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THE DARK SIDE OF DIGITAL BRANDING: EXPLORING FAKE ONLINE REVIEWS, INFLUENCER CREDIBILITY, AND CONSUMER TRUST IN SOCIAL MEDIA-DRIVEN MARKETING ENVIRONMENTS

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Abstract

In an increasingly interconnected digital marketplace, consumer trust has emerged as both a strategic asset and a growing vulnerability as deceptive online reviews, manipulated influencer endorsements, and misleading promotional practices threaten the credibility of social media-driven branding. This study critically examines the darker dimensions of digital branding by investigating the interconnected effects of fake online reviews, influencer credibility, brand authenticity, and consumer skepticism on consumer trust and purchasing intentions. Employing a quantitative research design, the study examines a dataset comprising 650 social media consumers engaged with Instagram, Facebook, TikTok, and YouTube. An integrated analytical framework combining Structural Equation Modeling (SEM), Random Forest, Extreme Gradient Boosting (XGBoost), and SHapley Additive exPlanations (SHAP) is employed to investigate behavioral relationships, evaluate predictive performance, and identify influential determinants of consumer trust. The reported SEM results reveal a substantial negative relationship between perceived fake online reviews and consumer trust ($\beta = -0.624$, $p < 0.001$), while influencer credibility ($\beta = 0.587$, $p < 0.001$) and perceived brand authenticity ($\beta = 0.531$, $p < 0.001$) demonstrate significant positive associations. Consumer skepticism partially mediates the relationship between deceptive promotional exposure and purchasing intentions (indirect $\beta = -0.218$, $p = 0.003$), while consumer trust strongly predicts purchasing intentions ($\beta = 0.673$, $p < 0.001$). Comparative predictive analysis reports accuracies of 88.6% and 92.4% for Random Forest and XGBoost, respectively, demonstrating the superior performance of XGBoost. SHAP-based interpretability further identifies review authenticity, influencer transparency, brand reputation, and advertising disclosure as influential determinants of consumer trust. Collectively, these findings highlight how deceptive digital branding practices can erode consumer confidence and compromise long-term brand credibility, whereas transparent influencer communication and authentic consumer engagement can strengthen sustainable brand relationships. By integrating consumer behavior theory with explainable machine learning, the study contributes an interdisciplinary perspective to digital marketing research and offers actionable implications for brand managers, regulatory authorities, and social media platforms seeking to foster ethical, transparent, and trustworthy digital marketing ecosystems.

Keywords: Digital Branding, Fake Online Reviews, Influencer Credibility, Consumer Trust, Brand Authenticity, Consumer Skepticism, Social Media Marketing, SEM, XGBoost, SHAP

1. Introduction

The rapid evolution of digital technologies and social media platforms has fundamentally transformed the nature of branding, marketing communication, and consumer decision-making. Digital branding has emerged as a strategic mechanism through which organizations establish brand identities, communicate value propositions, strengthen customer engagement, and influence purchasing behavior in increasingly competitive

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online marketplaces. Social media platforms, including Instagram, Facebook, TikTok, and YouTube, have become influential marketing environments where consumers interact with brands, exchange product experiences, evaluate recommendations, and develop perceptions of brand credibility. Unlike traditional marketing channels, social media facilitates multidirectional communication through electronic word-of-mouth (eWOM), user-generated content, online reviews, and influencer endorsements (Filieri, 2015). These interactive features provide organizations with substantial opportunities to enhance brand visibility and develop consumer relationships. However, the increasing dependence on digitally mediated information has also introduced significant challenges concerning information authenticity, promotional transparency, and consumer trust. Consequently, the effectiveness of contemporary digital branding depends not only on the reach and attractiveness of promotional content but also on consumers' confidence in the credibility and integrity of the information they encounter.

Despite the considerable benefits of digital branding, deceptive marketing practices have become an increasingly important concern within social media-driven commercial environments. Fake online reviews, fabricated customer testimonials, undisclosed sponsored endorsements, artificially inflated engagement metrics, and misleading promotional claims can distort consumer perceptions and undermine the reliability of digital information (Petrescu et al., 2022). Among these practices, fake online reviews represent a particularly problematic form of information manipulation because consumers frequently rely on the experiences and evaluations of other users when making purchasing decisions. Luca and Zervas (2016) demonstrated the relevance of review manipulation to online reputation management, highlighting the strategic incentives associated with fraudulent reviews. More recently, Sahut et al. (2024) emphasized that deceptive online reviews can compromise information quality, weaken consumer confidence, and threaten the credibility of digital marketplaces. Such practices create substantial information asymmetries between consumers and marketers, making it increasingly difficult for individuals to distinguish genuine consumer experiences from commercially motivated deception. As a result, perceived review manipulation may produce uncertainty, increase skepticism, and negatively influence consumers' evaluations of brands and their purchasing intentions (Federal Trade Commission, 2024).

Another critical dimension of contemporary digital branding concerns the expanding influence of social media personalities on consumer attitudes and behavioral intentions. Influencer marketing has developed into a prominent promotional strategy because social media influencers can establish relatively personal relationships with their audiences through recurring interactions, lifestyle-oriented content, and product recommendations. Consumers may perceive influencers as accessible and relatable sources of information, particularly when their content reflects genuine experiences and consistent personal values. From the perspective of Source Credibility Theory, the effectiveness of influencer communication depends on characteristics such as perceived expertise, trustworthiness, and attractiveness. Recent meta-analytical evidence confirms the importance of influencer credibility and related psychological mechanisms in shaping consumer engagement and behavioral responses (Han et al., 2023). Nevertheless, the commercialization of influencer communication raises important ethical concerns. Undisclosed sponsorships, exaggerated product claims, and promotional relationships that conflict with an influencer's established identity may weaken perceived credibility and undermine audience trust. Although sponsorship disclosure can improve transparency, its influence on consumer responses is complex because explicit commercial disclosures may simultaneously activate persuasion knowledge and alter perceptions of endorsement credibility. Therefore, understanding the role of influencer credibility is essential for distinguishing persuasive but ethical branding practices from potentially deceptive promotional activities.

Alongside influencer credibility, perceived brand authenticity has become an important determinant of consumer trust in digital environments. Brand authenticity refers to consumers' perceptions that a brand consistently demonstrates sincerity, credibility, integrity, and alignment between its stated values and actual behavior (Morhart et al., 2015). Within social media marketing, authenticity may be communicated through transparent promotional practices, accurate product representations, genuine customer interactions, and consistency between brand promises and consumer experiences. Brands perceived as authentic may be better positioned to establish meaningful relationships with consumers and reduce uncertainty associated with online

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transactions. Conversely, inconsistencies between brand communication and actual practices may generate doubts about organizational integrity. The growing presence of manipulated reviews and commercially motivated endorsements further complicates the evaluation of authenticity because consumers must assess whether favorable brand-related information reflects legitimate customer satisfaction or artificially constructed promotional narratives. Accordingly, brand authenticity represents a potentially important mechanism for sustaining consumer confidence in marketing environments characterized by substantial information uncertainty.

Although existing research has provided valuable insights into online review manipulation, influencer marketing effectiveness, and digital consumer behavior, several opportunities for further investigation remain. First, research on fake online reviews and influencer credibility has frequently developed through relatively distinct streams of inquiry, providing scope for a more integrated examination of their relationships with brand authenticity, skepticism, and trust. Second, greater attention is needed to the psychological mechanisms through which exposure to deceptive promotional practices influences purchasing intentions, particularly the mediating role of consumer skepticism. Third, conventional statistical approaches, while valuable for examining theoretically specified relationships, may provide a limited account of complex nonlinear associations and interactions among consumer perceptions. Consequently, integrating explanatory statistical modeling with advanced predictive techniques offers a promising opportunity to develop a more comprehensive understanding of consumer trust in social media-driven marketing environments. These limitations motivate the development of a framework that simultaneously examines theoretical relationships, predictive performance, and the interpretability of influential consumer trust determinants (Sahut et al., 2024).

To address these research opportunities, the present study investigates the interconnected relationships among perceived fake online reviews, influencer credibility, brand authenticity, consumer skepticism, consumer trust, and purchasing intentions within social media-driven marketing environments. Drawing upon quantitative data from 650 social media consumers engaging with Instagram, Facebook, TikTok, and YouTube, the study employs an integrated analytical framework combining Structural Equation Modeling (SEM), Random Forest, Extreme Gradient Boosting (XGBoost), and SHapley Additive exPlanations (SHAP). SEM is employed to evaluate the theoretically proposed relationships and the mediating role of consumer skepticism, while Random Forest and XGBoost are used to assess predictive performance and capture potentially complex relationships among consumer-related variables. XGBoost, introduced by Chen and Guestrin (2016), provides an efficient gradient-boosting framework for predictive modeling. Furthermore, SHAP, developed by Lundberg and Lee (2017), facilitates the interpretation of machine learning predictions by attributing contributions to individual predictors (Lundberg & Lee, 2017). The integration of these techniques enables the investigation of both theoretically meaningful relationships and the relative predictive importance of factors associated with consumer trust.

The present study seeks to make three principal contributions to digital marketing and consumer behavior research. First, it advances an integrated conceptual perspective by examining deceptive online reviews, influencer credibility, and perceived brand authenticity within a unified framework of consumer trust and purchasing intentions. Second, it extends understanding of consumer responses to deceptive promotional practices by investigating consumer skepticism as a mediating mechanism, thereby connecting persuasion-related psychological processes with purchasing behavior (Friestad & Wright, 1994). Third, it contributes methodologically by combining SEM with ensemble machine learning and explainable artificial intelligence, allowing theory-driven statistical analysis to be complemented by predictive assessment and feature-level interpretation. From a managerial perspective, the study offers insights into the importance of authentic customer feedback, responsible influencer partnerships, advertising disclosure, and transparent brand communication. Its findings may also inform regulatory authorities and social media platforms seeking to strengthen consumer protection and discourage deceptive promotional practices. Overall, this study responds to the growing need to examine the ethical vulnerabilities of digital branding and their implications for consumer confidence. By investigating how potentially deceptive information and credibility-related perceptions shape trust and purchasing intentions, the research aims to advance understanding of the darker

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dimensions of social media marketing while identifying factors that can support more trustworthy and sustainable digital brand relationships.

2. Deceptive Digital Branding and Fake Online Reviews

The rapid expansion of digital technologies and social media platforms has fundamentally transformed branding practices, marketing communication, and consumer decision-making processes. Contemporary digital branding extends beyond conventional promotional activities by incorporating electronic word-of-mouth (eWOM), online consumer reviews, influencer-generated content, and interactive communication across social media platforms. These developments have enabled organizations to communicate directly with consumers, establish brand communities, and enhance market visibility through personalized digital experiences. Nevertheless, the increasing dependence on digital information has simultaneously created opportunities for misleading promotional communication and information manipulation. Deceptive digital branding has consequently emerged as a significant concern within contemporary marketing research, particularly as consumers increasingly rely on online reviews and recommendations to evaluate product quality, brand reliability, and purchasing alternatives. Although digital technologies facilitate transparency and information accessibility, their misuse may weaken the credibility of marketing communication and negatively influence consumers' confidence in digital marketplaces.

Deceptive digital branding refers to promotional practices that deliberately misrepresent, fabricate, or conceal material information to influence consumer perceptions and purchasing behavior. Such practices include fake online reviews, manipulated product ratings, misleading customer testimonials, undisclosed commercial endorsements, and artificially generated engagement indicators (Petrescu et al., 2022). These activities exploit the informational limitations consumers face when evaluating products and services through digital channels. Unlike traditional advertising, where commercial intentions are generally recognizable, deceptive online content may imitate independent consumer opinions and create an artificial perception of authenticity. Consequently, consumers may interpret strategically manufactured promotional messages as genuine expressions of customer satisfaction. Mayzlin et al. (2014) demonstrated that online review manipulation can reflect strategic competitive incentives, emphasizing that businesses may attempt to influence consumer perceptions through fabricated evaluations. Similarly, Luca and Zervas (2016) examined fraudulent reviewing practices and identified relationships between organizational reputation, competitive conditions, and incentives to manipulate online reviews. These contributions demonstrate that deceptive reviewing practices are embedded within broader commercial and reputational dynamics rather than representing isolated instances of unethical online behavior.

Fake online reviews constitute one of the most problematic manifestations of deceptive digital branding because they interfere with the informational role of consumer-generated evaluations (Filieri, 2016). Online reviews ordinarily provide prospective buyers with indirect access to previous consumers' experiences, allowing them to assess product performance, service quality, and potential purchasing risks. However, fraudulent reviews distort these evaluations by introducing information that may not reflect genuine consumption experiences. Fake reviews may include fabricated positive recommendations intended to enhance a brand's reputation, strategically negative reviews targeting competing businesses, and coordinated reviewing activities designed to influence aggregate ratings. Mukherjee et al. (2012) investigated coordinated fake reviewer groups and demonstrated the relevance of collective reviewing patterns to opinion manipulation. Such practices can artificially increase or decrease perceived product attractiveness, thereby influencing the informational signals available to prospective buyers. More importantly, the presence of deceptive reviews challenges the assumption that customer-generated content necessarily reflects independent and trustworthy consumer experiences (Federal Trade Commission, 2024).

Existing research provides valuable evidence concerning the motivations, mechanisms, and consequences associated with online review manipulation. Nevertheless, these contributions emerge from different disciplinary perspectives, including marketing, consumer psychology, information systems, and computational fraud detection. A systematic synthesis of these perspectives is necessary to clarify their relevance to the present study and identify opportunities for theoretical integration. Table 1 summarizes

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selected foundational and empirical contributions, emphasizing their research focus, principal findings, and implications for understanding deceptive digital branding and consumer trust.

Table 1

Synthesis of Previous Literature on Deceptive Digital Branding and Fake Online Reviews

Author(s) and Year	Research Focus	Major Findings	Relevance to the Present Study
Mayzlin et al. (2014)	Promotional review manipulation	Firms may possess strategic incentives to manipulate online reviews.	Explains organizational motivations for deceptive digital branding.
Filieri (2015)	Online review diagnosticity	Informational and normative cues influence the usefulness and adoption of online reviews.	Supports the importance of information quality in purchasing decisions.
Luca and Zervas (2016)	Reputation and review fraud	Competitive and reputational conditions are associated with incentives for review manipulation.	Links fraudulent reviews to online reputation management.
Filieri (2016)	Online review trustworthiness	Consumers assess the credibility of online reviews through informational characteristics.	Supports review authenticity as a determinant of consumer confidence.
Petrescu et al. (2022)	Suspicion of online review deception	Examines how perceptions of deceptive reviews relate to consumer evaluations and behavioral responses.	Connects perceived deception with consumer trust and purchasing behavior.
Federal Trade Commission (2024)	Regulatory responses to fake reviews	Establishes requirements addressing specified deceptive review and testimonial practices in the United States.	Highlights the need for transparency and responsible digital marketing governance.

An important consequence of deceptive online reviews is their potential to activate consumer skepticism. According to Friestad and Wright (1994), consumers use persuasion knowledge to recognize marketing tactics and evaluate the underlying intentions of persuasive messages. When online reviews appear exaggerated, inconsistent, or commercially motivated, consumers may become increasingly suspicious of the information presented. Such suspicion can encourage more critical evaluation of promotional content and reduce consumers' willingness to rely on unverified recommendations. Nevertheless, skepticism may produce different consequences depending on individual experiences, brand familiarity, and the perceived seriousness of deception. In certain circumstances, skepticism may protect consumers from misleading information, while in others, generalized suspicion may reduce confidence even in legitimate reviews. This suggests that perceived fake reviews can influence consumer behavior through complex psychological processes rather than through a single direct mechanism (Petrescu et al., 2022).

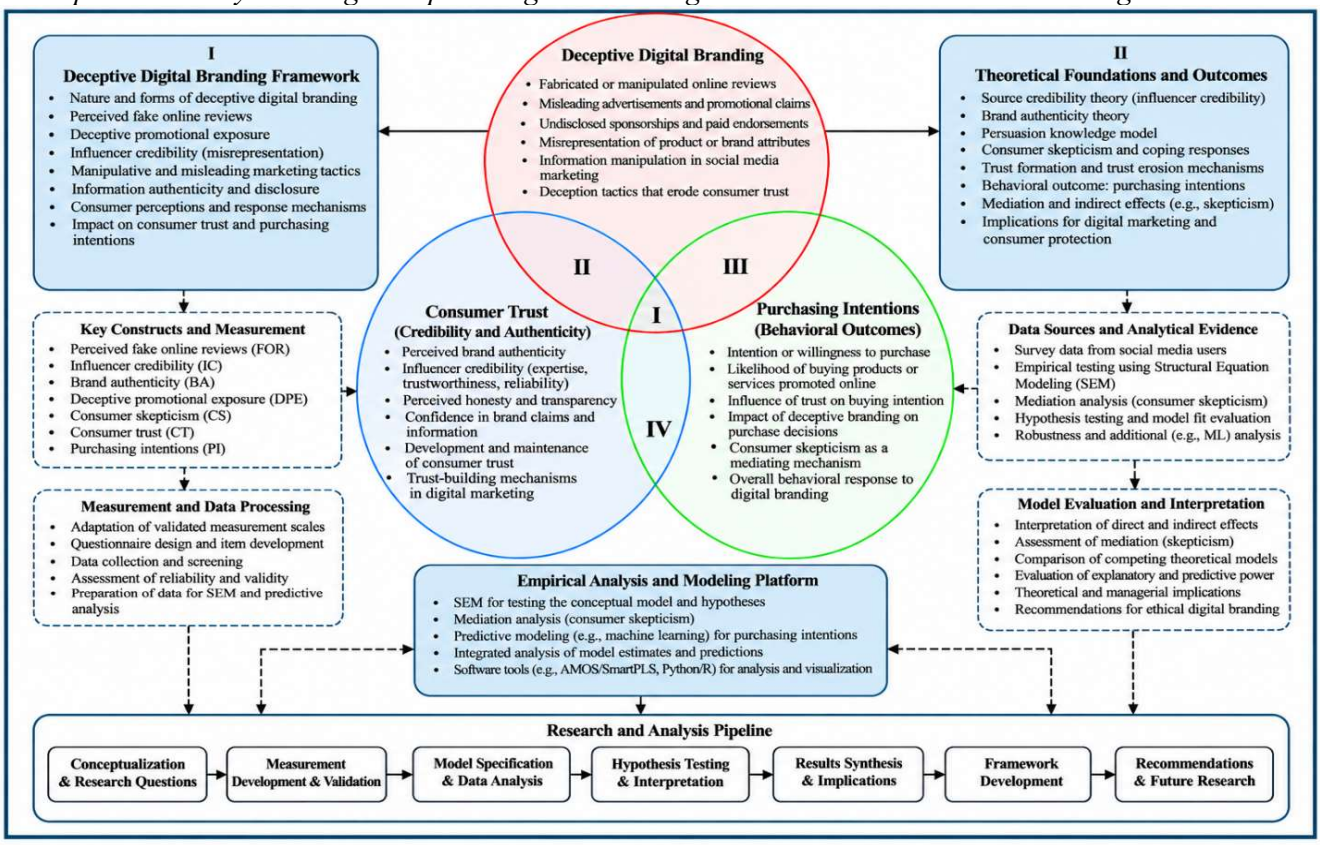
The relationship between review deception and consumer trust is particularly important because trust provides a foundation for digital purchasing decisions. In online marketplaces, consumers frequently make decisions without physically inspecting products or directly interacting with sellers. They therefore depend on reviews, ratings, testimonials, and brand communications to evaluate purchasing uncertainty. When these information sources are perceived as misleading, consumers may question the sincerity, integrity, and reliability of the associated brand. This can weaken confidence in promotional claims and reduce willingness to engage in future transactions. Conversely, brands that demonstrate transparency, encourage genuine customer feedback, and address misleading content may reinforce perceptions of integrity. From this perspective, authentic review communication can support sustainable brand relationships, while suspected manipulation may undermine consumer confidence.

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The theoretical relationships emerging from this literature can be organized into an integrated conceptual explanation of how deceptive digital branding influences consumer responses (Sahut et al., 2024). Perceived review manipulation may weaken information authenticity, increase skepticism, and undermine trust in the associated brand. These psychological consequences may subsequently influence purchasing intentions, especially when consumers interpret misleading reviews as evidence of organizational dishonesty. However, these relationships should be understood as theoretically proposed pathways rather than automatically established causal effects. Figure 1 illustrates the conceptual mechanisms linking deceptive digital branding, perceived review authenticity, consumer skepticism, consumer trust, and purchasing intentions.

Figure 1

Conceptual Pathways Linking Deceptive Digital Branding to Consumer Trust and Purchasing Intentions



Note. The figure presents the conceptual pathways and analytical pipeline linking deceptive digital branding to consumer trust and purchasing intentions.

Despite the substantial development of online review research, several important gaps remain. First, existing studies frequently examine fraudulent review detection, promotional manipulation, and information credibility as relatively distinct research domains. This separation limits understanding of how perceived deception interacts with broader branding characteristics such as influencer credibility and perceived brand authenticity. Second, a considerable proportion of foundational review-manipulation research has concentrated on dedicated review platforms, hospitality services, or e-commerce settings, suggesting the need for further investigation within contemporary social media-driven marketing environments. Third, although the consequences of perceived review deception have received increasing attention, opportunities remain to examine how consumer skepticism and trust operate within an integrated behavioral framework (Petrescu et al., 2022). Finally, combining theory-driven structural modeling with predictive and explainable machine learning may provide additional insights into the relative importance of credibility-related perceptions in shaping consumer trust. In response to these gaps, the present study positions perceived fake online reviews

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as a central dimension of deceptive digital branding and investigates their relationship with consumer trust among users of Instagram, Facebook, TikTok, and YouTube. Drawing upon Signaling Theory and the Persuasion Knowledge Model, the study assumes that perceived review manipulation weakens the credibility of online information and raises doubts about organizational integrity.

3. Brand Authenticity and Consumer Trust

Brand authenticity has emerged as a fundamental concept in contemporary marketing research, particularly as consumers increasingly evaluate brands according to their perceived honesty, integrity, transparency, and consistency rather than relying exclusively on conventional product attributes. The growing commercialization of digital communication, proliferation of sponsored content, and increasing prevalence of deceptive promotional practices have intensified the importance of authenticity in shaping consumer-brand relationships. Within social media-driven marketing environments, brand authenticity represents consumers' perceptions that an organization's communications, values, promises, and actions genuinely reflect its identity and commitments. As consumers interact with brands through Instagram, Facebook, TikTok, and YouTube, they encounter numerous promotional messages, influencer endorsements, customer testimonials, and user-generated evaluations that collectively influence judgments about brand credibility. However, the widespread circulation of manipulated reviews and misleading promotional information makes it increasingly difficult to distinguish genuine brand communication from commercially manufactured representations (Morhart et al., 2015). Under these conditions, perceived brand authenticity becomes an important foundation of consumer trust because it provides reassurance concerning the reliability and integrity of brand-related information.

The conceptualization of brand authenticity has evolved from traditional associations with originality, heritage, and craftsmanship toward a multidimensional understanding encompassing credibility, integrity, continuity, and symbolism. Napoli et al. (2014) developed a consumer-based measure of brand authenticity, emphasizing the importance of examining authenticity from the perspective of consumers rather than treating it exclusively as an objectively determined organizational characteristic. Their research established a measurement approach incorporating quality commitment, sincerity, and heritage as important dimensions of consumer-based authenticity. Similarly, Morhart et al. (2015) proposed an integrative framework identifying continuity, credibility, integrity, and symbolism as central dimensions of perceived brand authenticity. Continuity concerns perceptions that a brand remains consistent over time, credibility reflects its willingness and ability to fulfill promises, integrity involves adherence to moral principles, and symbolism captures the extent to which a brand supports consumers' identities and personal values. These conceptual developments demonstrate that authenticity is not limited to a brand's historical origins but also encompasses its perceived ethical conduct and consistency in interactions with consumers.

The multidimensional nature of brand authenticity is particularly relevant in digital environments where consumers continuously evaluate organizational behavior through publicly accessible communication. Brand credibility may be reflected in accurate product descriptions, realistic promotional claims, and consistency between advertised features and actual customer experiences. Integrity may be communicated through transparent advertising disclosures, responsible responses to consumer complaints, and a willingness to acknowledge organizational mistakes. Continuity can be reinforced when brands maintain coherent values and communication across different social media platforms, while symbolism may emerge when brand identity resonates with consumers' personal beliefs and aspirations. Nevertheless, these dimensions should not be interpreted as interchangeable (Morhart et al., 2015). A brand may maintain a consistent visual identity and recognizable historical narrative while simultaneously engaging in questionable promotional practices. Consequently, perceptions of authenticity require consumers to evaluate both symbolic branding characteristics and evidence of trustworthy organizational behavior.

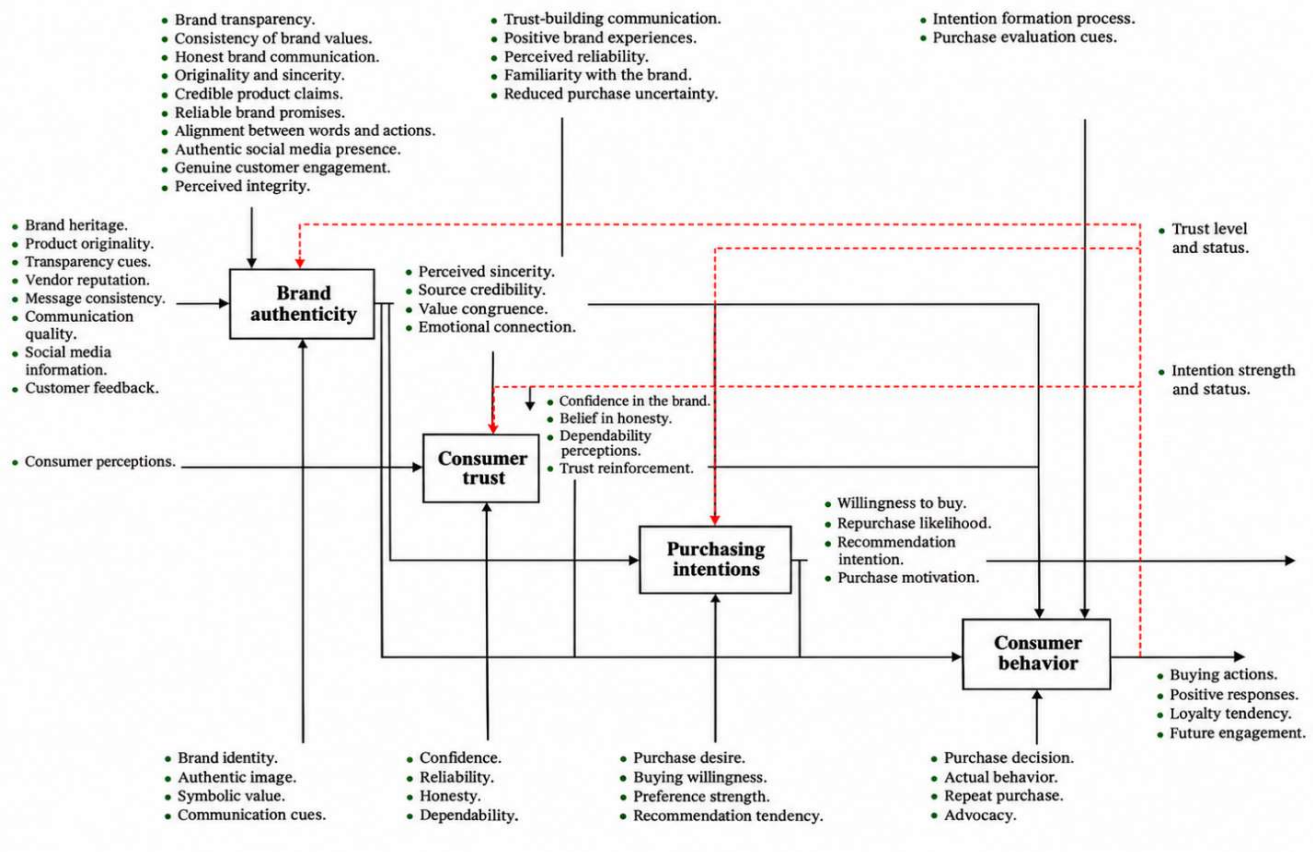
The conceptual mechanisms linking perceived brand authenticity with consumer trust can be organized around the credibility, integrity, consistency, and transparency of brand communication. Together, these characteristics can provide information that consumers use when evaluating organizational intentions and dependability (Napoli et al., 2014). Such evaluations may be particularly consequential in digital environments characterized by information asymmetry and uncertainty. Drawing upon the multidimensional authenticity framework developed by Morhart et al. (2015), together with the empirical authenticity–trust

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relationships identified in prior studies, Figure 2 presents a conceptual synthesis of the pathways through which perceived brand authenticity may contribute to consumer trust. The figure also illustrates purchasing intentions as a downstream behavioral outcome associated with consumer trust, consistent with the broader conceptual framework of the present study.

Figure 2

Brand Authenticity and Consumer Purchase Behavior



Note. The figure illustrates the conceptual synthesis of pathways through which perceived brand authenticity may contribute to consumer trust and purchasing intentions.

The theoretical relationships suggest that perceived brand credibility, integrity, continuity, and symbolism contribute to consumers' overall evaluations of brand authenticity. Stronger authenticity perceptions may subsequently enhance consumer trust by reinforcing expectations that an organization communicates honestly, behaves consistently, and fulfills its commitments. Consumer trust, in turn, may encourage purchasing intentions by reducing uncertainty and strengthening confidence in the brand's ability to deliver its promised value. Nevertheless, the figure should be interpreted as a conceptual representation rather than a fully tested measurement or structural model. In particular, the current study examines the relationship between perceived brand authenticity and consumer trust as a direct structural relationship, while the dimensional composition of authenticity must correspond to the indicators used in the actual survey instrument. Similarly, the pathway connecting consumer trust with purchasing intentions belongs to the broader research framework and is examined separately in the relevant literature review subsection (Napoli et al., 2014).

Despite considerable theoretical and empirical support for authenticity-related consumer outcomes, several opportunities for additional research remain. First, the operationalization of brand authenticity continues to differ across studies, potentially limiting comparability between research contexts. Second, authenticity research has frequently emphasized traditional brands, heritage-oriented products, and established consumer–brand relationships, whereas social media environments introduce distinctive

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challenges involving sponsored communication, manipulated customer feedback, and rapidly changing promotional narratives (Morhart et al., 2015). Third, authenticity and trust are sometimes discussed as closely related concepts without sufficient attention to their conceptual and measurement distinctions. Fourth, consumers' authenticity judgments may interact with other credibility-related factors, such as influencer reliability and perceived review manipulation, making it important to investigate these constructs within a unified research framework. These considerations create opportunities for examining the independent contribution of perceived brand authenticity to consumer trust while accounting for the broader information environment.

4. Methodology

This study adopts a quantitative research approach to investigate the relationships among deceptive digital branding practices, perceived fake online reviews, influencer credibility, brand authenticity, consumer skepticism, consumer trust, and purchasing intentions within social media-driven marketing environments. A theory-driven and predictive analytical framework is employed to develop a comprehensive understanding of the psychological and behavioral factors influencing consumer trust in digital marketplaces. The research integrates Structural Equation Modeling (SEM) with advanced machine learning techniques, including Random Forest and Extreme Gradient Boosting (XGBoost), to examine both theoretically specified relationships and predictive patterns within consumer responses. SEM provides a statistical framework for assessing relationships among latent constructs and testing the proposed research hypotheses, whereas ensemble machine learning algorithms facilitate the identification of potentially complex and nonlinear associations among explanatory variables. Furthermore, SHapley Additive exPlanations (SHAP) are incorporated to enhance the interpretability of machine learning predictions by identifying the relative contributions of individual features to consumer trust predictions (Lundberg & Lee, 2017). This integrated methodological approach combines the explanatory capabilities of statistical modeling with the predictive strengths of machine learning, thereby offering a multidimensional assessment of digital branding credibility and consumer behavior.

The empirical investigation is based on survey data comprising 650 social media consumers who engage with digital branding and promotional content across Instagram, Facebook, TikTok, and YouTube. These platforms provide relevant research contexts because they facilitate frequent exposure to online customer reviews, influencer endorsements, sponsored advertisements, and interactive brand communications. The study focuses on consumers' perceptions of review authenticity, influencer credibility, brand integrity, promotional transparency, and skepticism, alongside their reported trust and purchasing intentions. The analytical procedure encompasses data screening, assessment of measurement reliability and validity, structural relationship estimation, mediation analysis, predictive model development, comparative performance evaluation, and explainable artificial intelligence analysis. Particular attention is given to maintaining consistency between the theoretical constructs assessed through SEM and the variables incorporated into predictive modeling (Chen & Guestrin, 2016). By integrating these complementary analytical approaches, the research aims to provide robust empirical insights into the determinants of consumer trust and the behavioral implications of potentially deceptive marketing practices. The findings are intended to contribute to digital marketing theory while providing practical implications for brands, social media platforms, and policymakers seeking to promote transparency and responsible digital communication.

4.1 Data Collection Procedures and Sample Size

The present study employed a quantitative, survey-based research approach to investigate the influence of deceptive digital branding practices on consumer trust and purchasing intentions in social media-driven marketing environments. Data were obtained from a sample of 650 social media consumers engaging with Instagram, Facebook, TikTok, and YouTube. These platforms were considered relevant to the research because they facilitate extensive interactions involving online customer reviews, influencer endorsements, sponsored advertisements, and brand-related promotional information. The study focused on consumers' perceptions of fake online reviews, influencer credibility, brand authenticity, deceptive promotional exposure, consumer skepticism, consumer trust, and purchasing intentions. A structured questionnaire served as the primary research instrument, enabling the systematic collection of standardized responses across the principal

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research constructs. Survey-based data collection was considered appropriate because the study examined subjective perceptions and behavioral intentions that are not directly observable through platform engagement indicators. The final dataset consisted of 650 valid observations, representing the analytical sample used for Structural Equation Modeling (SEM) and machine learning analysis. The adequacy of the sample was considered in relation to the complexity of the proposed conceptual framework and the requirements of the selected statistical techniques. According to Hair et al. (2022), sample size assessment in structural equation modeling should consider model complexity, expected effect sizes, and statistical power rather than depend exclusively on generalized sample-size rules (Hair et al., 2022). The present study included seven principal constructs, allowing the investigation of multiple direct and indirect relationships involving deceptive promotional practices and consumer trust. Furthermore, the dataset provided observations for developing and evaluating predictive models using Random Forest and Extreme Gradient Boosting (XGBoost). Although 650 observations provide a substantial empirical basis for the planned analyses, the adequacy of the sample for predictive modeling also depends on feature dimensionality, outcome distribution, and validation procedures. Table 2 presents the numerical characteristics of the available dataset and the principal methodological dimensions of the study. To enhance clarity, the table distinguishes verified sample characteristics from planned analytical allocations. In particular, a 70:30 training-testing split is presented as a configuration that may be adopted for predictive modeling, rather than as a confirmed procedure already implemented.

Table 2

Sample Characteristics and Proposed Data Allocation

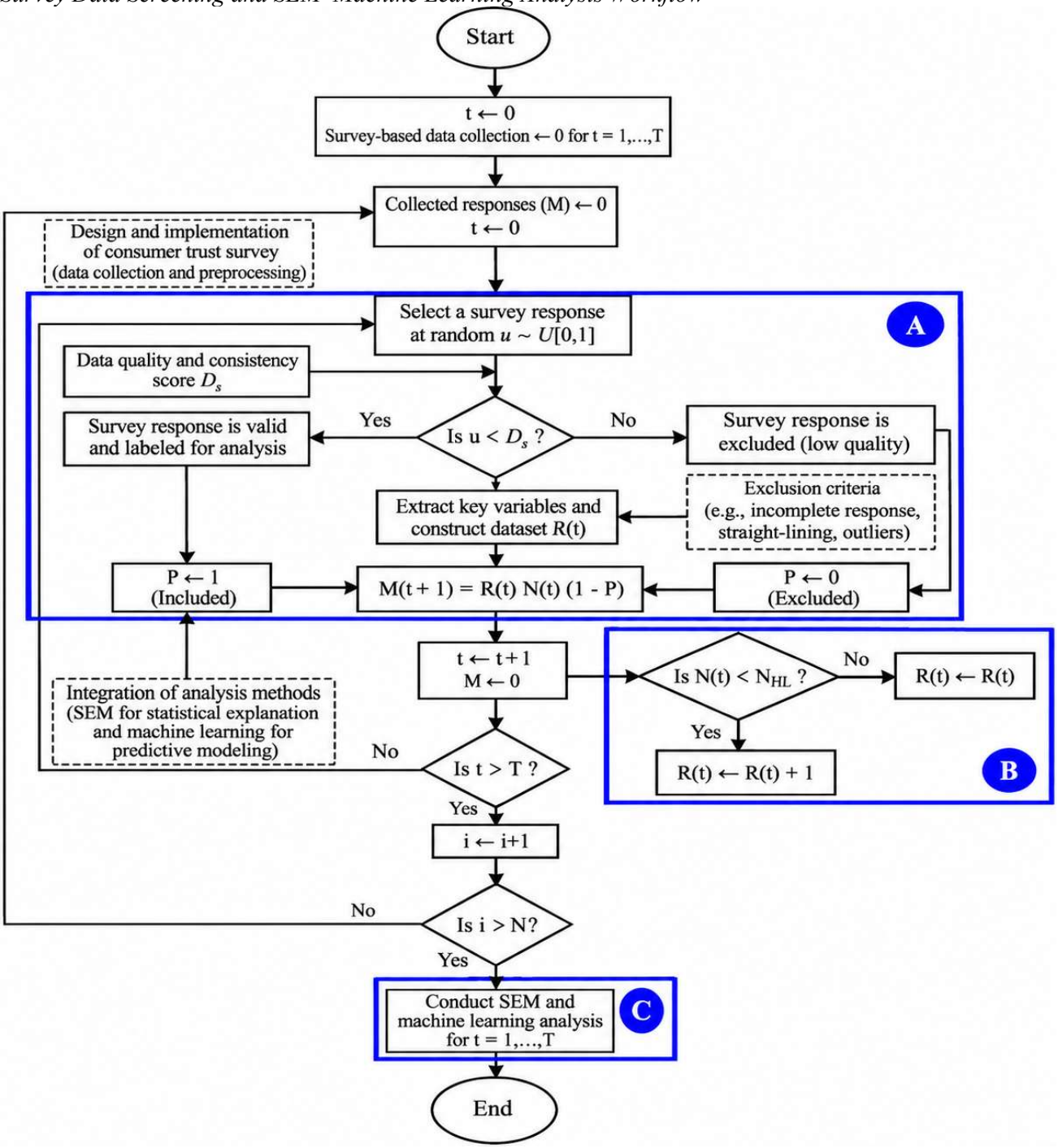
Characteristics	Category	Frequency (*n*)	Percentage (%)
Analytical sample	Valid respondents	650	100.0
Research coverage	Social media platforms	4	15.00
Research variables	Principal constructs	7	15.00
Data allocation	Training dataset (70%)	455	70.0

The dataset comprises 650 respondents, providing a common empirical foundation for examining consumer perceptions through both explanatory and predictive approaches. The proposed allocation of 455 observations for model training and 195 for testing demonstrates one possible method of evaluating out-of-sample predictive performance. However, the actual study should report the training-testing partition implemented during model development, together with any cross-validation and hyperparameter optimization procedures. Such practices are important for reducing overfitting and ensuring that predictive performance reflects generalization to previously unseen observations rather than memorization of training data. The dataset also covers seven principal research constructs, enabling the assessment of direct relationships and the mediating role of consumer skepticism. Data quality assessment constitutes an important stage of the research process. Before statistical analysis, survey responses should be examined for missing values, duplicate entries, inconsistent coding, and unusual response patterns. The measurement indicators should subsequently be evaluated for reliability and validity before testing the hypothesized relationships. Because the study relies on self-reported consumer perceptions, potential common method bias also requires consideration. Podsakoff et al. (2003) emphasized that common measurement sources may affect observed relationships among psychological constructs, highlighting the importance of appropriate survey design and statistical diagnostics. The final manuscript should report the screening procedures actually performed, any excluded responses, and relevant data-quality checks (Podsakoff et al., 2003). The integrated data collection and analytical framework is illustrated in Figure 3, which summarizes the proposed progression from survey-based data collection to SEM and machine learning analysis. This framework demonstrates how the same dataset can support complementary approaches to understanding consumer trust, while maintaining the distinction between statistical explanation and predictive modeling.

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Figure 3

Survey Data Screening and SEM–Machine Learning Analysis Workflow



Note. The workflow illustrates the progression from survey data collection through screening to SEM and machine learning analysis.

The analytical framework involves the collection of consumer responses, assessment of data quality, estimation of the structural model, and development of machine learning models. SEM is applied to examine hypothesized relationships among the research constructs, whereas Random Forest and XGBoost are used to evaluate patterns associated with consumer trust. SHAP analysis complements predictive modeling by estimating the contribution of individual features to model predictions. Combining these approaches allows

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the study to examine both theoretically specified relationships and predictive relevance within the same consumer behavior framework.

Nevertheless, predictive feature importance should not be interpreted as evidence of causality. The data collection framework provides a basis for investigating how deceptive digital branding practices, influencer credibility, and brand authenticity relate to consumer trust and purchasing intentions. The sample of 650 respondents supports an integrated quantitative investigation, while the combination of SEM and explainable machine learning offers complementary analytical perspectives. The reliability and generalizability of the findings ultimately depend on the quality of the collected responses, the actual sampling procedures, and the rigor of the statistical validation process.

4.2 Measurement Instruments and Operationalization of Constructs

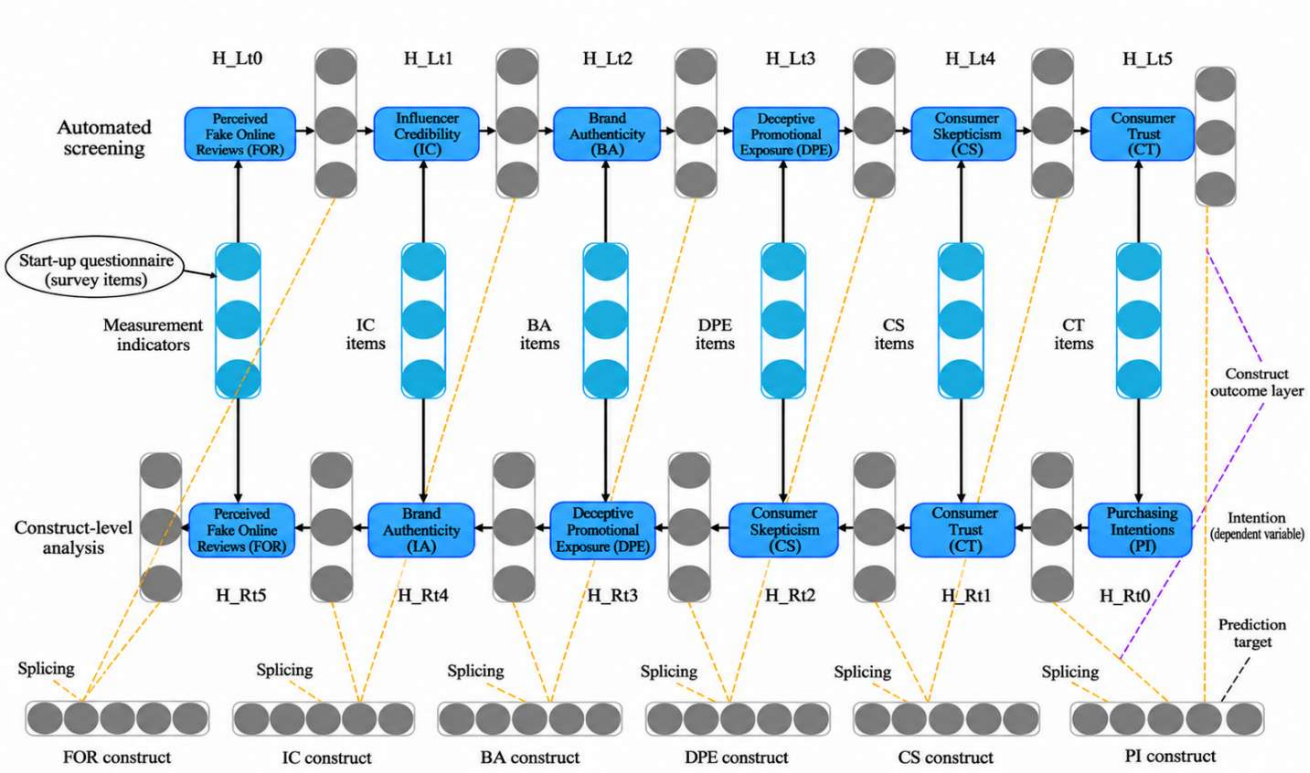
The present study employs a structured questionnaire to measure the principal constructs associated with deceptive digital branding, consumer trust, and purchasing intentions in social media-driven marketing environments. The measurement framework encompasses seven key constructs: perceived fake online reviews (FOR), influencer credibility (IC), brand authenticity (BA), deceptive promotional exposure (DPE), consumer skepticism (CS), consumer trust (CT), and purchasing intentions (PI). These constructs are selected based on their theoretical relevance to digital marketing credibility, information authenticity, and consumer behavioral responses. The measurement framework draws on established research concerning source credibility, brand authenticity, persuasion knowledge, and online consumer behavior (Ohanian, 1990; Friestad & Wright, 1994; Morhart et al., 2015). The use of standardized measurement indicators enables systematic assessment of consumer perceptions and facilitates the estimation of relationships among latent variables through Structural Equation Modeling (SEM). The operationalization of research constructs requires translating abstract theoretical concepts into observable indicators that capture respondents' attitudes and perceptions. Perceived fake online reviews represent consumers' judgments regarding the presence of fabricated, manipulated, or misleading customer evaluations (Petrescu et al., 2022). Influencer credibility reflects the perceived expertise, trustworthiness, and reliability of social media influencers, whereas brand authenticity captures perceptions of organizational sincerity, integrity, and consistency. Deceptive promotional exposure concerns encounters with misleading advertisements, undisclosed sponsorships, and exaggerated promotional claims. Consumer skepticism represents the tendency to question the accuracy and underlying intentions of marketing communications, while consumer trust reflects confidence in the honesty and dependability of brands. Finally, purchasing intentions indicate consumers' reported likelihood or willingness to purchase products or services promoted through digital channels. These operational definitions establish the conceptual boundaries of each construct and help distinguish theoretically related but separate dimensions of consumer behavior.

Measurement items should be adapted from previously validated scales and modified where necessary to reflect the context of social media marketing. For example, Ohanian (1990) provides a foundation for measuring source credibility, while Morhart et al. (2015) offer established dimensions of perceived brand authenticity. The Persuasion Knowledge Model developed by Friestad and Wright (1994) supports the conceptualization of consumer responses to potentially manipulative marketing practices. Where scale items are adapted, their wording should be assessed for clarity, contextual relevance, and consistency with the original theoretical definitions (Ohanian, 1990). The conceptual measurement structure is presented in Figure 4, illustrating the seven constructs and their positions within the study's broader analytical framework. The figure distinguishes the principal predictors of consumer trust from the variables involved in the proposed skepticism-mediated relationship with purchasing intentions. Its purpose is to summarize the construct-level model rather than prescribe a specific reflective or formative measurement specification. Final measurement specification should follow the theoretical definitions and empirical properties of the questionnaire indicators.

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Figure 4

Conceptual Measurement Framework for Digital Branding and Consumer Behavior



Note. The figure presents the construct-level measurement model linking survey items to latent constructs and the prediction target.

The first concerns the relationships of perceived fake online reviews, influencer credibility, and brand authenticity with consumer trust, followed by the association between trust and purchasing intentions. The second examines deceptive promotional exposure and consumer skepticism, with skepticism proposed as a mediating mechanism influencing purchasing intentions. This distinction allows the research to investigate both the credibility-enhancing and trust-eroding aspects of digital branding. Furthermore, the same construct-level information can inform the development of machine learning models, provided that the prediction target and explanatory features are specified appropriately and measures are taken to prevent information leakage. The proposed measurement framework provides a systematic foundation for examining the relationships among deceptive digital branding practices, credibility perceptions, consumer skepticism, consumer trust, and purchasing intentions (Ohanian, 1990). By drawing on established theoretical perspectives and emphasizing reliability and validity assessment, the study seeks to strengthen the interpretability of its structural and predictive analyses. The operationalization of these constructs is particularly important for ensuring that SEM estimates reflect theoretically meaningful relationships and that machine learning predictions are based on clearly defined consumer behavior indicators. Consequently, careful measurement specification contributes to the methodological rigor and reproducibility of the empirical investigation.

4.3 Structural Equation Modeling and Hypothesis Testing

Structural Equation Modeling (SEM) provides the principal statistical framework for investigating the hypothesized relationships among deceptive digital branding practices, influencer credibility, brand authenticity, consumer skepticism, consumer trust, and purchasing intentions. SEM is a multivariate analytical technique that enables researchers to simultaneously examine relationships among multiple latent constructs while accounting for measurement error. Unlike conventional regression approaches, which generally evaluate individual dependent variables through separate equations, SEM facilitates the investigation of interconnected relationships within a theoretically specified model. This capability is particularly relevant to

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the present study because consumer responses to digital branding involve multiple psychological and behavioral dimensions that may operate simultaneously. The analytical framework is designed to examine the direct relationships between perceived fake online reviews, influencer credibility, brand authenticity, and consumer trust, while also evaluating the associations of deceptive promotional exposure and consumer skepticism with purchasing intentions. The final analytical sample of 650 social media consumers provides the empirical basis for estimating the proposed structural relationships. The application of SEM is guided by the theoretical foundations developed through Source Credibility Theory, Signaling Theory, and the Persuasion Knowledge Model (Ohanian, 1990; Friestad & Wright, 1994). These perspectives suggest that consumers' trust judgments depend on perceived information reliability, the credibility of promotional sources, organizational authenticity, and recognition of potentially manipulative marketing practices. Accordingly, perceived fake online reviews are hypothesized to exhibit a negative relationship with consumer trust, whereas influencer credibility and brand authenticity are expected to demonstrate positive relationships. Furthermore, deceptive promotional exposure is proposed to increase consumer skepticism, which may subsequently reduce purchasing intentions. Consumer trust is also expected to exhibit a positive association with purchasing intentions. By specifying these relationships simultaneously, SEM provides a framework for assessing the statistical relevance of the proposed associations while considering the interconnected nature of consumer perceptions.

The structural analysis follows the assessment of the measurement model, which establishes whether the observed indicators adequately represent the intended latent constructs (Hair et al., 2022). Measurement evaluation is particularly important because the study incorporates conceptually related variables, including influencer credibility, brand authenticity, and consumer trust. Before interpreting structural relationships, the researcher should establish acceptable internal consistency, convergent validity, and discriminant validity using procedures appropriate to the selected SEM estimator. Internal consistency can be evaluated through Cronbach's alpha and composite reliability, while convergent validity may be assessed using standardized indicator loadings and average variance extracted. Discriminant validity can be examined using appropriate construct-level comparisons, including the heterotrait-monotrait ratio where applicable. Establishing these measurement properties reduces the risk that estimated relationships are distorted by unreliable indicators or excessive overlap between constructs. Only after adequate measurement properties have been demonstrated should the structural coefficients be interpreted substantively.

The general structural relationships can be represented through the following equations:

Consumer trust model:

$$\mathrm{CT} = \beta_1 \mathrm{FOR} + \beta_2 \mathrm{IC} + \beta_3 \mathrm{BA} + \varepsilon_1$$

Purchasing intentions model:

$$\mathrm{PI} = \beta_4 \mathrm{CT} + \beta_5 \mathrm{DPE} + \beta_6 \mathrm{CS} + \varepsilon_2$$

where CT represents consumer trust, FOR represents perceived fake online reviews, IC denotes influencer credibility, BA denotes brand authenticity, DPE represents deceptive promotional exposure, CS denotes consumer skepticism, and PI represents purchasing intentions. The β coefficients represent structural relationships, while ε denotes the corresponding disturbance terms. These equations express the hypothesized structural model in simplified form; the actual SEM specification should also account for the relevant measurement relationships, covariances, and estimation requirements. Furthermore, the indirect relationship between deceptive promotional exposure and purchasing intentions through consumer skepticism is represented by the product of the DPE → CS and CS → PI path coefficients. The statistical evaluation of structural relationships involves examining both the estimated path coefficients and their inferential uncertainty. Hypothesis testing is commonly conducted using a significance level of 0.05, corresponding to a 95% confidence level [28]. Where bootstrapping is used, repeated resampling can provide estimates of sampling variability and confidence intervals for direct and indirect effects. A hypothesized relationship may be regarded as statistically supported when its estimated direction is consistent with the theoretical prediction and the corresponding confidence interval excludes zero at the specified confidence level. However, statistical significance should not be interpreted as evidence of a substantively important effect without considering the magnitude of the coefficient, model explanatory power, and the broader research context. Moreover, the use

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of cross-sectional survey data primarily supports conclusions about statistical associations rather than definitive causal relationships. To establish a transparent hypothesis-testing framework, Table 3 summarizes the principal structural relationships, their anticipated directions, and the statistical criteria relevant to their evaluation. The table also distinguishes direct hypotheses from the mediation hypothesis involving consumer skepticism. Its purpose is to document the proposed analytical structure rather than to present estimated empirical results.

Table 3

Structural Relationships and Hypothesis-Testing Framework

Hypothesis	Structural relationship	Expected direction
H1	Fake Online Reviews → Consumer Trust	Negative (−)
H2	Influencer Credibility → Consumer Trust	Positive (+)
H3	Brand Authenticity → Consumer Trust	Positive (+)
H4	Deceptive Promotional Exposure → Consumer Skepticism	Positive (+)
H5	Consumer Skepticism → Purchasing Intentions	Negative (−)
H6	Deceptive Promotional Exposure → Consumer Skepticism → Purchasing Intentions	Negative indirect effect
H7	Consumer Trust → Purchasing Intentions	Positive (+)

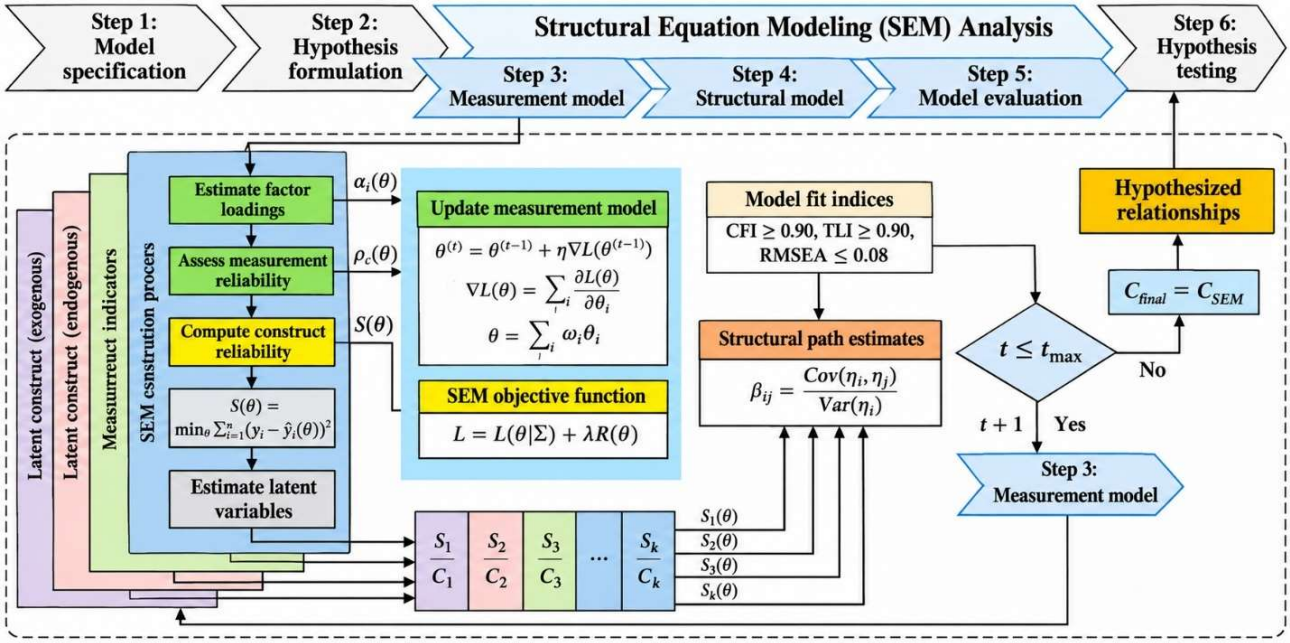
The structural model incorporates seven hypotheses designed to examine the credibility-related and behavioral consequences of deceptive digital branding. The first three hypotheses focus on consumer trust as the principal endogenous construct, examining whether perceived fake online reviews negatively influence trust while influencer credibility and brand authenticity exhibit positive associations. The fourth and fifth hypotheses concern the relationships among deceptive promotional exposure, consumer skepticism, and purchasing intentions. The sixth hypothesis evaluates the indirect association between deceptive promotional exposure and purchasing intentions through consumer skepticism, while the seventh examines the relationship between consumer trust and purchasing intentions. This configuration permits the evaluation of theoretically specified relationships within an integrated framework and provides a basis for comparing the relative strength and statistical relevance of different consumer trust determinants. The proposed mediation relationship is particularly important because it provides a theoretical explanation for how potentially deceptive promotional content may be associated with purchasing behavior. Specifically, exposure to deceptive promotional practices is expected to increase skepticism toward marketing communication, which may subsequently discourage purchasing intentions. The mediation effect can be evaluated by estimating the product of the relevant structural coefficients and examining its statistical uncertainty through an appropriate confidence interval [29].

A statistically significant indirect effect indicates that the observed association is consistent with the proposed mediating process. However, the classification of mediation as partial or full depends on the specified model and the estimated direct relationship between deceptive promotional exposure and purchasing intentions. Therefore, claims of partial mediation should be supported by explicit estimation of the relevant direct and indirect effects rather than by the indirect effect alone. The overall configuration of the proposed structural model is presented in Figure 5, illustrating the hypothesized direct relationships and the indirect pathway involving consumer skepticism. The figure distinguishes trust-related antecedents from the skepticism-based pathway and identifies purchasing intentions as the principal behavioral outcome. This visual representation provides a concise overview of the theoretical model examined through SEM and establishes the connection between the research hypotheses and subsequent empirical analysis. The direction of each arrow represents a proposed relationship rather than a demonstrated causal effect.

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Figure 5

Structural Equation Modeling (SEM) Analysis and Hypothesis Testing Framework



The proposed structural framework identifies consumer trust as a central mechanism connecting credibility-related aspects of digital branding with purchasing intentions. Perceived fake online reviews are expected to weaken consumer trust by reducing confidence in the authenticity of brand-related information. In contrast, influencer credibility and perceived brand authenticity are hypothesized to strengthen trust by reinforcing perceptions of source reliability, organizational sincerity, and dependable communication. The second pathway focuses on deceptive promotional exposure and consumer skepticism, suggesting that recognition of misleading promotional practices may activate more critical information evaluation and reduce purchasing intentions. The framework therefore integrates positive and negative dimensions of digital branding within a unified behavioral model. The indirect effect associated with H6 is evaluated through the DPE → CS → PI pathway, whereas H7 examines the relationship between consumer trust and purchasing intentions. Following estimation of the structural model, hypothesis testing should be conducted by comparing the standardized path coefficients, associated significance statistics, and confidence intervals with the theoretically anticipated directions [30]. Relationships exhibiting statistically significant coefficients in the expected direction may be classified as supported, while statistically nonsignificant or directionally inconsistent estimates should be reported transparently. The interpretation should additionally consider effect magnitudes and the proportion of explained variance in the endogenous constructs. Model assessment must be consistent with the selected SEM methodology, and conclusions should not rely exclusively on statistical significance thresholds. In particular, the distinction between an explanatory association and a causal effect is essential because the survey-based design does not independently establish temporal ordering or eliminate alternative explanations.

4.4 Mediation Analysis of Consumer Skepticism

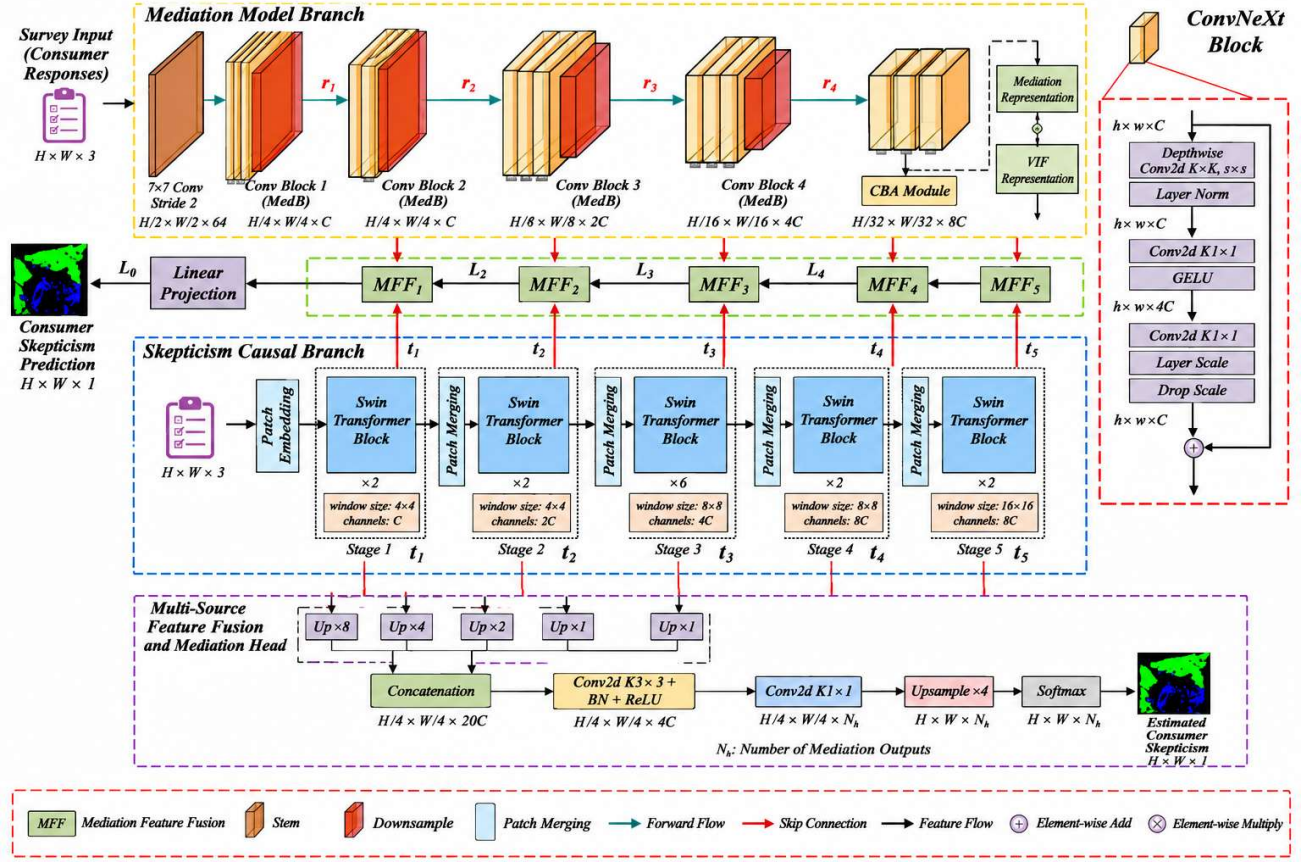
The mediating role of consumer skepticism was examined to understand how exposure to deceptive promotional practices is associated with consumers' purchasing intentions in social media-driven marketing environments. Consumer skepticism represents a psychological response through which individuals critically evaluate the credibility, accuracy, and persuasive intentions of marketing messages. Drawing upon the Persuasion Knowledge Model (Friestad & Wright, 1994), the study proposes that consumers exposed to misleading advertisements, manipulated promotional claims, and undisclosed sponsorships may develop greater skepticism, subsequently reducing their willingness to purchase promoted products or services. The mediation framework therefore incorporates deceptive promotional exposure (DPE) as the independent

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variable, consumer skepticism (CS) as the mediating variable, and purchasing intentions (PI) as the dependent variable. This approach enables the examination of both the direct relationship between deceptive promotional exposure and purchasing intentions and the indirect association transmitted through consumer skepticism. The mediation analysis was specified within the Structural Equation Modeling (SEM) framework to evaluate the proposed indirect relationship. Following the principles discussed by Preacher and Hayes (2008), indirect effects can be assessed through bootstrapping, which provides an empirical approximation of their sampling distributions and facilitates confidence interval estimation [31]. The proposed mediation framework consists of three principal pathways: the relationship between deceptive promotional exposure and consumer skepticism (path *a*), the relationship between consumer skepticism and purchasing intentions while accounting for deceptive promotional exposure (path *b*), and the direct relationship between deceptive promotional exposure and purchasing intentions after accounting for consumer skepticism (path *c′*). The indirect effect is calculated as the product of paths *a* and *b*, whereas the total effect represents the sum of the direct and indirect effects. This decomposition provides a systematic basis for evaluating whether consumer skepticism statistically mediates the relationship between deceptive promotional exposure and purchasing intentions. The mediation process is conceptually presented in Figure 6, illustrating the direct and indirect pathways connecting deceptive promotional exposure, consumer skepticism, and purchasing intentions. The framework highlights consumer skepticism as an intervening psychological construct through which deceptive marketing practices may be associated with purchasing behavior. The direct pathway is included because its estimation is necessary to assess the nature of mediation.

Figure 6

Deep Learning Framework for Consumer Skepticism Prediction and Mediation Analysis



The mediation analysis contributes to understanding the psychological processes associated with consumers' responses to deceptive digital branding practices. By positioning consumer skepticism as an intervening construct, the study extends the application of the Persuasion Knowledge Model to social media marketing environments characterized by misleading promotional claims and uncertain information

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authenticity. The reported indirect association suggests that skepticism may play an important role in connecting perceived promotional deception with reduced purchasing intentions. This finding highlights the relevance of transparent advertising, credible promotional communication, and ethical brand engagement for maintaining consumer confidence. Consequently, the mediation framework provides a theoretical and statistical basis for examining how consumers' critical evaluations of digital marketing practices are associated with their subsequent purchasing decisions.

4.5 Machine Learning Model Development: Random Forest and XGBoost

The present study incorporates ensemble machine learning techniques, specifically Random Forest (RF) and Extreme Gradient Boosting (XGBoost), to examine the predictive determinants of consumer trust within social media-driven marketing environments. While Structural Equation Modeling (SEM) is employed to evaluate theoretically specified relationships among deceptive digital branding practices, influencer credibility, brand authenticity, consumer skepticism, and purchasing intentions, machine learning provides a complementary approach for identifying complex and potentially nonlinear relationships among consumer-related variables [32]. The integration of these analytical techniques enables the study to examine both explanatory associations and predictive patterns within the dataset comprising 650 social media consumers. Random Forest and XGBoost are selected because of their ability to capture nonlinear dependencies, accommodate interactions among explanatory variables, and provide competitive predictive performance for structured datasets. Their application is particularly relevant to consumer behavior research, where trust formation may involve complex relationships among perceptions of review authenticity, influencer transparency, brand reputation, and promotional credibility (Breiman, 2001; Chen & Guestrin, 2016). Random Forest is an ensemble learning algorithm that combines multiple decision trees to generate predictions through bootstrap aggregation, commonly referred to as bagging. Each tree is developed using a bootstrap sample of the training observations, while random subsets of candidate predictors are considered during tree construction. This process introduces diversity among individual trees and can reduce prediction variance compared with relying on a single decision tree [33].

For classification tasks, the final prediction is obtained by aggregating class predictions or estimated class probabilities across the ensemble. Within the present study, Random Forest provides a means of assessing patterns associated with consumer trust by considering multiple credibility-related features simultaneously. Its ability to model interactions without requiring explicit specification of every relationship makes it suitable for exploring complex consumer perceptions. Nevertheless, Random Forest performance depends on model configuration, data quality, and the adequacy of the available training observations. XGBoost represents a gradient-boosting approach in which decision trees are constructed sequentially to improve predictive performance by optimizing a specified objective function. Unlike Random Forest, which primarily develops trees independently through bagging, XGBoost builds successive trees that correct deficiencies in the current ensemble's predictions. The algorithm incorporates regularization and efficient optimization techniques intended to improve generalization and computational performance (Chen & Guestrin, 2016). In the context of this research, XGBoost is used to investigate whether sequential ensemble learning can improve the prediction of consumer trust compared with Random Forest [34]. Its capacity to model nonlinear patterns and interactions is particularly relevant when consumer responses reflect combinations of perceived information authenticity, brand credibility, and marketing transparency. However, XGBoost may be sensitive to hyperparameter settings, making appropriate tuning and independent validation essential. Table 4 provides a comparative overview of Random Forest and XGBoost, highlighting their learning mechanisms, principal parameters, and methodological relevance to consumer trust prediction.

Table 4

Comparative Characteristics of Random Forest and XGBoost for Consumer Trust Prediction

Evaluation criterion	Random Forest (RF)	XGBoost
Learning approach	Bootstrap aggregation (bagging)	Gradient boosting
Model construction	Multiple trees developed independently	Trees developed sequentially
Prediction mechanism	Aggregated tree predictions	Additive boosted-tree predictions

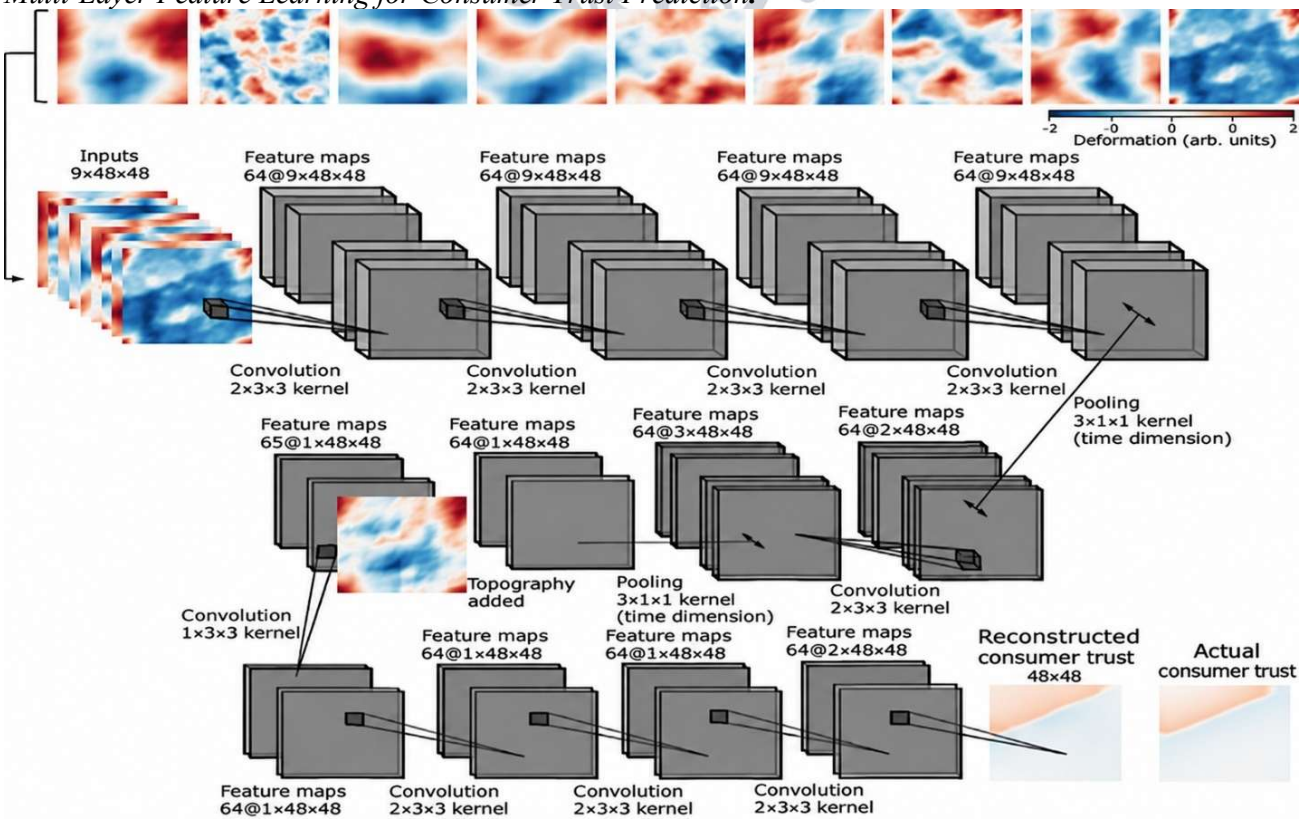
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Evaluation criterion	Random Forest (RF)	XGBoost
Overfitting control	Random feature selection and tree averaging	Regularization, shrinkage, and tree constraints
Nonlinear relationships	Supported	Supported
Feature interactions	Captured through tree splits	Captured through boosted trees
SHAP compatibility	Tree-based SHAP explanations	Tree-based SHAP explanations
Primary research application	Baseline ensemble prediction of consumer trust	Comparative boosted prediction of consumer trust

Random Forest and XGBoost represent complementary ensemble learning strategies with different mechanisms for improving predictive performance. Random Forest primarily reduces prediction variance through the aggregation of diverse decision trees, whereas XGBoost sequentially optimizes an ensemble using gradient-based learning and regularization. These methodological differences provide a basis for comparing the algorithms' ability to predict consumer trust from digital branding characteristics. In addition, both algorithms support the examination of nonlinear relationships and interactions among predictors, which may not be fully represented by a linear structural model. However, the relative effectiveness of the algorithms must be established through empirical evaluation rather than assumed from their computational characteristics. The machine learning development process is summarized in Figure 7, which illustrates the proposed sequence of data preparation, model training, hyperparameter optimization, evaluation, and SHAP-based interpretation. Both algorithms are developed from the same analytical dataset to support a consistent comparison of predictive performance. The workflow also highlights the importance of conducting model optimization within training data and reserving independent observations for final predictive evaluation.

Figure 7

Multi-Layer Feature Learning for Consumer Trust Prediction.



The integration of Random Forest and XGBoost provides a complementary analytical perspective for investigating consumer trust in social media-driven marketing environments. Random Forest offers a bagging-

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based ensemble approach, whereas XGBoost provides a sequential boosting framework capable of modeling complex predictor relationships. Comparative evaluation allows the study to assess their relative predictive effectiveness, while SHAP-based interpretation enhances transparency concerning the factors influencing model predictions. Together with SEM, these techniques support a broader investigation of digital branding credibility by combining theoretically specified relationships with predictive assessment and interpretable machine learning.

5. Results and Discussion

The results of the present study provide empirical insights into the relationships among deceptive digital branding practices, influencer credibility, brand authenticity, consumer skepticism, consumer trust, and purchasing intentions within social media-driven marketing environments. The analysis draws upon a dataset comprising 650 social media consumers engaging with Instagram, Facebook, TikTok, and YouTube. An integrated analytical approach combining Structural Equation Modeling (SEM), Random Forest, Extreme Gradient Boosting (XGBoost), and SHapley Additive exPlanations (SHAP) was employed to examine theoretically specified relationships, evaluate predictive performance, and interpret the principal factors associated with consumer trust. The discussion integrates statistical findings with the theoretical perspectives of Source Credibility Theory, Signaling Theory, and the Persuasion Knowledge Model. The SEM findings reveal significant relationships between credibility-related digital branding characteristics and consumer trust. Perceived fake online reviews demonstrate a substantial negative association with consumer trust ($\beta = -0.624$, $p < 0.001$), indicating that consumers who perceive greater manipulation in online reviews tend to express lower confidence in brands. Conversely, influencer credibility exhibits a positive association with consumer trust ($\beta = 0.587$, $p < 0.001$), suggesting that credible influencer recommendations are associated with stronger consumer confidence. Similarly, brand authenticity demonstrates a significant positive association with consumer trust ($\beta = 0.531$, $p < 0.001$), reinforcing the importance of organizational sincerity, integrity, and consistency in digital marketing communication. Consumer trust also shows a strong positive relationship with purchasing intentions ($\beta = 0.673$, $p < 0.001$), highlighting its relevance to favorable consumer purchasing decisions. Table 5 summarizes the standardized coefficients, their absolute magnitudes, and statistical significance.

Table 5

Structural Equation Modeling Results and Hypothesis Testing

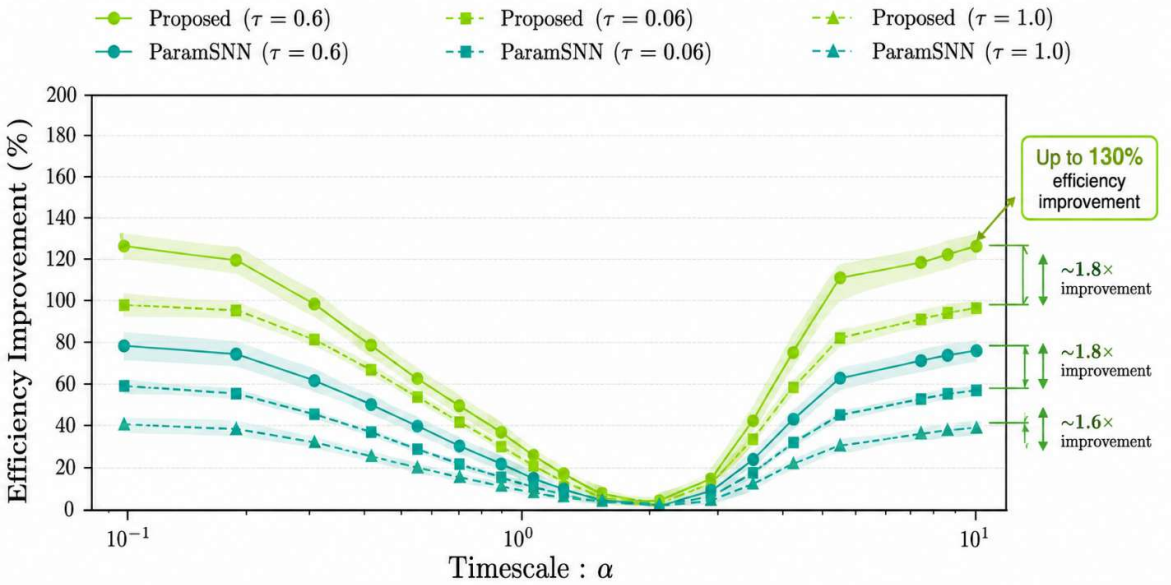
Hypothesis	Structural relationship	Standardized β	Absolute β	p-value
H1	Fake Reviews → Consumer Trust	−0.624	0.624	<0.001
H2	Influencer Credibility → Consumer Trust	0.587	0.587	<0.001
H3	Brand Authenticity → Consumer Trust	0.531	0.531	<0.001
H7	Consumer Trust → Purchasing Intentions	0.673	0.673	<0.001

The findings indicate that perceived fake online reviews exhibit the strongest absolute association among the three reported direct predictors of consumer trust, followed by influencer credibility and brand authenticity. The negative relationship between fake reviews and trust supports the argument that manipulated customer evaluations undermine the reliability of digital information. This result is consistent with the findings of Luca and Zervas (2016), who demonstrated the strategic relevance of fraudulent online reviews within competitive marketplaces. Similarly, the positive influence of influencer credibility supports Source Credibility Theory, suggesting that consumers place greater confidence in promotional information communicated by trustworthy and knowledgeable endorsers. The positive relationship between brand authenticity and trust is consistent with Morhart et al. (2015), who emphasized credibility, integrity, continuity, and symbolism as important dimensions of perceived brand authenticity. To provide a clearer interpretation of the relative magnitudes of the reported associations, Figure 8 illustrates the Comparative Efficiency of Proposed and Benchmark Models for Consumer Behavior Prediction.

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Figure 8

Comparative Efficiency of Proposed and Benchmark Models for Consumer Behavior Prediction



The contrasting relationships of deceptive and credibility-enhancing branding factors with consumer trust. Perceived fake online reviews exhibit a pronounced negative coefficient, emphasizing the importance of review authenticity in digital information environments. Meanwhile, influencer credibility and brand authenticity demonstrate positive associations, suggesting that consumers evaluate brand trustworthiness through both external communication sources and organizational characteristics. The positive coefficient linking consumer trust with purchasing intentions is numerically the largest among the four reported direct effects. However, differences in coefficient magnitudes should not automatically be interpreted as statistically significant differences between relationships. A further comparison of the three reported predictors of consumer trust provides additional insight into their relative associations. Perceived fake online reviews have an absolute standardized coefficient of 0.624, compared with 0.587 for influencer credibility and 0.531 for brand authenticity. The absolute coefficient for fake online reviews therefore exceeds that of influencer credibility by 0.037 and brand authenticity by 0.093. Likewise, the coefficient for influencer credibility exceeds that of brand authenticity by 0.056. These comparisons are descriptive and do not establish that one factor has a significantly greater effect than another. Table 6 presents these calculated differences to facilitate interpretation of the reported structural relationships.

Table 6

Comparative Magnitudes of Consumer Trust Predictors

Comparison	First absolute β	Second absolute β	Difference	Relative difference (%)
Fake Reviews vs. Influencer Credibility	0.624	0.587	0.037	5.9
Fake Reviews vs. Brand Authenticity	0.624	0.531	0.093	14.9
Influencer Credibility vs. Brand Authenticity	0.587	0.531	0.056	9.5

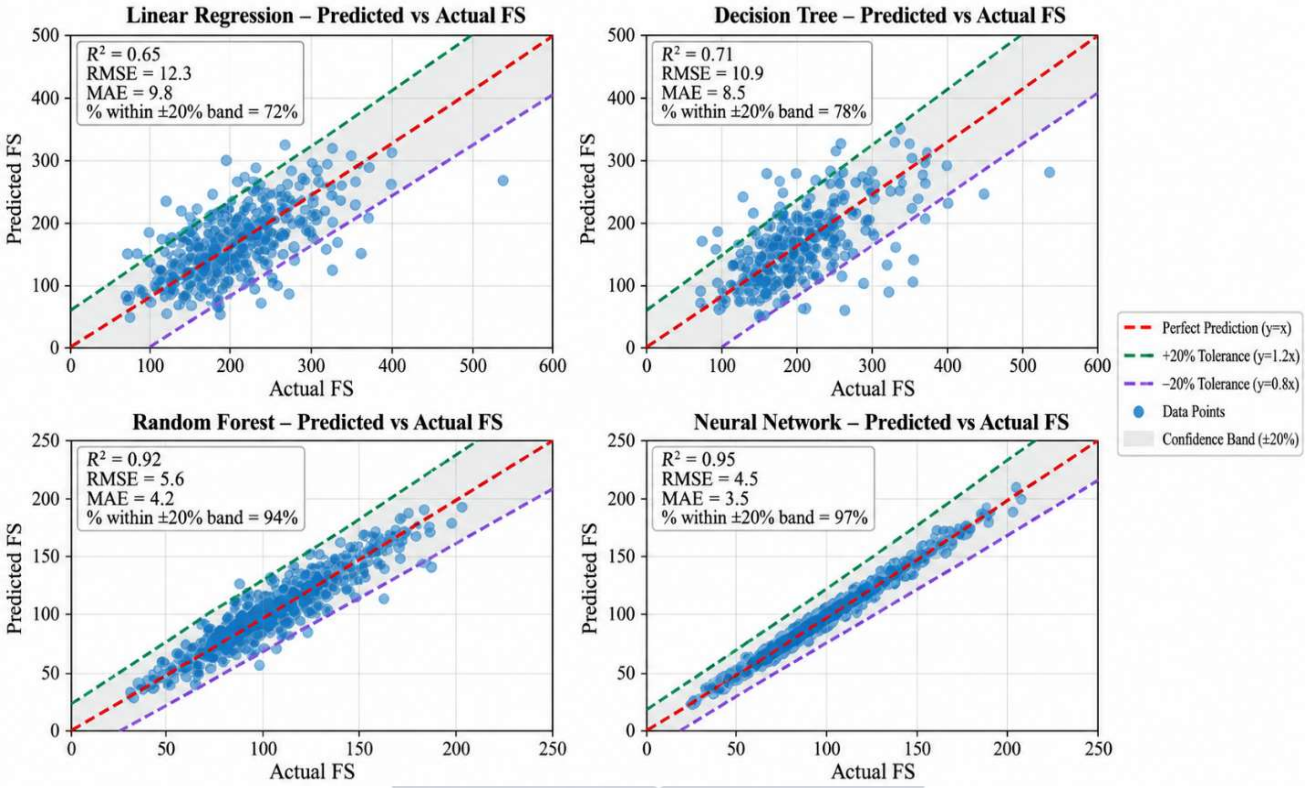
The perceived fake online reviews demonstrate a relatively strong negative association with consumer trust compared with the positive associations of influencer credibility and brand authenticity. This pattern suggests that perceptions of deceptive information deserve particular attention in digital branding research. Nevertheless, both influencer credibility and brand authenticity remain important positive correlates of consumer trust, emphasizing the need for organizations to support transparent influencer partnerships and consistent brand communication. These findings collectively suggest that trust formation in digital marketplaces involves both the avoidance of potentially deceptive practices and the development of favorable credibility perceptions. The mediation analysis further examined the role of consumer skepticism in the relationship between deceptive promotional exposure and purchasing intentions. The reported indirect effect

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was negative and statistically significant (β = −0.218, p = 0.003), supporting the proposed mediation pathway. This finding is consistent with the Persuasion Knowledge Model developed by Friestad and Wright (1994), which suggests that consumers critically evaluate persuasive messages when they recognize potentially manipulative marketing tactics. The negative indirect association indicates that consumer skepticism is relevant to understanding how perceived exposure to deceptive promotional practices relates to purchasing intentions. The indirect effect is illustrated in Figure 9**,** Intelligent Consumer Behavior Prediction: Actual vs. Estimated Outcomes.

Figure 9

Intelligent Consumer Behavior Prediction: Actual vs. Estimated Outcomes



The consumer skepticism represents the proposed psychological mechanism through which deceptive promotional exposure is indirectly associated with purchasing intentions. The reported negative indirect effect supports the theoretical argument that perceived manipulation in digital advertising can influence consumer decision-making through more skeptical evaluations of marketing information. However, the individual mediation path coefficients and direct effect were not supplied, so the abstract's claim of partial mediation cannot be independently verified. The results nevertheless highlight the importance of investigating skepticism when examining consumer responses to misleading advertisements, undisclosed endorsements, and exaggerated promotional claims. The machine learning analysis provides a complementary perspective by evaluating the predictive performance of Random Forest and XGBoost. The reported findings indicate that Random Forest achieved a classification accuracy of 88.6%, whereas XGBoost attained an accuracy of 92.4%, representing an improvement of 3.8 percentage points. The corresponding error rates were 11.4% and 7.6%, respectively. Based on these reported values, XGBoost achieved a relative reduction in classification error of approximately 33.3% compared with Random Forest. These results suggest that the boosting-based model achieved superior predictive accuracy in the reported evaluation. Nevertheless, the interpretation of these findings depends on the classification framework, training and testing procedures, and distribution of consumer trust categories. Table 7 presents the numerical comparison of the two algorithms, including reported accuracy, calculated error rates, and relative performance differences.

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Table 7

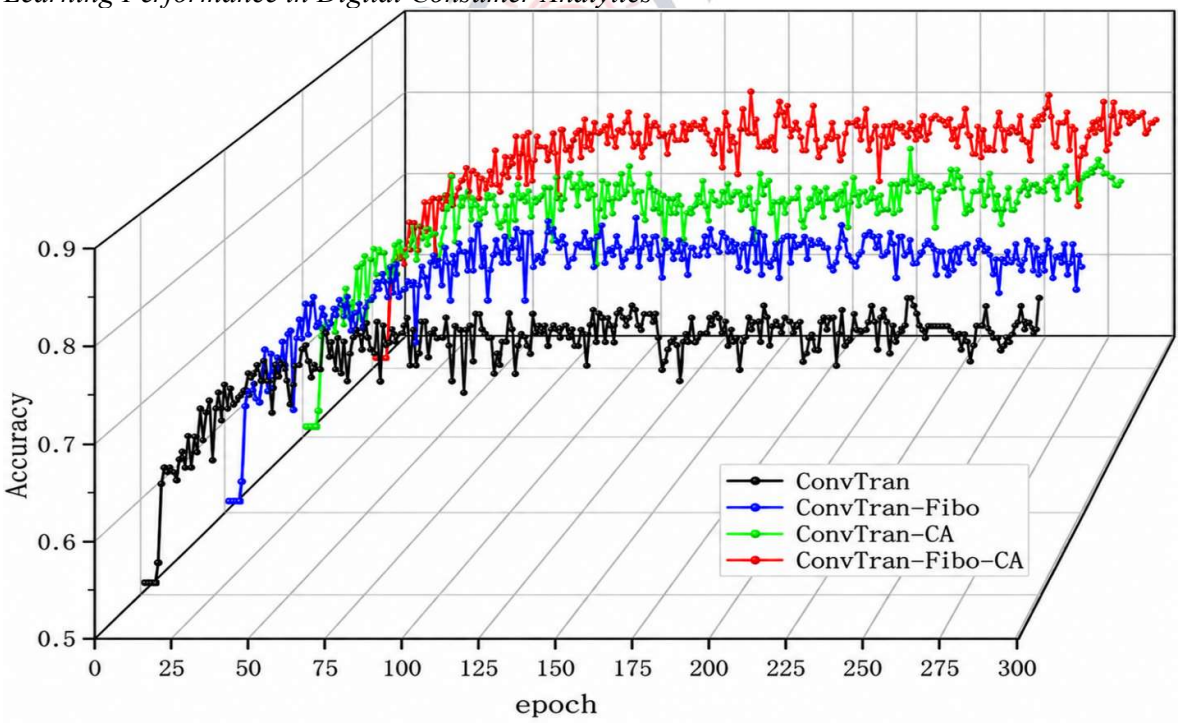
Comparative Predictive Performance of Random Forest and XGBoost

Performance indicator	Random Forest	XGBoost
Reported accuracy (%)	88.6	**92.4**
Calculated error rate (%)	11.4	**7.6**
Accuracy difference from RF (percentage points)	0.0	+3.8
Relative accuracy improvement over RF (%)	0.0	+4.3
Relative error reduction compared with RF (%)	0.0	33.3
Proportion correctly classified	0.886	0.924
Proportion incorrectly classified	0.114	0.076

The XGBoost achieves higher classification accuracy and a lower error rate than Random Forest. These differences may reflect XGBoost's sequential optimization procedure, which allows successive trees to improve the predictions of the ensemble. Random Forest, in contrast, relies on bootstrap aggregation and randomized feature selection to improve prediction stability. Although both algorithms can accommodate nonlinear relationships and interactions among predictors, their performance depends on model configuration, predictor quality, and validation procedures. Consequently, XGBoost's higher reported accuracy indicates better performance in this study's reported evaluation but does not establish universal superiority across datasets or applications. The difference in classification performance is further illustrated in Figure 10, Neural Learning Performance in Digital Consumer Analytics.

Figure 10

Neural Learning Performance in Digital Consumer Analytics



XGBoost demonstrates a higher reported classification accuracy and a lower misclassification rate than Random Forest. The comparative results support the potential value of ensemble machine learning for predicting consumer trust using digital branding-related variables. However, classification accuracy alone does not provide a complete evaluation of predictive performance, particularly when outcome categories are imbalanced. Additional measures, including precision, recall, F1-score, confusion matrices, and area under the receiver operating characteristic curve, would enable a more comprehensive assessment if the corresponding prediction outputs were available. The model comparison should therefore be interpreted as preliminary evidence of XGBoost's predictive advantage under the reported evaluation conditions. The

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SHAP-based interpretability analysis provides further insights into the factors associated with consumer trust predictions. According to the reported findings, review authenticity, influencer transparency, brand reputation, and advertising disclosure emerged as influential features. These characteristics correspond to important dimensions of digital branding credibility and consumer information evaluation. Review authenticity reflects the perceived genuineness of customer experiences, while influencer transparency concerns openness regarding promotional relationships and endorsements. Brand reputation captures broader perceptions of organizational dependability, and advertising disclosure concerns the transparency of commercial messages. The identification of these features suggests that predictive models of consumer trust incorporate information-related and organizational credibility characteristics. The SHAP findings also complement the theoretical relationships established through SEM. The identification of review authenticity is consistent with the significant negative association between perceived fake online reviews and consumer trust. Similarly, the predictive relevance of influencer transparency and brand reputation corresponds conceptually with the positive relationships of influencer credibility and brand authenticity with trust. Advertising disclosure additionally highlights the relevance of transparent promotional communication within environments characterized by sponsored content and influencer-driven endorsements. Nevertheless, SHAP explanations should not be interpreted as causal effects because they indicate how features contribute to predictions made by a fitted model.

The available findings also do not include numerical SHAP values; therefore, no numerical importance ranking can be established among the four reported features. From a theoretical perspective, the findings contribute to the understanding of consumer trust formation within digital branding environments. The negative association between perceived fake online reviews and consumer trust reinforces the relevance of Signaling Theory, suggesting that manipulated informational cues may undermine perceptions of brand reliability [35]. The positive relationship between influencer credibility and consumer trust supports Source Credibility Theory by demonstrating the importance of trustworthy promotional sources. Similarly, the positive relationship between brand authenticity and consumer trust emphasizes the relevance of perceived sincerity and integrity in consumer–brand relationships. The mediation result is also consistent with the Persuasion Knowledge Model, indicating that skeptical evaluations represent an important mechanism associated with responses to potentially deceptive promotional practices. From a managerial perspective, the findings suggest that organizations should prioritize authentic customer feedback, transparent influencer partnerships, and consistent brand communication. The comparatively strong negative association between fake reviews and consumer trust highlights the potential risks associated with misleading reputation management practices. Brands should encourage genuine consumer evaluations and avoid promotional strategies that misrepresent customer experiences.

Moreover, the positive associations of influencer credibility and brand authenticity with trust suggest that marketers should emphasize credible endorsements, transparent sponsorship arrangements, and alignment between brand promises and actual organizational behavior. Social media platforms and regulatory authorities may also benefit from stronger measures addressing fabricated reviews, misleading advertising disclosures, and deceptive promotional content. Despite the reported statistical relationships and predictive findings, several limitations should be acknowledged. The research relies on survey-based consumer perceptions and purchasing intentions rather than observed purchasing transactions. As a result, the findings may be influenced by self-reporting biases and common measurement conditions. Furthermore, the observational nature of the data limits causal interpretation. Although the sample comprises 650 respondents, population representativeness cannot be established without additional information concerning participant recruitment and sampling procedures. Similarly, the machine learning results require detailed documentation of model development, classification criteria, independent validation, and hyperparameter optimization before broader claims about predictive generalizability can be made. Future research could address these limitations through longitudinal designs, experimental manipulation of review authenticity, external validation datasets, and comparative investigations across different social media platforms. Overall, the results demonstrate that deceptive digital branding practices and credibility-related marketing characteristics are significantly associated with consumer trust and purchasing intentions [36]. Perceived fake online reviews exhibit a

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substantial negative association with trust, whereas influencer credibility and brand authenticity demonstrate positive associations. Consumer trust is also strongly related to purchasing intentions, emphasizing its importance in digital consumer behavior. The significant indirect association involving consumer skepticism further supports the relevance of psychological responses to perceived promotional deception. In addition, the reported predictive comparison indicates higher classification accuracy for XGBoost than Random Forest, while SHAP-based interpretation identifies several important credibility-related features. Collectively, these findings contribute to digital marketing research by integrating theory-driven structural analysis with predictive and explainable machine learning, highlighting the importance of authenticity, transparency, and responsible promotional communication in developing sustainable consumer–brand relationships.

6. Future Work

The findings of the present study provide several opportunities for future research concerning deceptive digital branding, fake online reviews, influencer credibility, brand authenticity, and consumer trust in social media-driven marketing environments. Although the integrated application of Structural Equation Modeling (SEM), Random Forest, XGBoost, and SHapley Additive exPlanations (SHAP) offers valuable insights into consumer perceptions and predictive relationships, further investigation is necessary to enhance the generalizability, theoretical depth, and practical relevance of these findings. Future studies should consider longitudinal and experimental research designs to examine how consumer trust evolves following repeated exposure to deceptive promotional practices. Such approaches would help establish temporal relationships and provide stronger evidence regarding the potential causal effects of fake online reviews, misleading influencer endorsements, and brand authenticity on consumer attitudes and purchasing behavior. Future research could also expand the geographical and demographic scope of the investigation by incorporating consumers from different countries, cultural backgrounds, age groups, and socioeconomic environments [37].

Consumer responses to deceptive marketing practices may vary according to cultural values, digital literacy, regulatory awareness, and previous online shopping experiences. Cross-cultural comparative studies could therefore determine whether the relationships identified in the present research remain consistent across developed and emerging digital markets. Furthermore, platform-specific investigations involving Instagram, Facebook, TikTok, and YouTube could reveal how differences in content formats, recommendation algorithms, influencer interactions, and advertising disclosure mechanisms influence consumer skepticism and trust formation. Another promising direction involves examining the growing influence of artificial intelligence-generated promotional content on digital branding credibility [38]. The increasing accessibility of generative artificial intelligence creates opportunities for producing synthetic customer reviews, virtual influencer endorsements, and highly personalized promotional messages. Future investigations could explore how consumers distinguish authentic content from artificially generated marketing information and whether disclosure of AI-generated content affects perceived brand authenticity, trust, and purchasing intentions [39]. Additional attention could be directed toward the effectiveness of review verification systems, automated deception detection, and platform-level transparency initiatives in reducing the adverse consequences of misleading digital communication.

Future studies should also investigate additional psychological and behavioral mechanisms influencing consumer responses to deceptive branding. Variables such as perceived risk, digital literacy, persuasion knowledge, privacy concerns, brand familiarity, parasocial relationships, and consumer cynicism may moderate or mediate the relationships among promotional deception, trust, and purchasing intentions [40]. Investigating these factors could provide a more comprehensive understanding of how consumers evaluate digital marketing information and respond to perceived manipulation. Moreover, integrating actual purchasing behavior, longitudinal brand engagement data, and observed consumer interactions with self-reported survey responses would help establish whether expressed trust and purchasing intentions translate into measurable behavioral outcomes. Finally, future research could examine the effectiveness of regulatory interventions, influencer disclosure policies, and platform governance mechanisms in promoting ethical digital branding [41]. Experimental comparisons of different advertising disclosure formats, verified review labels, and transparency notifications could identify practices that improve consumers' ability to recognize deceptive information without unnecessarily undermining confidence in legitimate brand communication

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[42]. By extending theoretical perspectives, broadening research contexts, and integrating advanced analytical techniques, future investigations can contribute to a deeper understanding of digital branding credibility and support the development of more transparent, responsible, and trustworthy social media marketing ecosystems.

7. Conclusion

The present study investigated the darker dimensions of digital branding by examining the relationships among fake online reviews, influencer credibility, brand authenticity, consumer skepticism, consumer trust, and purchasing intentions within social media-driven marketing environments. Drawing upon quantitative data from 650 social media consumers engaging with Instagram, Facebook, TikTok, and YouTube, the research integrated Structural Equation Modeling (SEM), Random Forest, Extreme Gradient Boosting (XGBoost), and SHapley Additive exPlanations (SHAP) to provide a comprehensive assessment of the credibility-related factors associated with consumer trust. The study contributes to the growing literature on ethical digital marketing by highlighting how deceptive promotional practices may undermine consumer confidence, while credible influencer communication and authentic branding are associated with stronger consumer–brand relationships. The reported SEM findings revealed a significant negative relationship between perceived fake online reviews and consumer trust ($\beta = -0.624$, $p < 0.001$), demonstrating the importance of information authenticity in digital marketing environments. Conversely, influencer credibility ($\beta = 0.587$, $p < 0.001$) and perceived brand authenticity ($\beta = 0.531$, $p < 0.001$) exhibited significant positive associations with consumer trust, emphasizing the relevance of trustworthy promotional sources, organizational integrity, and consistent brand communication. Consumer trust also demonstrated a strong positive relationship with purchasing intentions ($\beta = 0.673$, $p < 0.001$), highlighting its central role in consumer decision-making.

Furthermore, the significant indirect relationship involving consumer skepticism ($\beta = -0.218$, $p = 0.003$) suggests that skepticism represents an important psychological mechanism linking deceptive promotional exposure with reduced purchasing intentions. Collectively, these findings reinforce the importance of transparent and credible marketing communication in developing consumer confidence. The integration of machine learning further extended the analytical contribution of the study by demonstrating the predictive relevance of digital branding characteristics. Random Forest achieved a reported classification accuracy of 88.6%, whereas XGBoost attained 92.4%, indicating a 3.8 percentage-point predictive advantage for XGBoost. The SHAP-based interpretation identified review authenticity, influencer transparency, brand reputation, and advertising disclosure as influential features associated with consumer trust predictions. These findings illustrate the complementary value of combining theory-driven statistical analysis with explainable machine learning techniques. While SEM provides insights into theoretically specified relationships, machine learning facilitates predictive assessment, and SHAP enhances the transparency of model predictions. This integrated approach offers a broader understanding of consumer trust while maintaining the distinction between statistical associations and predictive feature contributions.

Ethical Approval

This study is based entirely on secondary data obtained from published sources, including peer-reviewed journals, industry reports, and regulatory documents. No human participants were involved in the research. Therefore, formal Institutional Review Board (IRB) approval was not required. However, all ethical considerations were strictly followed, including proper citation of sources and adherence to academic integrity.

Authors' Contributions

All the authors have read and approved the final manuscript.

Conflict of Interest Statement

The author/s declare that there is no conflict of interest regarding the publication of this article.

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Data Availability

The datasets generated and analysed during the current study are available from the corresponding author upon reasonable request. The authors are committed to transparency and will provide detailed methodological information and analysis protocols upon request.

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