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Original Research Article

Analyzing Visual Consistency in Amul's Topical Advertisements: An Image Analytics Approach using Orange Data Mining

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Abstract: Amul's topical advertisements represent one of the world's longest-running contextual advertising which is successfully integrating contemporary socio-political, cultural, economic, and sporting events with a distinctive and recognizable visual identity. While previous research has extensively examined advertising effectiveness, consumer engagement, and brand communication, limited studies have quantitatively investigated the visual consistency of topical advertisements using Image Analytics. To address this research gap, the present study proposes a data-driven image analytics framework implemented in Orange Data Mining to analyze visual similarity patterns within a dataset of selected 60 Amul topical advertisements. Deep image embeddings were extracted from each advertisement to capture high-level semantic visual features, which were subsequently analyzed using Euclidean distance computation, distance matrices, hierarchical clustering, k-means clustering, t-distributed Stochastic Neighbour Embedding (t-SNE), and outlier detection. The proposed workflow enables an objective and scalable assessment of visual relationships among advertisements without relying on manual annotation, thereby providing a reproducible methodology for evaluating brand consistency through unsupervised machine learning. The experimental analysis demonstrates that although the advertisements represent diverse contemporary events and creative narratives, they exhibit a high degree of visual consistency through recurring illustration styles, typography, mascot representation, color composition, and layout design. The findings demonstrate the effectiveness of deep image embeddings and unsupervised learning for objectively assessing visual branding strategies. The proposed framework contributes to the growing intersection of computer vision, image analytics, and marketing analytics by providing a scalable and reproducible approach for evaluating visual consistency in advertising campaigns, with potential applications in brand identity assessment, creative analytics, and digital marketing intelligence.

Keywords: Amul Topical Advertisements, Image Analytics, Visual Consistency, Deep Image Embeddings, Orange Data Mining, Brand Identity, Marketing Analytics.

INTRODUCTION

In the digital era, visual communication has become one of the most influential components of brand strategy, enabling organizations to establish distinctive identities, enhance consumer engagement, and strengthen long-term brand recall. Unlike textual communication, visual elements such as illustrations, colours, typography, composition, and graphical layouts can convey messages rapidly while creating emotional connections with audiences. Consequently, maintaining visual consistency across advertising campaigns has emerged as a critical factor in developing strong brand equity and consumer trust (Demšar *et al*., 2013). With the rapid advancement of artificial intelligence (AI) and computer vision, researchers have increasingly adopted image analytics techniques to quantitatively evaluate visual content, moving beyond traditional qualitative methods of advertisement analysis (Bommasani *et al*., 2022). These technological developments have created new opportunities for objectively examining the visual characteristics of advertising campaigns through deep image representations and machine learning algorithms.

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Among India's most iconic advertising campaigns, Amul Topical Advertisements represent one of the world's longest-running examples of contextual advertising. Since the late 1960s, Amul has consistently responded to current affairs, political events, sports, entertainment, social issues, and international developments through humorous illustrations featuring the well-known Amul Girl mascot accompanied by witty slogans. Despite continuously adapting its content to contemporary events, the campaign has remarkably preserved its distinctive artistic style, visual composition, typography, color palette, and branding elements over several decades. This unique combination of creativity and consistency has enabled Amul to establish a highly recognizable visual identity while remaining culturally relevant across generations (Bommasani *et al*., 2022). Although marketing literature has extensively discussed Amul's advertising effectiveness and brand positioning, quantitative investigations of its visual consistency using artificial intelligence remain scarce.

Recent advances in deep learning and computer vision have significantly transformed image analysis by enabling machines to extract high-dimensional semantic features from visual data. Instead of relying on handcrafted image descriptors, modern deep image embeddings generated by pre-trained convolutional neural networks (CNNs) and vision transformer (ViT) models effectively capture complex visual patterns, including texture, shape, object relationships, and overall composition (Dosovitskiy *et al*., 2021; Caron *et al*., 2021). These embeddings provide meaningful numerical representations that facilitate similarity analysis, clustering, visualization, and anomaly detection without requiring manual feature engineering. Consequently, deep image embeddings have become increasingly valuable in applications such as image retrieval, visual recommendation systems, digital marketing, social media analytics, and brand identity assessment (Radford *et al*., 2021; Bommasani *et al*., 2022). The integration of these techniques with visual analytics allows researchers to objectively evaluate large collections of images while minimizing human bias.

Unsupervised machine learning methods further enhance image analytics by identifying hidden structures and relationships within datasets without requiring labelled training samples. Algorithms such as hierarchical clustering and k-means clustering effectively group visually similar images based on feature similarity, while dimensionality reduction techniques including t-distributed Stochastic Neighbour Embedding (t-SNE) enable intuitive visualization of high-dimensional image embeddings in two-dimensional space (Hussain *et al*., 2017; Pedregosa *et al*., 2023). Similarly, Euclidean distance matrices provide quantitative measurements of pairwise visual similarity, and outlier detection algorithms identify advertisements exhibiting distinctive visual characteristics. Together, these techniques offer comprehensive insights into recurring visual patterns, cluster formation, and deviations within advertising datasets. Recent studies have demonstrated the effectiveness of combining deep image embeddings with unsupervised learning for analyzing branding, product design, consumer perception, and visual communication across diverse application domains (Hartmann *et al*., 2021, Chen *et al*., 2024, Philp *et al*., 2022).

Despite these technological advancements, relatively few studies have applied image analytics to evaluate the visual consistency of long-running advertising campaigns. Existing research predominantly focuses on consumer perception, sentiment analysis, advertising effectiveness, or textual content, whereas the visual design itself has received comparatively limited quantitative investigation (Li, Lee, & Blasco-Arcas, 2025). Moreover, most studies employ manual coding approaches that are time-consuming, subjective, and difficult to reproduce. There remains a significant research gap in applying computer vision-based image analytics to objectively assess how brands maintain visual consistency while adapting creative content to evolving real-world events. Given the cultural significance and historical continuity of Amul's topical advertisements, they provide an ideal case for exploring this research problem through unsupervised machine learning techniques.

LITERATURE REVIEW

Table 1:

Reference	Focus of Study	Research Gap Identified	Relevance to the Present Study
Bommasani *et al*., (2022)	Comprehensive review of foundation models and their applications in AI.	Limited discussion on advertising image analytics and brand consistency evaluation.	Provides the AI foundation supporting deep image embeddings used in this study.
Caron *et al*., (2021)	Proposed self-supervised visual representation learning using Vision Transformers (DINO).	Focused on general image representation learning without marketing applications.	Supports robust feature extraction from advertisement images.

Reference	Focus of Study	Research Gap Identified	Relevance to the Present Study
Demšar *et al*., (2013)	Introduced Orange Data Mining as an open-source visual machine learning platform.	Did not explore image analytics for advertising or branding research.	Justifies the analytical platform used in the present study.
Dosovitskiy *et al*., (2021)	Introduced the Vision Transformer (ViT) architecture for image recognition.	Focused on image classification rather than visual branding analysis.	Provides the theoretical basis for deep image embedding techniques.
Du (2025)	Applied image analysis and object detection to optimize advertisement design.	Emphasized advertisement optimization rather than longitudinal visual consistency.	Demonstrates AI applications in advertisement image evaluation.
Goodfellow *et al*., (2016)	Presented the foundations of deep learning and neural network architectures.	General AI framework without branding-specific applications.	Provides theoretical support for deep learning methods used in image analytics.
Ha *et al.,* (2021)	Applied deep learning to detect image–text mismatch in Instagram advertising.	Focused on multimodal consistency rather than visual branding consistency.	Demonstrates AI applications in advertising image analysis.
Hartmann *et al.,* (2021)	Examined the influence of visual content on brand communication and consumer engagement.	Focused on consumer-generated images rather than organizational advertising campaigns.	Reinforces the importance of visual elements in branding research.
Hussain *et al*., (2017)	Developed deep learning methods for semantic understanding of advertisement images.	Did not investigate visual consistency across advertising campaigns.	Provides methodological support for AI-based advertisement image analysis.
LeCun *et al*., (2015)	Comprehensive review of deep learning for computer vision and AI.	Broad methodological review without marketing applications.	Supports the deep learning framework employed for image analytics.
Li & Zhang (2024)	Examined computer vision applications in advertising image analysis.	Limited emphasis on long-term brand identity and visual consistency assessment.	Supports the use of computer vision techniques in advertising research.
Li, Lee, & Blasco-Arcas (2025)	Proposed a conceptual framework for computer vision in branding research.	Primarily conceptual with limited empirical validation using advertising datasets.	Establishes the theoretical basis for AI-driven branding analysis.
Pedregosa *et al*., (2011)	Introduced Scikit-learn as a machine learning framework for clustering and classification.	General-purpose machine learning library without branding applications.	Supports clustering algorithms implemented in this study.
Philp *et al*., (2022)	Used computer vision to predict consumer engagement from social media images.	Focused on engagement prediction rather than advertisement similarity analysis.	Demonstrates practical marketing applications of image analytics.
Radford *et al*., (2021)	Introduced CLIP for learning transferable visual representations from image–text pairs.	General computer vision framework with no direct branding application.	Supports semantic image embedding generation used in this research.
Russakovsky *et al*., (2015)	Presented the ImageNet benchmark for large-scale visual recognition.	Focused on object recognition rather than advertisement image analysis.	Provides the foundation for modern deep visual feature extraction.
Van der Maaten & Hinton (2008)	Proposed t-distributed Stochastic Neighbor Embedding (t-SNE) for high-dimensional visualization.	Methodological contribution without marketing applications.	Supports visualization of deep image embeddings generated in this study.

Research Gap:

Existing studies have extensively investigated advertising effectiveness, consumer engagement, brand communication, and digital marketing using AIML. However, limited research has quantitatively examined the visual consistency of long-running advertising campaigns using deep image embeddings and unsupervised image analytics techniques. Moreover, studies on Amul's topical advertisements have primarily adopted qualitative or marketing-oriented approaches, with little emphasis on computational visual analysis. To address this gap, the present study employs Orange Data Mining to analyze the visual consistency of selected 60 Amul topical advertisements using deep image embeddings, Euclidean distance, hierarchical clustering, K-Means clustering, t-SNE visualization, and outlier detection, providing an objective and reproducible framework for evaluating brand visual identity.

Research Objectives

1. To analyze the visual consistency of selected 60 Amul topical advertisements using deep image embeddings in Orange Data Mining.
2. To identify visual similarity patterns and clusters among Amul topical advertisements using unsupervised machine learning techniques.
3. To evaluate the effectiveness of image analytics in assessing long-term brand visual identity and consistency in contextual advertising.

MATERIALS AND METHODS

Research Design

This study adopts a quantitative, exploratory, and image analytics-based research design to investigate the visual consistency of Amul's topical advertisements using artificial intelligence and unsupervised machine learning techniques. The proposed framework utilizes Orange Data Mining, an open-source visual programming platform for data analytics and machine learning, to objectively analyze the visual characteristics of advertisement images. Unlike conventional qualitative content analysis, the proposed methodology relies on deep image embeddings to extract semantic visual information and identify latent similarity patterns among advertisements without manual annotation. The overall workflow integrates feature extraction, similarity measurement, clustering, dimensionality reduction, and outlier detection to evaluate long-term visual consistency.

Dataset Description

The dataset consists of 60 Amul topical advertisements, selected to represent diverse themes including politics, sports, entertainment, business, science, technology, social issues, and international events. All advertisements were collected from publicly available Amul archives and official digital sources in JPEG/PNG format while preserving their original visual quality. Each image represents a unique topical event but follows Amul's characteristic artistic style comprising hand-drawn illustrations, the iconic Amul Girl mascot, humorous headlines, consistent typography, and standardized branding elements. Since the objective of this study is to examine visual consistency rather than textual interpretation, the complete advertisement image was considered as the unit of analysis.

Image Feature Extraction

The first stage of the analysis involved extracting deep visual features from each advertisement using the Image Embedding widget available in Orange Data Mining. The widget employs a pre-trained deep convolutional neural network (CNN) to convert each image into a high-dimensional numerical feature vector (image embedding). These embeddings capture semantic information including illustration style, color composition, spatial arrangement, object relationships, typography, and overall visual appearance. Compared with handcrafted image descriptors, deep image embeddings provide a richer representation of image content by learning hierarchical visual features from large-scale image datasets. Consequently, visually similar advertisements produce feature vectors that are closer in the embedding space, enabling quantitative similarity analysis.

Analytical Framework

The extracted image embeddings were analyzed using multiple unsupervised machine learning techniques available in Orange Data Mining. The overall analytical workflow is illustrated in Figure 1.

Software Environment:

All analyses were conducted using Orange Data Mining, an open-source visual analytics platform that integrates machine learning algorithms through a graphical workflow interface. The software provides reproducible and transparent analytical pipelines without requiring extensive programming.

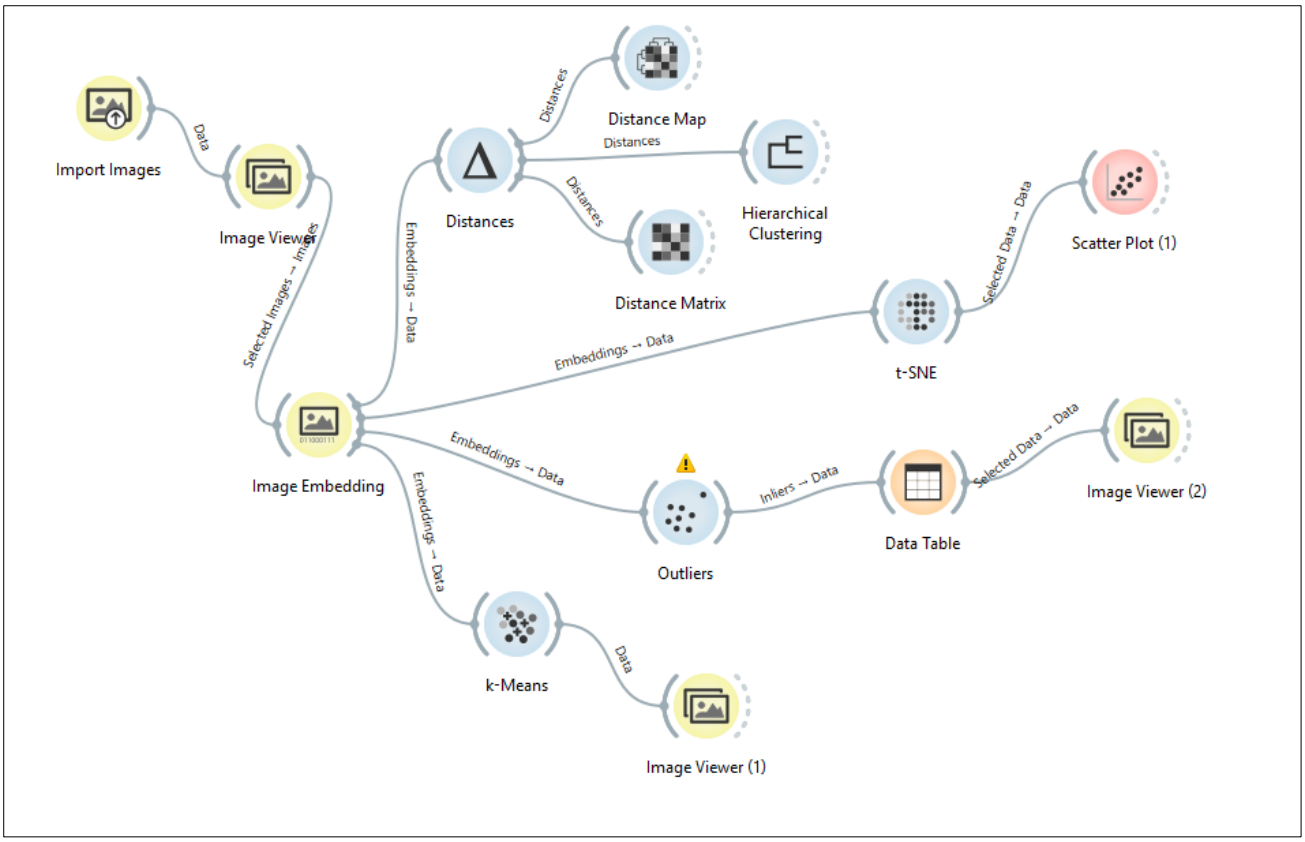

Figure 1: Orange Work Flow

Table 2: Orange widgets were utilized during the analysis

Orange Widget	Purpose
Import Images	Dataset loading
Image Embedding	Deep feature extraction
Distance	Euclidean distance computation
Distance Matrix	Pairwise similarity visualization
Hierarchical Clustering	Similarity-based grouping
K-Means	Cluster identification
t-SNE	Two-dimensional visualization
Outliers	Detection of visually distinctive advertisements
Data Table	Dataset inspection

RESULTS AND DISCUSSION

Visual Similarity Analysis using Euclidean Distance Matrix:

The Euclidean distance matrix provides a quantitative representation of pairwise visual similarity among the 60 Amul topical advertisements. Lower distance values indicate advertisements with highly similar visual characteristics, whereas larger values correspond to greater visual dissimilarity. The matrix reveals several dense regions where groups of advertisements exhibit comparatively lower distances, suggesting the presence of recurring visual structures across the dataset. Although the advertisements address diverse contemporary events, their visual proximity indicates that Amul consistently preserves fundamental design elements such as illustration style, mascot placement, typography, spatial arrangement, and overall composition. Rather than producing entirely independent creative layouts for each event, the campaign appears to follow a stable visual design language that enables immediate brand recognition. This finding supports recent computer vision research demonstrating that deep image embeddings effectively capture semantic similarities between images while preserving stylistic information (Radford *et al*., 2021; Caron *et al*., 2021). From a marketing perspective, the observed similarity patterns indicate that Amul successfully balances contextual creativity with visual brand consistency, an important determinant of long-term brand equity.

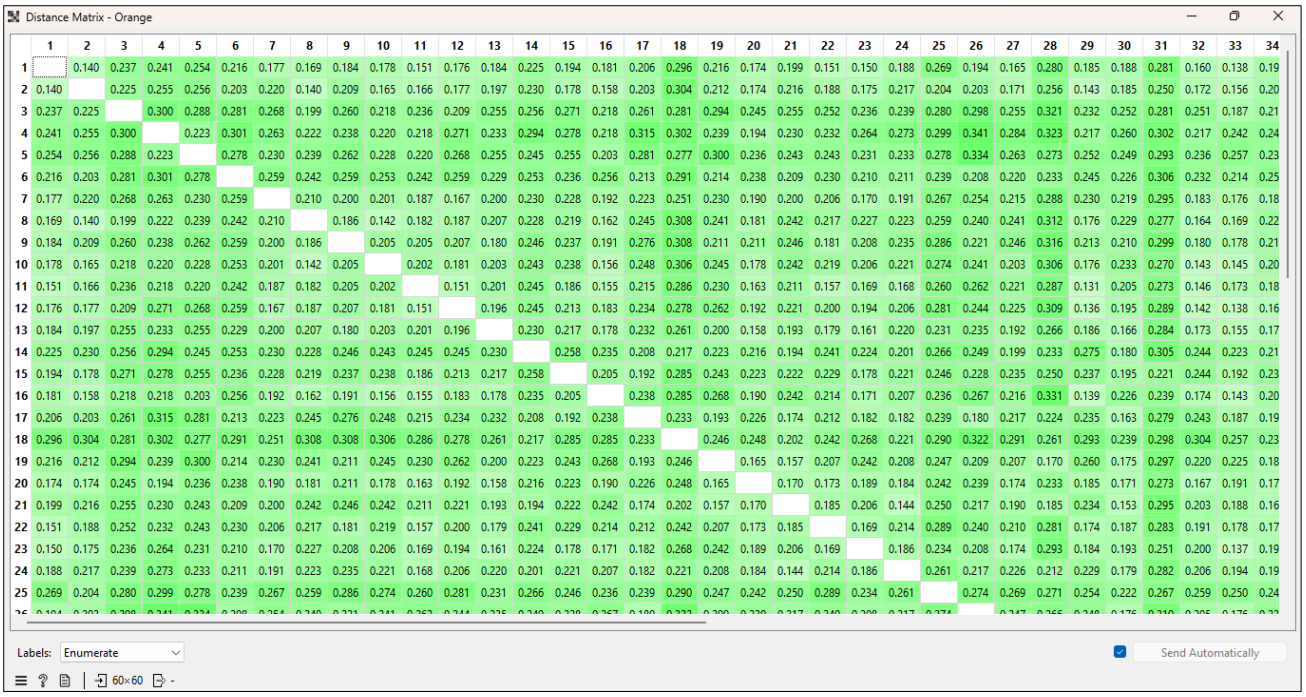

Figure 2: Euclidean Distance Matrix

Hierarchical Clustering of Advertisement Images:

Hierarchical clustering was performed to identify naturally occurring groups of visually similar advertisements. The dendrogram illustrates the hierarchical relationships among all advertisement images based on Euclidean distance computed from deep image embeddings. Several well-defined branches are observed, indicating that visually similar advertisements are progressively merged before joining larger clusters. The clustering pattern demonstrates that advertisements covering different topical events often share common artistic features despite differences in subject matter. Unlike manual categorization based on event type, hierarchical clustering organizes advertisements according to latent visual characteristics extracted automatically by deep learning. This confirms that visual similarity is primarily driven by recurring design patterns rather than topical content. These findings are consistent with recent studies employing deep visual embeddings for image organization and semantic similarity analysis, where hierarchical clustering successfully identifies hidden relationships in complex image collections.

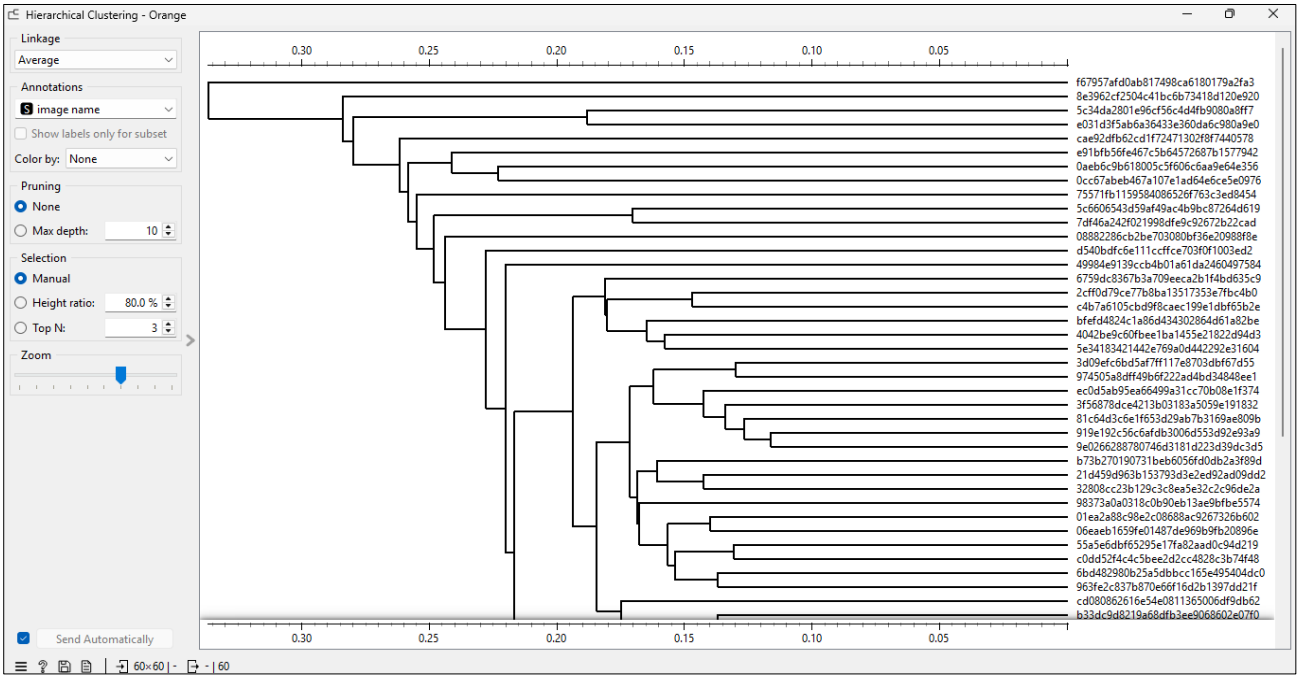

Figure 3: Hierarchical Clustering

Cluster-wise Visualization of Similar Advertisements:

The clustered image visualization provides qualitative validation of the hierarchical clustering results. Images grouped together exhibit similar illustration styles, character proportions, color distributions, text placement, and overall composition. Although the advertisements communicate different messages, each cluster demonstrates remarkable stylistic coherence. This observation indicates that Amul's creative process follows a standardized visual framework while adapting illustrations to reflect contemporary events. The presence of visually coherent clusters demonstrates that the extracted deep image embeddings effectively represent advertisement characteristics and provide meaningful feature representations for clustering. Such consistency contributes significantly to maintaining brand identity because consumers recognize the campaign through visual appearance before reading textual content.

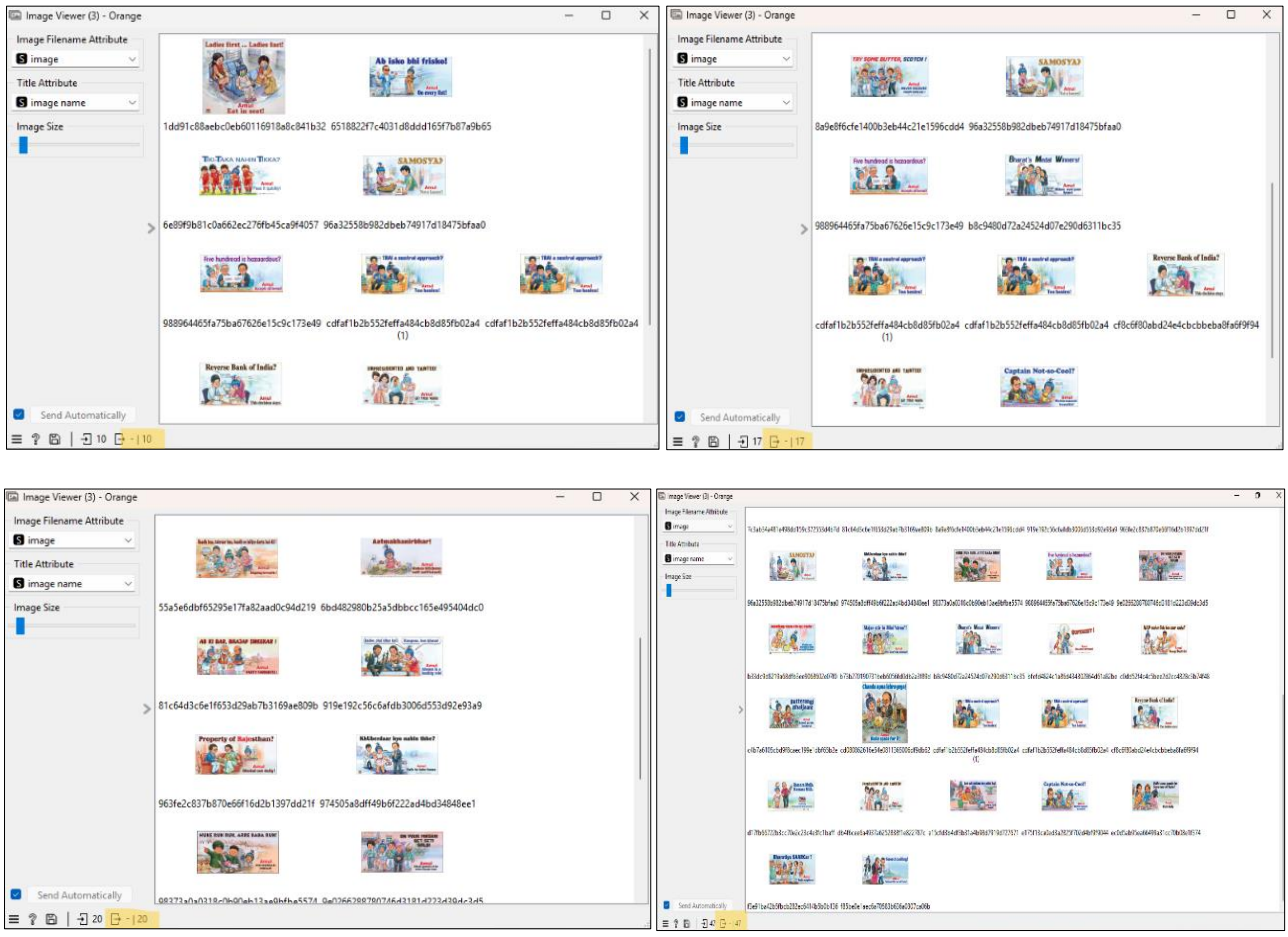

Figure 4: Cluster-wise Visualizations

K-Means Clustering Analysis:

K-Means clustering partitioned the advertisement dataset into four visually homogeneous groups based on deep image embeddings. Each cluster represents a collection of advertisements sharing similar artistic composition and visual semantics. The distribution of advertisements across the four clusters suggests that while Amul continuously introduces creative variations, these variations remain within a limited number of recurring visual templates. This finding demonstrates that Amul maintains controlled visual diversity rather than unrestricted creative variation. Such structured diversity enables advertisements to remain visually engaging without compromising brand consistency. The clustering results further validate the effectiveness of unsupervised machine learning for identifying recurring design patterns in advertising images.

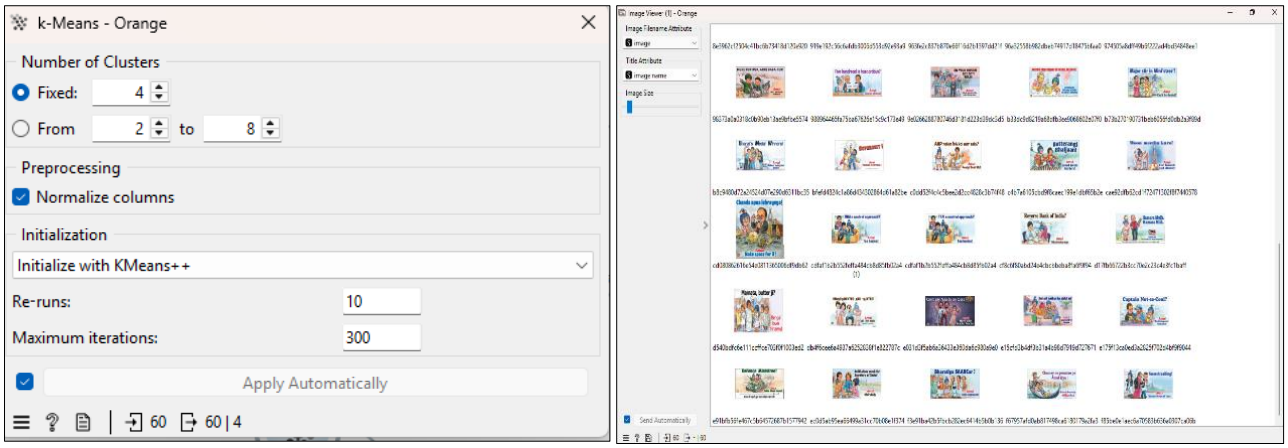

Figure 5: K-Means Clustering

Cluster Distribution Analysis:

The cluster statistics summarize the distribution of advertisements across the four clusters. The relatively balanced cluster sizes indicate that the dataset contains multiple recurring visual styles rather than being dominated by a single design pattern. This suggests that Amul strategically employs several standardized illustration approaches depending on the nature of the topical event while maintaining overall visual consistency. Such controlled variation reflects an effective branding strategy where creativity operates within recognizable visual boundaries.

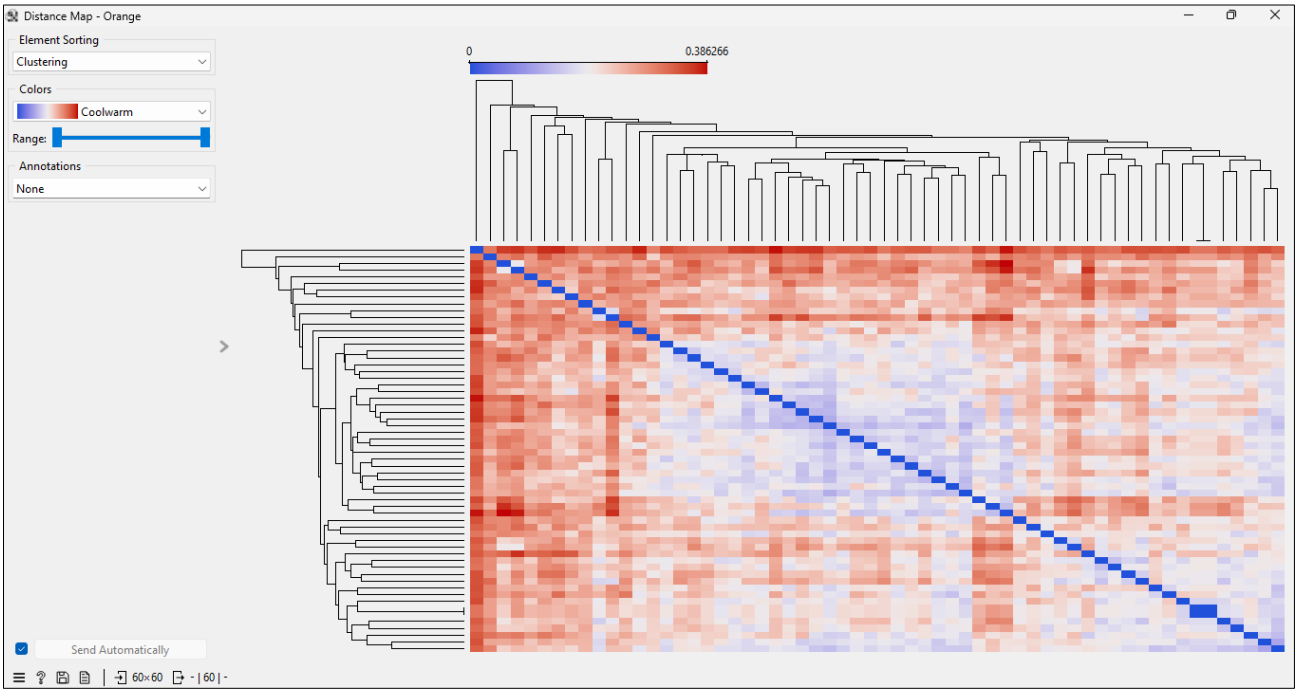

Figure 6: Cluster Distribution Analysis

Visualization using t-SNE:

The t-distributed Stochastic Neighbour Embedding (t-SNE) projection transforms the high-dimensional image embeddings into a two-dimensional representation while preserving neighbourhood relationships. Distinct clusters are clearly visible within the projection, confirming that advertisements sharing similar visual characteristics occupy nearby regions in the embedding space. The absence of excessive overlap among clusters indicates that the extracted image embeddings effectively discriminate between different visual styles while preserving similarities among related advertisements. The t-SNE visualization complements both hierarchical clustering and K-Means results, providing strong evidence that the dataset contains meaningful latent visual structures rather than randomly distributed images.

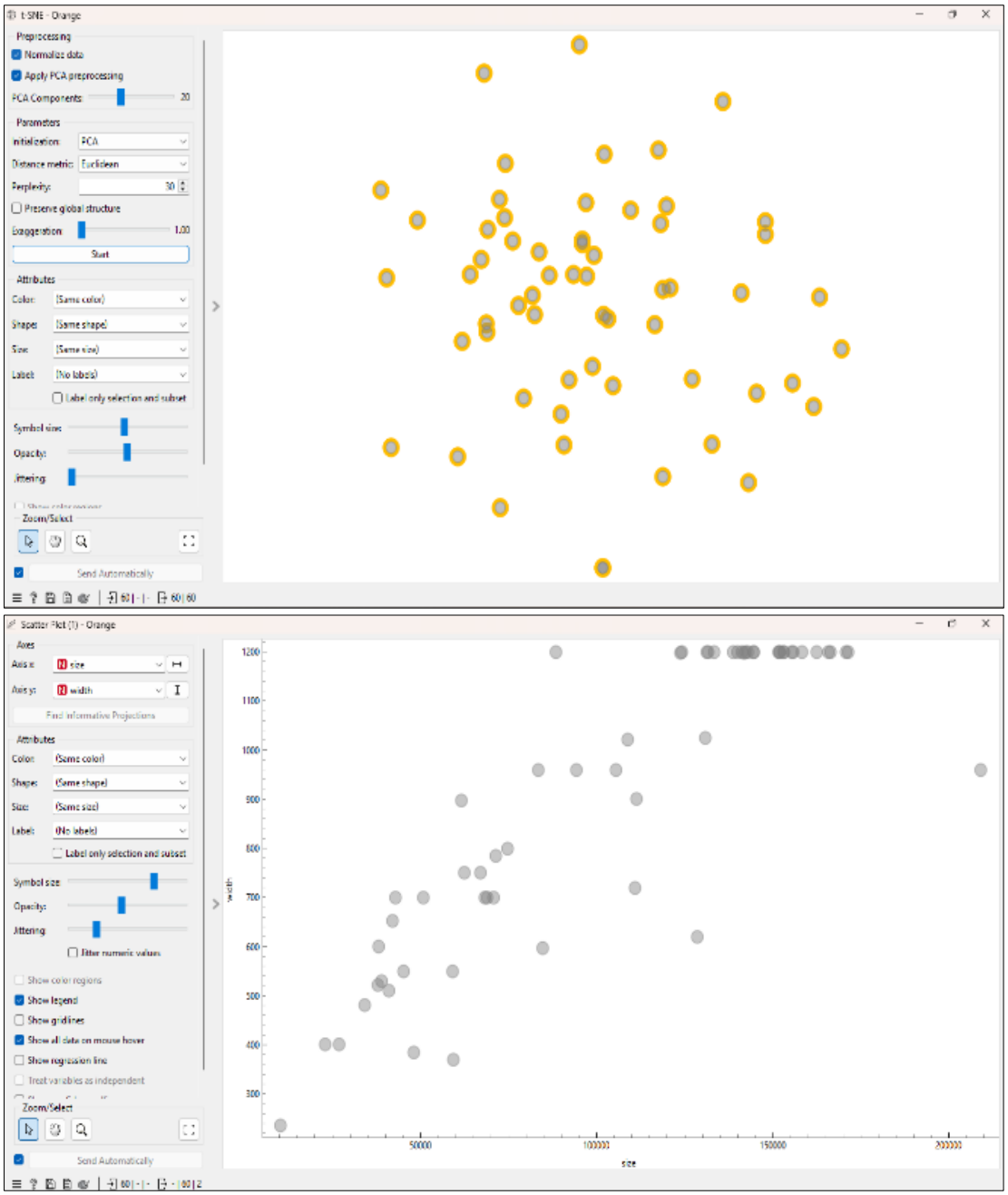

Figure 7: t-SNE

Outlier Detection:

Outlier analysis was conducted to identify advertisements exhibiting distinctive visual characteristics compared to the remaining dataset. Only a limited number (3 images) of advertisements were identified as outliers, indicating that the majority of the dataset follows a highly consistent visual design language. The relatively small number of outliers demonstrates that Amul rarely deviates from its established artistic style, even when representing highly diverse topical events. From a branding perspective, occasional visual deviations may represent deliberate creative decisions introduced to emphasize exceptional events without disrupting overall brand identity.

Visual inspection of the identified outlier advertisements reveals noticeable differences in layout composition, illustration density, mascot positioning, color balance, or graphical arrangement. Despite these deviations, the advertisements continue to preserve core branding elements including illustration style and mascot identity. This suggests that creative flexibility is implemented selectively while maintaining sufficient visual consistency to preserve brand recognition. Such findings demonstrate the robustness of Amul's visual branding strategy over time.

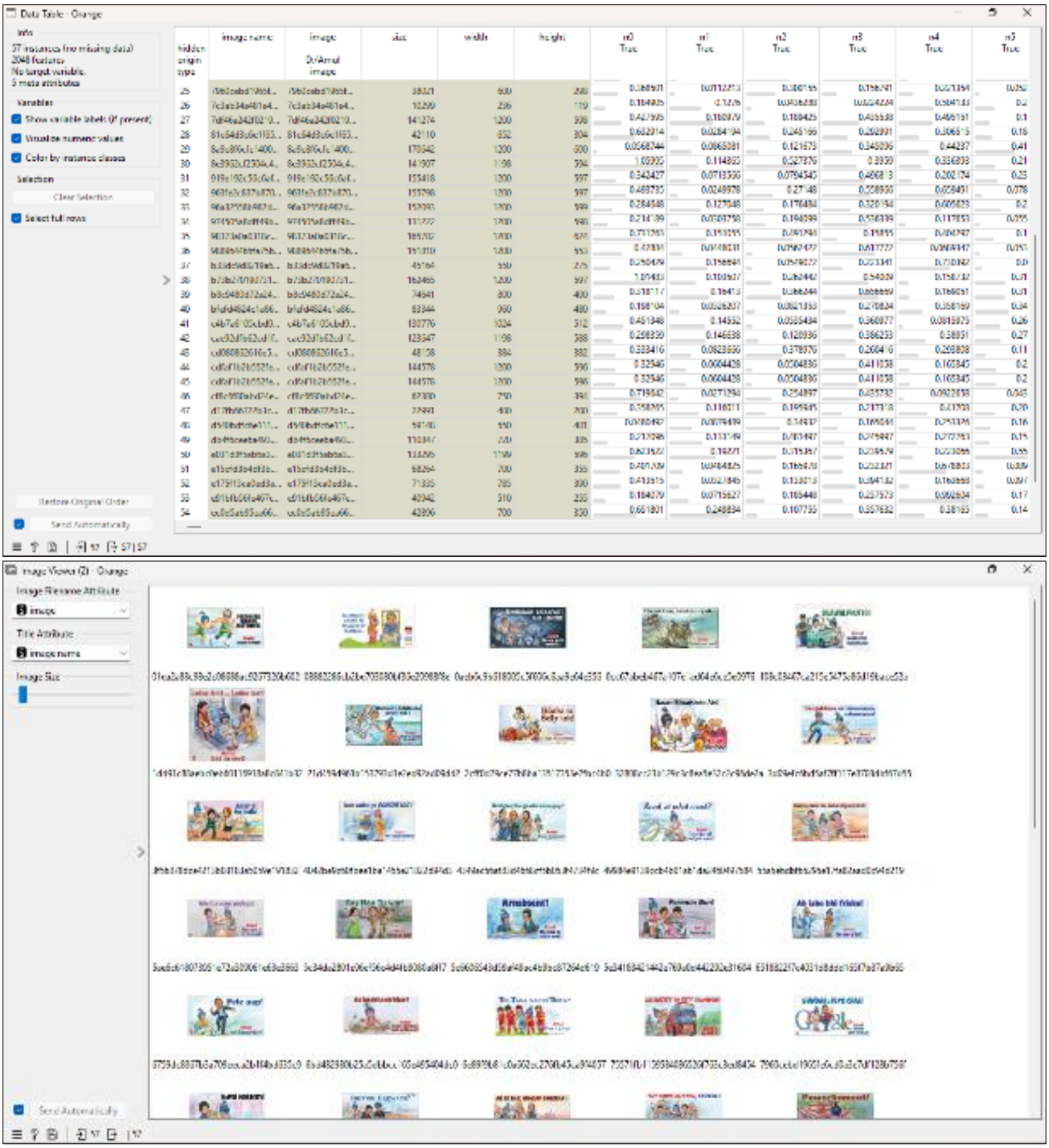

Figure 8: Outlier Detection

The combined findings obtained from Euclidean distance analysis, hierarchical clustering, cluster visualization, K-Means clustering, t-SNE projection, and outlier detection consistently demonstrate that Amul's topical advertisements exhibit a high degree of visual consistency despite representing a wide variety of contemporary events. Deep image embeddings successfully captured semantic visual characteristics, enabling unsupervised machine learning algorithms to identify stable clusters, recurring design patterns, and only a few visually distinctive advertisements.

Unlike traditional advertising research, which primarily relies on manual coding, consumer surveys, or textual content analysis, the present study provides an objective computational framework for evaluating brand visual identity using image analytics. The integration of Orange Data Mining with deep image embeddings demonstrates that artificial intelligence can effectively quantify visual branding consistency while minimizing human subjectivity. These findings align with recent advances in computer vision and marketing analytics, where deep visual representations have been increasingly

employed to analyze branding strategies, creative design, and consumer-facing visual communication.

The results confirm that Amul has successfully maintained a recognizable visual identity by preserving consistent illustration styles, typography, mascot representation, and compositional structure across decades of topical advertisements while simultaneously accommodating creative variations required for contextual storytelling. This study therefore extends existing literature by introducing a scalable, reproducible, and AI-driven methodology for assessing long-term visual consistency in advertising campaigns. The proposed framework can be readily adapted to evaluate other brands, creative campaigns, and digital marketing assets, contributing to the growing convergence of computer vision, image analytics, and marketing science.

Practical and Theoretical Implications

Theoretical Implications:

This study contributes to the growing body of literature at the intersection of computer vision, image analytics, branding, and marketing analytics by proposing a novel framework for evaluating visual consistency in advertising campaigns using deep image embeddings and unsupervised machine learning. While previous research has predominantly focused on consumer behaviour, advertising effectiveness, brand perception, and textual sentiment analysis, relatively few studies have quantitatively examined the visual dimension of long-term advertising campaigns. By integrating image analytics into branding research, the present study extends existing theoretical perspectives on visual brand identity from subjective interpretation to objective computational analysis.

A key theoretical contribution lies in demonstrating that deep image embeddings can effectively capture high-level semantic visual characteristics, including illustration style, layout composition, color distribution, mascot representation, and typography, thereby enabling quantitative assessment of brand consistency. The combination of Euclidean distance analysis, hierarchical clustering, K-Means clustering, t-SNE visualization, and outlier detection provides a comprehensive methodological framework for uncovering latent visual structures within advertising datasets. This multidimensional analytical approach advances current image analytics research by illustrating how unsupervised learning algorithms can reveal recurring visual patterns without relying on manual annotation or predefined class labels.

Furthermore, the study expands the application of Orange Data Mining beyond traditional business analytics and predictive modelling by demonstrating its capability as an accessible visual analytics platform for computer vision-based marketing research. The findings also strengthen the theoretical understanding of contextual advertising by providing empirical evidence that long-term creative adaptation can coexist with stable visual identity. The proposed framework is transferable to other domains of visual communication, including social media branding, digital advertising, product packaging, political campaigns, tourism promotion, and corporate identity analysis, thereby contributing to the broader advancement of artificial intelligence applications in marketing science.

Practical Implications:

The findings of this study provide several practical implications for marketing professionals, brand managers, advertising agencies, designers, and researchers. First, the proposed image analytics framework offers an objective and scalable approach for monitoring brand visual consistency across large collections of advertisements. Instead of relying solely on subjective expert evaluations, organizations can employ deep image embeddings and unsupervised machine learning techniques to continuously assess whether newly developed advertisements conform to established brand identity guidelines.

Second, the results demonstrate that maintaining a consistent visual language while incorporating creative adaptations enhances long-term brand recognition. The analysis of Amul's topical advertisements illustrates how recurring visual elements such as illustration style, mascot positioning, typography, and layout can preserve brand identity despite changing advertising themes. This insight can assist creative teams in developing advertising campaigns that balance innovation with consistency, thereby improving consumer recall and strengthening brand equity.

Third, the proposed framework can support creative decision-making by identifying visually similar campaigns, detecting redundant designs, and highlighting outlier advertisements that significantly deviate from established visual patterns. Such analytical capabilities enable advertising agencies to evaluate creative diversity, maintain design standards, and optimize campaign development using evidence-based insights rather than subjective judgment alone.

Finally, the methodology provides a practical and cost-effective solution for organizations seeking to integrate artificial intelligence into marketing analytics. Since Orange Data Mining offers a visual programming environment that requires minimal coding expertise, the proposed workflow can be readily adopted by academic researchers, marketing analysts, and industry practitioners. Beyond advertising, the framework can be extended to evaluate visual consistency in product packaging, social media content, corporate branding, digital marketing campaigns, tourism promotion, and other forms of visual communication. Consequently, this study demonstrates the potential of image analytics as a

valuable decision-support tool for contemporary branding and marketing strategy while encouraging wider adoption of AI-driven visual analytics in both research and professional practice.

CONCLUSION

This study presented an image analytics framework to investigate the visual consistency of selected 60 Amul topical advertisements using Orange Data Mining and unsupervised machine learning techniques. By employing deep image embeddings, Euclidean distance analysis, hierarchical clustering, K-Means clustering, t-distributed Stochastic Neighbour Embedding (t-SNE), and outlier detection, the study objectively examined the latent visual relationships among advertisements without relying on manual annotation. The results revealed that, despite depicting a wide range of socio-political, cultural, sporting, and contemporary events, Amul advertisements consistently preserve their distinctive visual identity through recurring illustration styles, typography, mascot representation, color composition, and layout design. The clustering analyses identified coherent groups of visually similar advertisements, while the limited number of detected outliers demonstrated that creative deviations occur only occasionally, without compromising the overall brand identity.

The findings highlight the effectiveness of deep image embeddings in capturing semantic visual characteristics and demonstrate the capability of unsupervised machine learning to quantify visual consistency in advertising campaigns. Unlike conventional qualitative content analysis, the proposed framework offers an objective, scalable, and reproducible methodology for evaluating visual branding using artificial intelligence. This research contributes to the emerging convergence of computer vision, image analytics, and marketing analytics by extending the application of AI-driven visual analysis to contextual advertising. Furthermore, it establishes Orange Data Mining as an accessible platform for conducting advanced image analytics without extensive programming expertise.

Concluding the study, it confirms that Amul has successfully maintained a strong and recognizable visual identity while continuously adapting its advertisements to changing contemporary events, thereby reinforcing long-term brand recognition and communication effectiveness. The proposed framework is not limited to Amul and can be applied to other advertising campaigns, corporate branding strategies, social media content, product packaging, and digital marketing assets. Future research may extend this work by incorporating larger datasets, multimodal analysis integrating textual and visual features, comparative evaluation across multiple brands, and advanced deep learning models to further enhance AI-based assessment of visual branding consistency.

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