

Designing Culturally Resonant Virtual Influencers: Identifying Customer Requirements Using QFD Approach

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Abstract

Virtual influencers (VIs) are increasingly being adopted in digital marketing and social media advertising. However, limited research has examined how VIs should be designed to align with consumer preferences in culturally diverse markets such as India. This study employs an adapted Quality Function Deployment (QFD) approach to identify and prioritize design attributes that enhance the acceptance and effectiveness of VIs among Indian consumers. Drawing on theories of source credibility and source attractiveness, six design characteristics were identified and mapped against consumer requirements. The findings reveal that similarity to humans or culture emerged as the most influential design attribute, exhibiting strong positive relationships with attractiveness, likability, and hedonic value. Narration technique positively influenced endorsement relevance but was negatively associated with likability, suggesting a trade-off between informational and emotional appeal. The study contributes to the emerging literature on virtual influencers by introducing QFD as a systematic framework for translating consumer preferences into actionable design specifications. The findings provide practical guidance for marketers and developers seeking to create culturally resonant and credible virtual influencers for the Indian market.

Keywords

Virtual influencers, Quality Function Deployment, Source credibility, Virtual Influencer Design, Consumer perception.

1. Introduction

In today's digital age, opinion leaders have become social media influencers, transforming the way companies promote their brands (Ibáñez-Sánchez et al. 2022) and express their mission and values to consumers (Yang et al. 2021). Social media influencers (SMIs) are users who have attained a celebrity-like status, developed engaging content based on their expertise, and secured a considerable network of followers whose behavior they influence (De Veirman et al. 2017; Ge and Gretzel 2018). With continuous advancements in technologies such as AI, computer graphics, and natural language processing, Virtual Influencers (VIs) are the new face of the influencer marketing landscape (Sands et al. 2022), and companies have begun incorporating VIs into their social media marketing strategies (Kim et al. 2023). VIs are anthropomorphic, computer-generated personas designed to mimic human-like traits and behaviors (Moustakas et al. 2020; Arsenyan and Mirowska 2021). Akin to human influencers, they can be effective due to their visual and behavioral resemblance to real individuals (Sands et al. 2022).

Since the emergence of Lil Miquela in 2016, the popularity of virtual influencers has grown substantially, with more than 200 VIs currently active on Instagram (Qu and Baek 2024). Reflecting this trend, India's first VI, Kyra, was launched in 2022 and quickly amassed over 200,000 followers on Instagram, indicating a positive reception of the VI phenomenon among Indian

users. Consequently, understanding consumer expectations toward VIs in India has become increasingly important for brands seeking to localize digital marketing strategies.

Despite the growing global popularity of VIs, academic research has largely concentrated on consumer perceptions in Western markets, overlooking culturally distinct and rapidly expanding digital landscapes such as India. With over 326 million social media users, India is one of the largest and most active online populations globally, making it a crucial context for understanding emerging trends in influencer marketing. However, VIs are still a relatively novel concept in India, and limited research exists on how Indian consumers perceive these computer-generated personas as credible and engaging endorsers. Given that cultural norms, values, and media consumption patterns influence how audiences respond to influencer cues, it is essential to explore how VIs are interpreted in non-Western settings, particularly in India. By investigating Indian consumers' perception and responses to VIs, this study aims to address a critical gap in the literature, contribute to global discussions on digital marketing effectiveness, and offer strategic insights for brands seeking to localize VI-based campaigns in culturally diverse markets like India. This gap motivates the present study to address the following research questions:

- RQ1: What customer requirements influence Indian consumers' perceptions and acceptance of virtual influencers?
- RQ2: How can consumer requirements be translated into prioritized virtual influencer design characteristics using QFD?

1.1 Objectives

Despite the increasing adoption of VIs in marketing communication, existing studies have largely focused on consumers' perceptions, trust formation, and engagement outcomes. Limited research has examined how consumer insights can be systematically translated into actionable design guidelines for developing culturally resonant VIs, particularly in emerging markets such as India. Thus, the objective of the present study is to design culturally resonant virtual influencers for the Indian market by translating consumer requirements into prioritized design characteristics through QFD.

2. Literature Review

2.1 Virtual influencers

Broadly, virtual assistants and VI are subsets of virtual humans, distinguished by their area-specific functions. While virtual assistants are primarily utilized in customer support services (Franke et al. 2023), VI are employed in endorsement marketing for communication purposes. This study is confined to exploring the use of VI as endorsers in marketing communication.

VI, interchangeably referred to virtual celebrities, digital personalities, computer-generated imagery (CGI) influencers (Mrad et al. 2022, Mouritzen et al., 2024), and artificial intelligence (AI) influencers, are computer-generated fictional personas that exhibit human-like characteristics (Miao et al. 2022). These are digital characters crafted with distinct physical features and personalities (Moustakas et al. 2020) that engage and influence social media users through their online activities (Hudders et al. 2021).

Yan et al. (2024) state that VIs have been categorized based on the *purpose of creation* and *visual characteristics*; the former pertains to whether influencers being representative of specific brands, and are classified into two typologies, namely, *incarnate avatars* and *innate influential avatars* (Choudhry et al. 2022); the latter pertains to the level of anthropomorphism and the reality of the appearance, further classifying them as *mimic-real human VI*, *animated human VI*, and *non-human VI* (Choudhry et al. 2022; Yang et al. 2022; Mouritzen et al. 2024).

Perceived anthropomorphism is the degree to which a stimulus possesses human properties in terms of appearance and behavior (Kim et al. 2023). VI exhibit appearance and behavioral anthropomorphism, and their visual representations can range from anime-like stylizations to nearly human-like depictions (Kim et al. 2023). Behavioral realism refers to the extent to which their actions mimic those of actual humans (Nowak and Fox 2018). Anthropomorphism enhances the perceived competence and persuasiveness of digital characters (Go and Sundar 2019). Research indicates that individuals are more inclined to engage with human-like cues and tend to view anthropomorphic characters as more credible (Miao et al. 2022). Moreover, Sands et al. (2022) suggest that VI can be as effective as human influencers, given their ability to both look and behave like humans. Drawing on source credibility and source attractiveness theories, the present study explores the design attributes that shape consumers' acceptance of virtual influencers. The study then translates identified customer requirements into actionable design characteristics.

2.2 VI in the Indian context

Research on VIs has primarily examined consumer responses to these AI-enabled endorsers, with studies demonstrating that attributes such as credibility, attractiveness, homophily, and parasocial interaction significantly influence engagement and behavioral intentions (Kumar and Shankar 2024; Rehman et al. 2025). Emerging evidence from the Indian context further suggests that consumers perceive VIs as novel yet potentially influential marketing agents, capable of shaping decision-making processes (Angmo and Mahajan 2024). A second stream of research has emphasized the role of anthropomorphism, authenticity, and cultural similarity in enhancing trust and social presence (Rehman et al. 2026). Human-like appearances, authentic interactions, and culturally relevant cues have been shown to increase consumers' trust and engagement with VIs (Goel and Garg 2025; Rehman et al. 2025). (Table 1)

Table 1. Summary of Existing Virtual Influencer (VI) Findings in the Indian Context

Study	Theoretical lens	Focus of the Study	Key Findings in the Indian Context	Research Gap
Angmo and Mahajan (2024)	Grounded Theory	Consumer perceptions of VIs among Millennials and Gen Z	Identifies psychological aspects, challenges, and perceived potential of VIs in consumer decision-making	Does not translate consumer perceptions into concrete guidance for VI creation or customization
Goel and Garg (2025)	NA	Anthropomorphism, authenticity, and trust in VIs	Demonstrates that anthropomorphic cues and authenticity build trust and drive engagement	Tests predefined cues; lacks consumer-led prioritization of VI attributes
Rehman et al. (2025)	CASA; Source Attractiveness	India	Credibility, PSI, attractiveness, behavioral intention	Language and cultural similarity cues shaping trust
Kumar and Shankar (2024)	Source Attractiveness Theory	Attributes of metaverse influencers	Identifies attractiveness, credibility, homophily, and intimacy as key drivers of engagement and social glue	Attribute-centric validation overlooks consumer meaning-making and design translation
Jhawar et al. (2024)	Source Credibility	Conceptual discussion of VIs	Describes the emergence of VIs and a paradigm shift in influencer marketing	Lacks empirical consumer evidence and actionable design implications
Current Study	Source credibility & Source attractiveness Theory	—	Prior studies establish that credibility, authenticity, anthropomorphism, and relational cues influence consumer responses to VIs	Limited integration of consumer interpretations into systematic VI creation and customization for Indian audiences

Despite these advances, existing studies on virtual influencers have largely remained outcome-oriented, focusing on the effects of specific attributes on consumer engagement, trust, and behavioral intentions. While prior research highlights the importance of credibility, authenticity, anthropomorphism, and cultural similarity in shaping consumer responses, limited attention has been devoted to translating these consumer interpretations into actionable design specifications for creating virtual influencers. This limitation is particularly evident in emerging markets such as India, where cultural values and social norms may influence perceptions of attractiveness, trustworthiness, and authenticity differently from Western contexts. Consequently, there remains a need for a systematic, consumer-driven framework that integrates user expectations into the design and customization of virtual influencers. Addressing this gap, the present study employs Quality Function Deployment (QFD) to transform consumer requirements into prioritized design characteristics, thereby providing evidence-based guidance for developing culturally resonant virtual influencers for Indian audiences.

3. Methods

This study adopted an adapted QFD approach to translate consumer requirements into technical design characteristics for virtual influencers. QFD is a customer-driven design methodology that converts the Voice of Customers into product specifications. The House of Quality (HOQ) framework was employed to systematically prioritize design attributes relevant to virtual influencers.

The QFD process involved identifying customer requirements (“Whats”), deriving design characteristics (“How”), establishing relationships between them, and computing weighted priorities. Six design characteristics were derived from literature on source credibility and source attractiveness: (1) similarity to humans or culture, (2) narration technique, (3) endorsement relevance, (4) hedonic value, (5) likability, and (6) attractiveness.

3.1 Participants

Participants were screened using two objective criteria: (1) active daily engagement with social media platforms, and (2) following at least one Indian or foreign virtual influencer. These criteria ensured that respondents possessed adequate familiarity with virtual influencer content and interactions. A purposive sampling technique was thus adopted to meet selection criteria. To ensure gender balance and capture diverse consumer perspectives, the final sample comprised 30 participants, including 15 males and 15 females, who participated in the preliminary interview and then QFD exercises.

3.2 Customer requirements and design characteristics

The customer requirements are akin to the expectations of Indian social media users from the virtual influencers. Needless to state that it is important to identify social media users’ requirements in order to satisfy them. The design characteristics refer to the elements that make up a product or system, and in this context, they refer to the VI. If a VI creator implements these attributes in the design of a VI, the perceived trust and attractiveness of a VI as a customer requirement can be increased.

The consumer requirements were extracted and identified during the preliminary interviews (e.g., human-like appearance, color diversity, voice on environmental issues). Design characteristics were identified through a structured, theory-driven screening process aligned with QFD principles of translating customer expectations into actionable design elements. Methodology and guidelines followed by Sahney et al. (2004) and Shahin and Nikneshan (2008) were adapted for the study.

Step-wise process followed to select Design Characteristics (HOWs) for VIs

Step 1: Defining the Design Domain

The study adopted an exploratory and theory-driven approach, consistent with prior QFD applications in product and service design. The scope of the analysis was confined to virtual influencer design within the context of social media advertising. The design domain was established based on insights from source credibility and source attractiveness theories, as well as existing literature on virtual influencers (Table 2).

Step 2: Identification of Potential VI Design Characteristics

An initial pool of virtual influencer design characteristics was compiled through an extensive review of the literature. These characteristics encompassed visual, narrative, and endorsement-related cues that have been shown to influence consumer perceptions and expectations of VIs.

Step 3: Screening Using Benchmarking Criteria

Each identified design characteristic was systematically evaluated using predefined inclusion and exclusion criteria. The screening process considered theoretical relevance, perceptibility to consumers, design controllability, and conceptual distinctiveness to ensure the selection of meaningful and non-redundant attributes (Table 3).

Step 4: Functional Fit Assessment (WHAT–HOW Alignment)

The shortlisted design characteristics were assessed for their ability to address the identified customer requirements. Only those characteristics demonstrating a clear functional relationship with at least one customer requirement were retained for further analysis.

Step 5: Parsimony and Final Selection

To enhance conceptual clarity and avoid redundancy, overlapping or outcome-oriented constructs were removed. This process yielded a parsimonious set of design characteristics suitable for inclusion in the House of Quality (HOQ).

Step 6: Finalization of Design Characteristics

The final output consisted of six theory-grounded design characteristics (HOWs) for QFD analysis: similarity to humans or culture, narration technique, endorsement relevance, hedonic value, likability, and attractiveness.

Table 2. Inclusion–Exclusion Criteria Table for VI Design Characteristics

Criterion	Inclusion Rule	Exclusion Rule
<i>Design Scope</i>	Visual, narrative, or endorsement cues	Platform mechanics, algorithms
<i>Control</i>	Can be designed or manipulated	Emergent or system-driven
<i>Perceptibility</i>	Directly perceived by viewers	Latent or backend processes
<i>Theoretical Fit</i>	Mapped to credibility/attractiveness	No clear theory linkage
<i>Literature Support</i>	Repeatedly discussed empirically	Anecdotal or technical
<i>Functional Fit (WHAT–HOW)</i>	Satisfies ≥ 1 customer expectation	No clear consumer benefit
<i>Conceptual Distinctness</i>	Unique persuasion mechanism	High overlap with other HOWs
<i>Outcome Separation</i>	Design input (cause)	Attitudes, engagement, purchase

Table 3. Benchmarking criteria used to fix design characteristics

Benchmarking Criteria	Key studies
<i>Theoretical anchoring</i>	Shahin and Nikneshan (2008)
<i>Literature support</i>	Sahney et al., 2006; Shahin and Nikneshan (2008)
<i>Design controllability</i>	Sahney et al., 2006
<i>Functional relevance</i>	Sahney et al., 2006
<i>Non-Redundancy</i>	Shahin and Nikneshan(2008)
<i>QFD compatibility</i>	Sahney et al., 2006; Shahin and Nikneshan (2008)

3.3 Procedure

For the present study, the traditional Quality Function Deployment (QFD) technique was adapted to suit the context of virtual influencer design. The adapted framework comprised seven sequential steps for translating consumer requirements into prioritized design characteristics.

Step 1: Identification of Customer Requirements (WHATs)- Ten customer requirements were identified through qualitative interviews with consumers. These requirements represented the expectations and preferences of Indian social media users toward virtual influencers (Table 4).

Step 2: Identification of Design Characteristics (HOWs)- Drawing on source credibility and source attractiveness theories, six design characteristics were identified from the literature: (1) similarity to humans or culture, (2) narration technique, (3) endorsement relevance, (4) hedonic value, (5) likability, and (6) attractiveness.

Step 3: Importance Rating of Customer Requirements- Participants evaluated the importance of each customer requirement using a five-point Likert scale ranging from 1 (least important) to 5 (most important).

Step 4: Development of the Relationship Matrix- A relationship matrix was constructed to examine the extent to which each design characteristic addressed individual customer requirements. Relationships were rated as weak (1), moderate (3), or strong (9), while the absence of a relationship was assigned a score of zero.

Step 5: Computation of Weighted Scores- Weighted scores for each design characteristic were calculated by combining customer importance ratings with the corresponding relationship scores.

Step 6: Prioritization of Design Characteristics- Absolute and relative weights were computed for each design characteristic to determine their relative importance in virtual influencer design.

Step 7: Construction of the Roof Matrix- Interrelationships among design characteristics were assessed through correlation analysis in Excel and represented in the roof of the House of Quality (HOQ). Correlations were categorized as positive ($\alpha = 0.3$ to 0.49), strong positive ($\alpha = 0.5$ to 0.9), negative ($\alpha = -0.3$ to -0.49), and strong negative ($\alpha = -0.5$ to -0.9). The identified relationships A-D, A-E, A-F, B-C, B-E, C-E, D-E, and D-F were denoted using the symbols (+, ++, −, and —) in the HOQ roof matrix.

4. Data Collection

The study employed a two-stage data collection process. In the preliminary stage, semi-structured interviews were conducted with 30 participants to explore their perceptions of and expectations from virtual influencers (VIs). A purposive sampling technique was used to reach the target sample. Instagram users aged 21–35 years who were familiar with virtual influencer content and represented the target demographic of social media consumers. This age group was selected because young adults constitute the primary users and consumers of influencer content on social media platforms. The interview findings generated ten customer requirements reflecting the attributes that Indian consumers value in VIs.

In the second stage, the same participants were re-contacted and invited to participate in a structured Quality Function Deployment (QFD) exercise. Prior to participation, informed consent was obtained from all respondents. Participants were selected based on two criteria: (1) active daily engagement with social media platforms, and (2) following at least one Indian or foreign virtual influencer. All participants satisfied these criteria and possessed prior exposure to VI content, making them suitable for evaluating customer requirements and design characteristics. The final sample comprised 30 respondents, including 15 males and 15 females, ensuring balanced representation.

Participants rated the importance of each customer requirement on a five-point Likert scale ranging from 1 (least important) to 5 (most important). The relationships between customer requirements (WHATs) and design characteristics (HOWs) were assessed using standard QFD scores of 9 (strong), 3 (moderate), 1 (weak), and 0 (no relationship). Weighted scores and rankings were subsequently computed to prioritize VI design characteristics, while correlation analysis was conducted to construct the roof of the House of Quality matrix.

5. Results and Discussion

The findings identified ten customer requirements and six design characteristics relevant to virtual influencer design. The ranking of design characteristics revealed that similarity to humans or culture was the most influential attribute in shaping consumer perceptions of virtual influencers.

Correlation analysis indicated strong positive relationships between similarity to humans or culture and hedonic value, likability, and attractiveness. These findings suggest that virtual influencers exhibiting culturally familiar and human-like traits are perceived as more engaging, attractive, and enjoyable. Furthermore, the narration technique demonstrated a strong positive relationship with endorsement relevance, indicating that coherent storytelling enhances perceived authenticity and product fit.

Conversely, narration technique exhibited a negative association with likability, suggesting that highly structured or overly promotional narratives may reduce emotional appeal. The results highlight that consumer engagement with virtual influencers is shaped by both rational evaluations, such as endorsement relevance, and affective responses, including attractiveness and likability. Overall, the findings demonstrate that culturally grounded anthropomorphic design plays a central role in enhancing the acceptance and effectiveness of virtual influencers in the Indian context. The application of QFD further illustrates its usefulness as a systematic decision-making tool for developing AI-driven endorsers aligned with consumer expectations.

Table 4. Code and items for analysis

Codes		Items	
A	Similarity of VI	1	Human-like appearance
B	Narration Technique	2	Color diversity
C	Endorsement	3	Natural body representation
D	Hedonism	4	Indian Attires
E	Likability	5	Festivals' Cues
F	Attractiveness	6	Product-influencer fit
		7	Informative
		8	Entertaining
		9	Voice on socially responsible behavior
		10	Voice on environmentally conscious behavior

6. Conclusion

Virtual influencers are increasingly transforming digital marketing and social media communication. However, limited research has examined how these digital personas should be designed to align with consumer expectations in culturally diverse markets. Addressing this gap, the present study employed an adapted QFD approach to translate Indian consumers' requirements into actionable VI design characteristics. The findings revealed that similarity to humans or culture emerged as the most influential design characteristic, exhibiting strong positive relationships with attractiveness, likability, and hedonic value. Narration technique was found to positively influence endorsement relevance while negatively affecting likability, suggesting a trade-off between informational effectiveness and emotional appeal.

The study contributes to the growing literature on virtual influencers in three important ways. First, it extends existing research beyond consumer outcomes toward the design and development of virtual influencers. Second, it provides empirical insights from the Indian context, a rapidly expanding but underexplored digital market. Third, it demonstrates the usefulness of QFD as a systematic framework for converting consumer expectations into design specifications for AI-enabled endorsers. From a managerial perspective, the findings suggest that brands and developers should prioritize culturally familiar, human-like, and authentic virtual influencer characteristics when targeting Indian audiences. Designers should also carefully balance narrative richness with emotional relatability to maximize consumer acceptance.

Like all studies, this research has limitations. The findings are based on a relatively small sample and focus exclusively on Indian consumers. Future studies may validate the proposed framework by using larger samples, conducting cross-cultural comparisons, and employing experimental designs that examine different categories of virtual influencers.

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