

Know Your Users via Image Analytics Before Developing Posts: Data-Driven Optimization Framework to Enhance Social Media Engagement

Should companies use AI to study their photos before posting on social media, and how many "extra" details should be in a photo to get likes, comments, or shares?

This study by Subodha Kumar and colleagues, published in *Management Science*, looks at how the objects inside a company's Instagram and Facebook photos affect how much people interact with those posts. Every image has a "main" feature (like a couch in a furniture ad) plus "extra" features that add detail (like a vase or a plant in the background). Using deep learning tools that automatically detect objects in photos, the researchers studied 100 posts each from Instagram and Facebook to see how the number of extra features relates to likes, shares, and comments. They then built a mathematical model to help companies decide how many extra features to include, given a limited marketing budget.

The findings show that more extra features isn't always better, and the ideal number depends on the platform. On Instagram, likes go up as more extra features are added but only up to a point (around 7–8 extra features), after that, engagement drops. On Facebook, it works the opposite way: more extra features consistently lead to more shares and comments, up to the maximum allowed. The researchers also found that posting more often, using longer captions on Instagram (but shorter ones on Facebook), and using less color-saturated images, all boost engagement. Companies that base their social media budget only on which platform has more users can lose out on up to 15% of possible engagement, since it's more effective to also factor in analytics costs and the specific way each platform's audience responds to images.

MAJOR TAKEAWAYS:

- The relationship between "extra" image details and engagement is not a straight line
- Adding extra features to images boosts engagement by about 5% on Instagram and 16% on Facebook.
- Deciding how to spend a marketing budget based only on a platform's number of users can lead to weaker results than accounting for costs and engagement patterns too.

WHO NEEDS TO KNOW:

- Social media managers and marketers
- Small business owners advertising online
- Researchers in marketing and operations management

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