and then introducing more variety in destination representation.

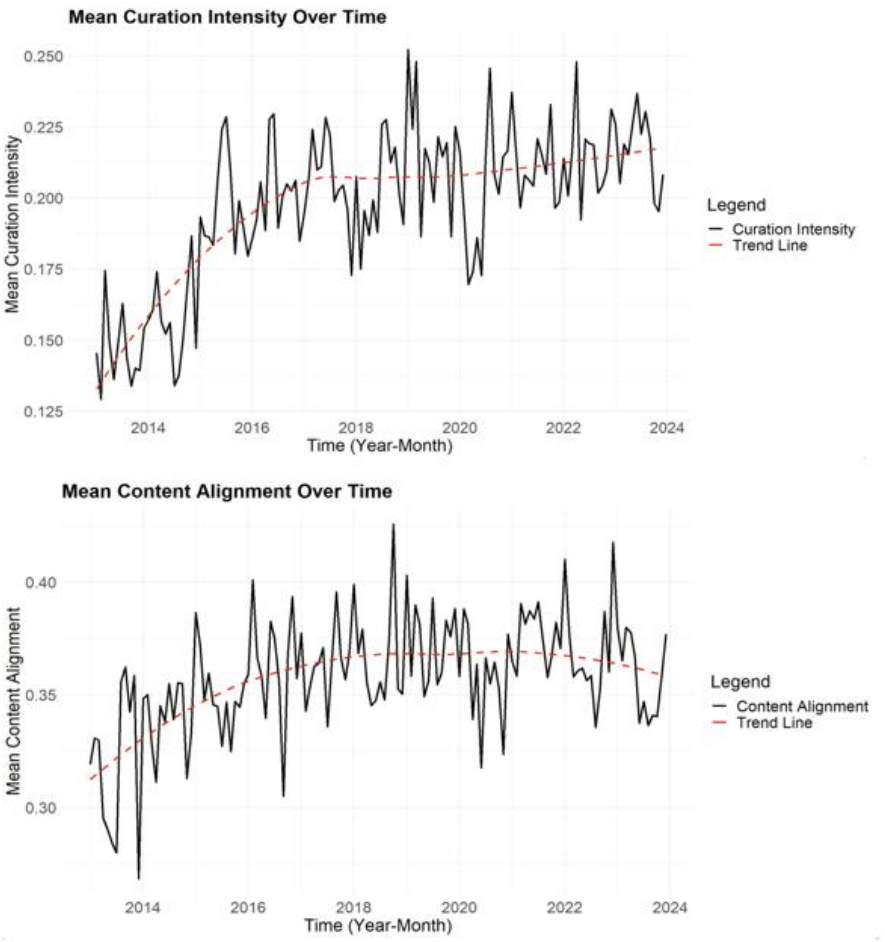

Figure 6. Changes in curation intensity and content alignment over time

4.2 DMOs Content Curation Types

Heatmaps in Figure 7 illustrate the strategic position of DMOs regarding content alignment and curation intensity. The red dotted lines divide the DMOs each year into four categories, representing four distinct strategic types. From 2013 to 2020, high curation intensity combined with high content alignment gradually emerged as the predominant strategy type for U.S. state DMOs. After 2020, DMOs shifted towards either high curation intensity with low content alignment or low curation intensity with high content alignment strategies. Only a small number of DMOs implemented low curation intensity with low content alignment strategy.

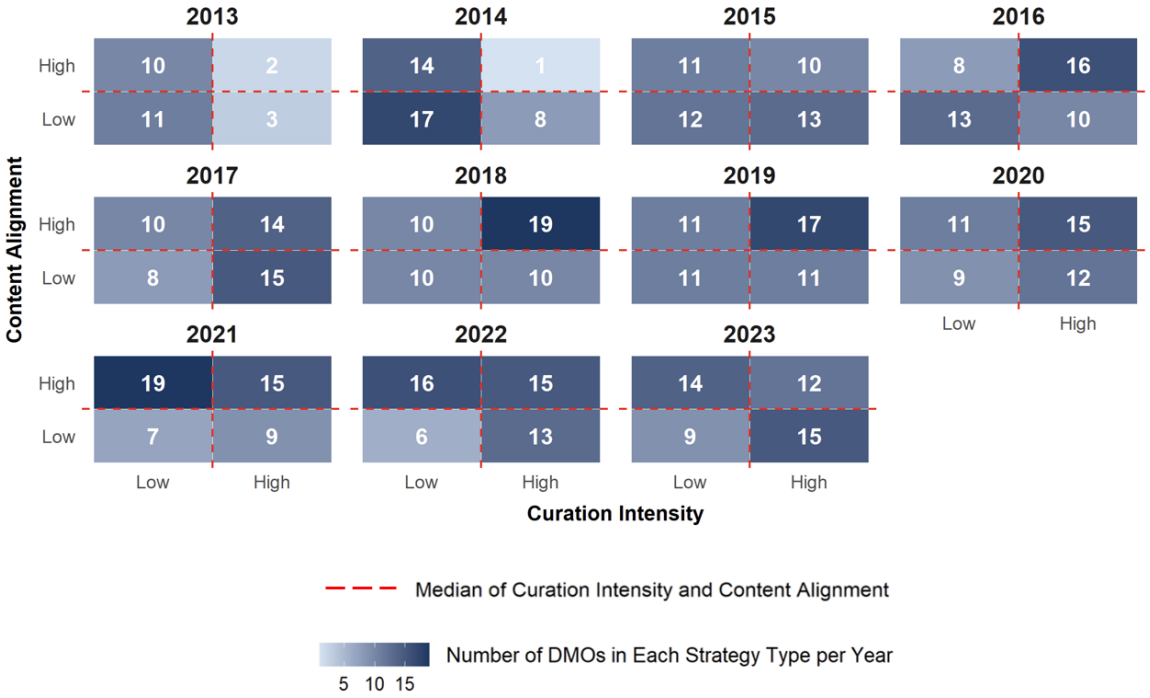

Figure 7. Heatmap of DMO Strategic Distributions Over Time

4.3 The relationship between curation strategies and user engagement

Table 1 presents the results of the ANOVA analysis, examining the effects of strategy types and time periods on the number of comments. The analysis reveals significant differences in the number of counts across different strategic types ($F = 10.371$, $p < 0.001$). Table 2 shows the mean number of comments for each strategic type.

Table 1 ANOVA analysis result (number of comments)

Factor	Df	Sum Sq	Mean Sq	F-value	p-value	Significance
Strategy Types	3	6498	2166.0	30.307	< 2e-16	***
2013	1	1457	1457.4	20.392	8.30e-06	***
2014	1	1465	1464.6	20.493	7.89e-06	**
2015	1	580	579.6	8.110	0.00463	
2016	1	176	176.1	2.464	0.11729	**
2017	1	533	532.7	7.453	0.00661	
2018	1	0	0.1	0.001	0.97321	
2019	1	1	1.1	0.016	0.89968	
2020	1	161	161.4	2.259	0.13366	
2021	1	444	444.3	6.217	0.01305	*
2022	1	5	5.4	0.075	0.78390	
Residuals	403	28802	71.5			-

$*p \leq .05$, $**p \leq .01$, $***p \leq .001$.

Table 2 Mean Number of Comments by Strategy Types

Strategy Categories	Mean Comment Count	SD Comment Count	N
High Curation Intensity-High Content Alignment	18.315652	9.821016	101
High Curation Intensity-Low Content Alignment	13.707099	9.974148	108
Low Curation Intensity-High Content Alignment	11.221832	8.838293	108
Low Curation Intensity-Low Content Alignment	7.250809	7.089718	100

The results show that DMOs adopting high curation intensity with high content alignment generated the highest mean number of comments (Mean = 16.605), followed by those with high curation intensity but low content alignment (Mean = 13.804). DMOs with low curation intensity achieved fewer comments, with those maintaining high content alignment receiving more comments (Mean = 10.639) than those with low content alignment (Mean = 6.389). This suggests that the combination of high curation intensity and high content alignment produces the most effective results in terms of generating user engagement.

5. Conclusion and Discussion

This study has three key findings about the user-generated photo curation strategies pursued by U.S. state DMOs on Instagram. First, DMOs have gradually adopted the curation of user-generated photos as a marketing strategy, showing increasing levels of both curation intensity and content alignment from 2013 to 2023. Second, DMOs show varying degrees of strategic implementation. Third, combining high curation intensity with high content alignment seems to generate the highest user engagement.

This study makes several contributions. First, it enriches destination marketing literature by exploring how DMOs' user-generated photo curation strategies enhance marketing effectiveness. By examining the evolution and impact of different curation strategies, we provide insights into how DMOs can effectively leverage social media for destination promotion. Second, this study contributes to social media marketing literature by exploring the role of user-generated content in official DMO marketing materials. Finally, this study provides practical guidance for DMOs in crafting social media strategies, highlighting the importance of integrating user-generated content into official marketing materials. The results suggest that DMOs should curate a large number of user-generated photos that align with their projected destination image to maximize engagement. A limitation and avenue for future research is that current technologies are not able to identify AI generated photos.

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