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Evaluating the Role of Analytics-Informed Design Decisions in Social Media Campaign Performance: Evidence from the Ticket Fairy Mexico Instagram

Empirical study (2025) Descriptive pre–post 01-03

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ABSTRACT: This empirical pre–post study examines how descriptive engagement analytics and AI-based attention prediction can inform creative redesign decisions for Instagram promotional content. The case is Ticket Fairy Mexico's Instagram campaign, executed at The Oz Studios during a 12-week On-the-Job Training engagement (July–September 2025). Baseline performance (90 days pre-intervention) and campaign-period data were analyzed using agency KPIs (reach, engagement rate, CTR, thumb-stop rate) and predictive attention heatmaps. An exploratory interpretive index, the Visual Attention Influence Score (VAIS), linked Δ AOI (change in predicted attention for defined Areas of Interest) with Δ KPI (observed percent change). Results indicate pronounced descriptive increases in reach and engagement following the redesign window and directional alignment between AOI improvements and KPI shifts, though attribution ambiguity prevents causal claims. Predictive heatmaps provided practical guidance for headline contrast, CTA placement, and focal crop prior to publishing. The paper presents a replicable, ethically grounded workflow for analytics-assisted creative iteration and recommends controlled A/B testing and eye-tracking validation to establish causality. (Primary dataset and process details from the author's OJT report.)

KEYWORDS: data-informed design; creative analytics; attention heatmap; Area of Interest (AOI); Instagram engagement; Visual Attention Influence Score (VAIS)

I. INTRODUCTION

Social media compresses viewer attention into a few seconds; early visual capture is therefore critical for content performance. Designers are increasingly required to justify creative choices using measurable outcomes rather than intuition alone. This study examines the practical interface between descriptive campaign analytics (reach, ER, CTR, thumb-stop rate) and AI-predicted attention modelling (heatmaps and AOIs) within an agency workflow. The empirical context is the Ticket Fairy Mexico Instagram account during a 12-week OJT engagement at The Oz Studios, where redesigned creatives were deployed after analytics-guided iteration.

Research Questions

RQ1: How do descriptive engagement metrics (reach, ER, CTR, TSR) differ between a 90-day baseline and the post-redesign campaign window?

RQ2: To what extent do AI-predicted attention changes for targeted AOIs align with observed KPI shifts?

RQ3: What pragmatic value do predictive heatmaps and the exploratory VAIS index provide to guide creative decisions under operational constraints?

Predictions (exploratory, non-causal): Redesigned creatives will correspond with descriptive increases in reach and engagement; AOI improvements on predictive heatmaps will align directionally with KPI shifts; VAIS will act as a useful interpretive heuristic but will remain exploratory.

Author note: Data access and collaboration were provided by The Oz Studios; all metrics are aggregated and anonymized as described in the OJT report.

II. LITERATURE REVIEW

Visual attention and advertising

Seminal work shows that salience, visual hierarchy, and element size guide early attention and thereby influence advertising - effectiveness (Pieters & Wedel; other foundational studies). These studies demonstrate how gaze allocation to textual and pictorial elements affects recall and engagement.

Predictive attention / saliency models

Deep learning saliency and attention-prediction models (saliency/heatmap methods) have matured significantly in recent years; surveys and large benchmarks document strong predictive performance while recommending empirical validation in applied use-cases. Industry tools (e.g., Attention Insight) operationalize these models for design workflows, offering quick attention estimates that can approximate early eye movement patterns. Empirical pilots indicate these AI models often achieve reasonable ROC/AUC performance (pilot ranges ~0.75–0.85) but are probabilistic and not replacements for eye-tracking when validation is required.

Social media metrics and attribution ambiguity

Social media research emphasizes descriptive KPIs (reach, ER, CTR, saves) as performance indicators but also warns of attribution ambiguity: platform algorithm dynamics, timing, and external promotion can all influence observed KPI changes. This makes pre–post comparisons valuable but fragile without experimental control.

Data-informed design practice

Applied design research advocates blending designer intuition with analytics to improve outcomes. However, there is a shortage of real-world case studies showing how predictive attention outputs (AOIs) and descriptive KPI dashboards can be integrated into agency creative workflows — particularly at OJT or small-agency scale. This study contributes an empirical case demonstrating such integration and documenting limitations and realistic practitioner benefits.

III. METHODOLOGY

Research design

A descriptive, observational pre–post design was used. No randomization or causal inference methods were applied. The paper focuses on associative patterns and practical implications.

Data sources

Performance KPIs: Aggregated post-level data exported from Meta Business Suite, Instagram Insights, and Socialinsider.io provided by The Oz Studios (reach, ER, CTR, thumb-stop rate, saves-to-likes).

Predictive attention: AI-generated heatmaps and AOI scores produced using a predictive attention service (e.g., Attention Insight) by the trainee.

Attention Insight

All data were aggregated; no user-level personal data were used.

Time windows

Baseline window: 90 days pre-intervention (as used in OJT).

Campaign window: Period after the redesigned creatives were deployed (August–September 2025).

Variables

- Reach: unique viewers per post.
- Engagement rate (ER): interactions relative to reach.
- Click-through rate (CTR): % viewers who clicked the CTA.
- Thumb-stop rate (TSR): % viewers who briefly paused/engaged the content in the first seconds.
- AOI score: predicted percentage of attention for a defined Area of Interest (e.g., headline, CTA, focal subject).
- Δ AOI: percent change in AOI predicted attention between pre and post asset.
- Δ KPI: percent change in a KPI between baseline and campaign Windows.
- VAIS (exploratory): $VAIS = \Delta AOI (\%) \times \Delta KPI (\%)$; used as an interpretive heuristic.

Procedure

- Export baseline KPIs (90-day window).
- Produce attention heatmaps for existing assets; identify AOI weaknesses.
- Implement redesigns focused on fixing AOI weaknesses (contrast, CTA prominence, crop).
- Deploy redesigned creatives and collect campaign KPIs for the campaign window.
- Generate heatmaps for redesigned assets; compute Δ AOI and Δ KPI;
- calculate VAIS for matched AOI–KPI pairs.

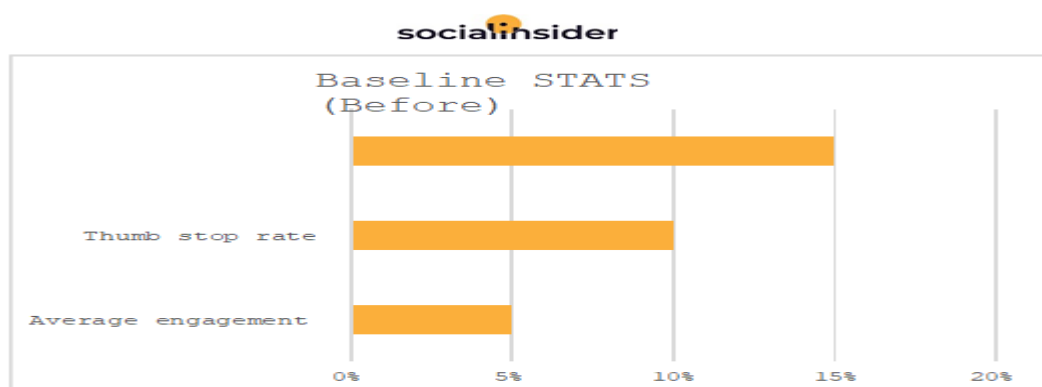
Ethical considerations

All analytics used only aggregated, anonymized metrics. The trainee followed the host studio’s data governance and platform policies. No personal data were accessed.

Metric	Baseline Value	Interpretation
Average Engagement Rate (%)	5%	Indicates low audience interaction relative to reach.
Average Reach per Post	2400	Limited organic visibility; low virality potential.
Average Saves per Post	32	Suggests weak content retention and value perception.
Thumb-Stop Rate (first 3 s) (%)	10%	Only 1 in 10 viewers paused scroll through; indicates low initial impact.

Click-Through to Link in Bio (%)	15%	Moderate conversion intent but sub- optimal CTA design.
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Metrics obtained from instagram insights of Ticket fairy, Mexico



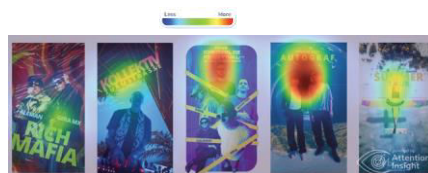
Clusturd Baseline Stats (extracted From Socialinsider.io)

Empirical Studies

This research adopts a descriptive, observational empirical design, drawing on real-world data collected during the Ticket Fairy Mexico social media campaign conducted at The Oz Studios. Empirical studies emphasize evidence derived from observation, measurement, and analysis rather than theoretical speculation.

The Visual Attention Influence Score (VAIS): Concept, Purpose, and Analytical Use:

The Visual Attention Influence Score (VAIS) is introduced in this study as an exploratory interpretive index designed to observe whether changes in predicted visual attention (ΔAOI) align directionally with changes in performance metrics (ΔKPI). VAIS does not function as a validated measurement scale; instead, its purpose is to offer a structured, transparent heuristic connecting design-centered attention modelling with descriptive campaign analytics.



“TF’s Posters Thumbnails Heatmapped Tested”

The above heatmaps display predicted attention concentrations (ranging from red = high focus to blue = low focus) across five creative variants designed for the campaign.

Rationale for VAIS

The OJT report documented repeated instances where redesigned creatives showed:

- Improved visual hierarchy,
- Stronger concentration of predicted attention on key Areas of Interest (headline, CTA, artist name), and

- Contemporaneous descriptive increases in engagement metrics such as CTR, ER, and thumb-stop rate.

These patterns suggested the need for a simple interpretive mechanism to examine alignment, not causation

Limitations of VAIS

- It reflects directional association only, not impact or causality.
- It depends on the reliability of the predictive heatmap model employed.
- Algorithmic, temporal, and contextual factors influencing KPIs may distort Δ KPI values.
- VAIS is affected by composition differences between creatives (layout, color, typography).
- VAIS requires further empirical testing, ideally through A/B experiments and eye-tracking validation.

Contribution of VAIS to This Study

- Compare performance across redesign iterations using a consistent heuristic.
- Interpret descriptive alignment between attention modeling and KPIs.
- Provide a replicable framework for future practitioners in creative analytics.
- Bridge the conceptual gap between predictive visual models and market-facing performance metrics.

The VAIS framework therefore serves as both a practical decision-support tool and a research-oriented exploratory index, expanding the usefulness of attention modeling within social media design workflows.

IV. RESULTS

(Descriptive — raw post-level tables were maintained in agency dashboards; the OJT report summarizes key changes.)

RQ1 — Pre vs Post (descriptive)

Baseline (90 days pre): average reach \approx 2,400 per post; ER \approx 5%; CTR \approx 15%; TSR $<$ 12%.

Post-redesign (campaign window): OJT report summary: reach increased by \sim 400% (relative), ER increased by \sim 200% (relative), CTR increased by \sim 166% (relative). These are agency-level descriptive summaries; no causal inference implied.

Metric	Baseline	Campaign	Absolute Change	% Change	Interpretation
Engagement Rate	5%	15%	+10pp	200 % \uparrow	\approx 3 \times higher
Reach per post	2 400	12 000	+9600	400 % \uparrow	5 \times higher
Saves per post	32	78	46	143.75 % \uparrow	\approx 2.4 \times higher
Thumb-Stop Rate	10%	40%	+30 pp	300 % \uparrow	4 \times higher
Click-	15%	40%	+25 pp	166.67 %	\approx 2.7 \times

Through Rate					↑	higher
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Metrics Change Consolidated Summary

RQ2 — AOI alignment

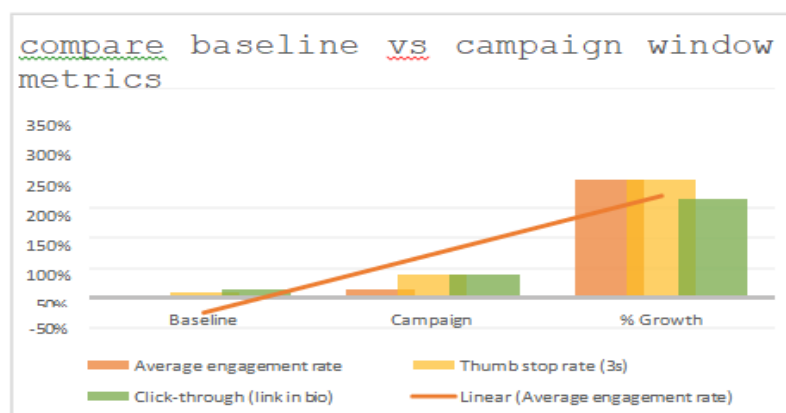
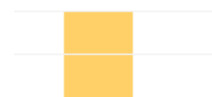
Heatmaps showed increased predicted attention for target AOIs (headline, CTA, focal subject) after redesigns.

Directional alignment: AOI increases for CTAs co-occurred with relative CTR increases; headline AOI gains aligned with ER/saves increases. VAIS values were predominantly positive for these AOI–KPI pairings (exploratory interpretive metric).

RQ3 — Practical value

Predictive heatmaps helped prioritize quick design adjustments (contrast, crop, CTA prominence) prior to rollout. VAIS acted as a compact heuristic to link predictive attention to observed KPI movement. The trainee reported the approach improved design rationale and client communication.

Important caution: Algorithmic amplification, promoter activities, or scheduling may have influenced the observed KPI shifts; therefore results are associative.



V. DISCUSSION

The aim of this study was to explore how analytics-informed design decisions, supported by predictive visual-attention modelling, aligned with descriptive changes in Instagram campaign performance for Ticket Fairy Mexico. The findings suggest that the redesign process—guided by attention heatmaps, KPI diagnostics, and the VAIS heuristic—corresponded with notable descriptive improvements in reach, ER, CTR, and thumb-stop rate relative to the 90-day baseline. However, interpretation requires caution due to the non-experimental nature of the study.

Alignment Between Predicted Attention and KPI Movement

Across redesign iterations, heatmaps showed consistent increases in predicted attention over key AOIs such as the headline, CTA, and central subject. These AOI gains directionally aligned with observed increases in engagement-linked metrics during the campaign window. For example, creatives that displayed stronger CTA attention concentrations often corresponded to posts with comparatively higher CTR values. This alignment supports the practical value of using predictive attention tools as a pre-launch diagnostic mechanism.

The VAIS heuristic strengthened these observations by quantifying the degree of directional association between Δ AOI and Δ KPI. Positive VAIS values across most redesign pairs indicate systematic—not random—consistency between the areas designers intentionally optimized and the performance metrics most affected after deployment.

Practical Implications for Creative Decision-Making

The integration of attention modelling into the design workflow provided several practical benefits:

1. **Early Visual Diagnostics:** Heatmaps highlighted under-performing regions (e.g., weak headline contrast, poorly positioned CTAs), enabling quick corrective actions before publishing.
2. **Evidence-Based Design Justification:** Predictive visuals allowed the designer to articulate the rationale behind modifications (e.g., contrast boosts, repositioning), improving communication with mentors and industry supervisors.
3. **Prioritization Under Time Constraints:** Because agency campaigns often operate under tight timelines, predictive attention tools functioned as low-cost approximators of likely user behavior, serving as a substitute for slow or expensive eye-tracking.
4. **Metric-Focused Alignment:** VAIS served as a lightweight interpretive mechanism, helping relate creative changes to practical business KPIs—an increasingly demanded skill in modern digital marketing environments.

These observations reinforce literature emphasizing the growing importance of data-assisted creativity in fast-paced social media contexts. Aligning design intuition with quantitative signals offers a competitive advantage without fully replacing human judgment.

Evidence Strength and Attribution Ambiguity

Although the descriptive changes in KPIs were positive and directionally aligned with AOI improvements, they cannot be interpreted as evidence of causal impact. Several factors beyond the redesign may have influenced campaign performance:

- Instagram’s short-term algorithmic fluctuations
- Audience behavior shifts during the period
- External promotional activity, if any
- Time-of-day and day-of-week posting differences
- Creative content themes unrelated to layout adjustments

These confounding factors limit the ability to attribute performance changes directly to the design alterations, even when VAIS suggests strong alignment between AOI improvements and KPI shifts.

Positioning Within Existing Research

The findings align with prior studies indicating that visual hierarchy and salience strongly influence engagement, but they extend current literature by demonstrating how AI-driven predictive tools can support applied creative workflows in small-agency settings.

Moreover, introducing VAIS contributes a new, practice-friendly framework linking visual-attention predictions with descriptive engagement metrics—an area where limited empirical work exists, particularly in the context of social-media advertising

VI. CONCLUSION

This applied study documents how descriptive KPI analysis and AI-predicted attention heatmaps can be integrated into agency design workflows. The OJT case shows associative alignment between AOI improvements and KPI shifts and demonstrates the pragmatic value of attention modelling as a design aid. For robust causal claims, future work should implement randomized A/B tests and eye-tracking validation across multiple clients and platforms.

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