Personalized Advertising Design Based on Individual's Appearance

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Market segmentation is a crucial marketing strategy that involves identifying and defining distinct groups of buyers to target a company's marketing efforts effectively. Visual elements, such as color and shape, in advertising can effectively communicate the product or service being promoted and influence consumer perceptions of its quality. Similarly, a person's outward appearance plays a pivotal role in nonverbal communication, significantly impacting human social interactions and providing insights into individuals' emotional states.

customer's psychology   deep learning   seven universal styles

1. Introduction

Marketing plays a crucial role in leveraging machine learning for various business applications. Effective advertising communication is an essential tool in the strategic planning of any business involved in the trade of goods or services as it directly impacts revenue and precedes other areas, like customer service and sales planning.

In the digital age, modern marketing benefits from a vast amount of quantifiable data that can be leveraged in machine learning systems. While many small and medium-sized companies may be relatively new to marketing applications utilizing machine learning, trends indicate that this technology is highly favorable and its implementation is expected to increase [1].

In the past, mass advertising was the prevailing marketing standard. However, in recent times, people expect a more personalized approach, and a mass marketing strategy may no longer be as effective. Targeted ads offer flexibility, allowing businesses to tailor their advertisements to directly engage with specific segments by understanding their needs and desires [2].

An essential objective of marketing strategies is to understand the needs and preferences of potential customers, enabling the segmentation of a target market comprising individuals who are most likely to respond positively to advertising efforts [3]. This information can also be used to adapt the presentation of advertisements, aiming to elicit a favorable response. Several studies have been presented that contribute to understanding consumer behavior, technology adoption, and brand performance in the context of online shopping, e-banking, and social media platforms [4][5][6][7][8].

Psychological factors specific to individual customers are considered important segmentation variables. These factors, including personality, lifestyle, and appearance traits, stem from individuals' preferences, interests, and needs. Marketers can leverage these traits to establish more effective communication through advertising [9]. This collection of features is often referred to as *customer psychological traits* or the *psycho-cognitive spectrum* [10]. Research has shown that psychological traits can be extracted from various sources, such as speech, body language, and physical appearance. In the context of physical appearance, the concept of "Style" arises. Style refers to identifiable patterns in an individual's physical appearance that externalize and describe their psychological, sociological, economic, vocational, and behavioral environments [11][12].

While variables like demographics can be easily obtained and provide some information, their collective nature often makes them fall short in meeting business demands. In contrast, psychological traits offer valuable insights but are more challenging to obtain and measure. Due to the complexity involved in acquiring these traits, they are typically overlooked in advertising strategies [13].

The significance of the style concept in this study is noteworthy, as it captures psychological traits through observable components of a person's appearance. Establishing a relationship between easily obtainable elements, such as photographs or videos, and the psychological traits necessary for market segmentation enables the proposal of a model that automates these processes, providing tools to achieve business goals.

Biases and Attributions for Personalized Recommendations

Personalized marketing involves using data and insights to tailor marketing messages and experiences to individual consumers. Biases and attributes can be combined to create more effective personalized marketing strategies. Here are some ways that biases and attributes can be used in personalized marketing.

Eliminating unintended bias. Personalized marketing can sometimes result in unintended discrimination due to underlying correlations in the data between protected attributes and other observed characteristics used by marketers. To avoid this, marketers can use bias-eliminating adapted trees (BEATs) to eliminate unintended bias in personalized policies [14].

Marketing attribution. Attribution models can be subject to correlation-based biases when analyzing the customer journey, causing it to look like one event caused another when it may not have. To avoid this, marketers should use effective attribution to reach the right consumer at the right time with the right message, leading to increased conversions and higher marketing ROI. Attribution data can also be used to understand the messaging and channels preferred by individual customers for more effective targeting throughout the customer journey [15] (https://www.marketingevolution.com/marketing-essentials/marketing-attribution (accessed on 18 August 2023)).

Personalized recommendations. Personalized recommendations can be based on a wide range of factors, including past purchases, browsing history, search queries, and demographics. For example, marketers can use personalized recommendations to suggest products or services that are likely to be of interest to individual customers [16][17].

Cognitive biases. Cognitive biases can be used in marketing to boost customer retention. For example, personalized marketing messages can be used to create a bond with the audience, and marketers can align with customer values by promoting charity, sustainability, and other noble causes. The reciprocity bias can also be used in loyalty programs that focus on building an emotional connection with customers [18].

It is important to note that personalized marketing can exacerbate existing inequalities and biases if personalization is based on sensitive data such as race, gender, or other protected attributes. Marketers should be aware of these considerations and guidelines to ensure that their personalized marketing strategies are ethical and inclusive [19]. By understanding biases and using them in a thoughtful and intentional way, marketers can create more impactful campaigns and improve their overall marketing success [20].

2. Style Model

2.1. Apparent Style

Style refers to identifiable patterns in an individual's physical appearance that describe and externalize their psychological, sociological, economic, vocational, and behavioral environments [11][12].

Initially, studies in human behavior and social interaction focused primarily on verbal communication. However, in the early 1960s, a new field of analysis called nonverbal communication emerged. This interdisciplinary research, involving anthropologists, sociologists, psychologists, philosophers, semiotics specialists, and linguists, explores the body, style, and language. Some studies [21] have expanded the realm of semiology to encompass all phenomena that carry meaning and recognize the communicative value of clothing. These authors acknowledge the existence of a language of communication through style [22].

The style of clothing evolves from the interplay between an individual and their sociocultural environment [23]. This interaction gives rise to various accessories, and as social groups, individuals construct meanings associated with these garments. Anthropologically, clothing serves as a vessel of accumulated information [24].

The community interprets this code through a voluntary or unconscious process of recognition, allowing clothing to convey desired social meanings [25].

While style is understood to reflect intrinsic traits of each individual, the material aspect it encompasses should not be overlooked. The individual is constrained in various ways when expressing their style within the limitations imposed by their environment, be it adhering to dress conventions, such as uniforms or work attire, or simply having access to certain types of clothing.

Therefore, most models designed to evaluate style focus on specific instances, capturing a snapshot that reflects an individual's features and considering only the elements of style present at that particular time. This evaluation assumes some level of stability and freedom of choice regarding the multiple garments an individual can wear at

different times [26]. Furthermore, although it presents a limitation, the inherent intentionality of style allows for its evaluation in this manner. This particular aspect is commonly referred to as the *style image* or *apparent style* [23].

2.2. Seven Universal Styles Model

In her work [27], Alice Parsons presents a style evaluation model based on seven distinct types. This framework categorizes individuals' clothing based on the messages they convey to others.

These concepts have undergone scrutiny by traditional social science disciplines [28] and represent one of the most widely accepted models for evaluating apparent style. The theoretical foundation has been instrumental in various communication professions, ensuring consistent information transmission and proving valuable when assessing the style of individuals or companies and their interactions [29].

Parsons outlines the seven universal styles in her research [27], providing descriptions that encompass the defining traits of each style, a set of keywords associated with the individual, chromatic and geometric guidelines for patterns and designs, and a collection of psychological traits typically associated with each style.

Figure 1 presents an overview of the seven universal styles model, providing a concise description of each style, including keywords, associated geometric structures, significant psychological characteristics, and a color palette archetype.

Figure 1. Seven universal styles model.

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