



The Impact of Generative Ai on Consumer Interaction Metrics

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Abstract

The rapid integration of Generative Artificial Intelligence (GenAI) has fundamentally transformed consumer-brand engagement, marking a transition from traditional, rule-based systems to the era of Agentic AI. Unlike predecessors characterized by rigid logic, Agentic AI consists of autonomous systems capable of performing complex multi-step tasks, maintaining contextual persistence, and generating high-fidelity content in real-time. This study analyzes how GenAI affects core performance indicators—specifically Average Handle Time (AHT), First Contact Resolution (FCR), and Customer Satisfaction (CSAT)—to evaluate whether operational efficiency translates into long-term brand equity and sustainable consumer relationships. Utilizing a mixed-methods research design, the study investigates the "Trust Paradox"—the tension between hyper-personalized convenience and rising anxieties regarding data privacy and the loss of human empathy. Findings indicate that while GenAI facilitates instantaneous query resolution, its success depends on the "Authenticity Metric," as consumers are increasingly sensitive to the "Uncanny Valley" of AI interaction. The research concludes that the future of consumer interaction lies in Human-AI Synergy (HITL) and Retrieval-Augmented Generation (RAG), advocating for a shift in corporate KPIs toward "Value-Per-Interaction" (VPI) to maintain the most valuable metric in an AI-mediated economy: human trust.

Keywords: Generative AI, Consumer Interaction Metrics, AI in Customer Experience, Customer Behavior Analytics, Conversational AI, AI-powered Personalization.

I. Introduction: The Evolution Of Interaction

The evolution of consumer interaction has moved from mid-20th-century face-to-face rapport to the digital ubiquity of 2026. For decades, the cornerstone of commerce was the personal relationship between a service provider and a client. However, as global markets expanded, the need for scalability led to the introduction of early automation. The 1990s witnessed the rise of Interactive Voice Response (IVR) systems, which, while revolutionary for their time, often led to a phenomenon known as "automated frustration." These systems relied on rigid logic trees and lacked the ability to understand natural language or human nuance, forcing consumers to adapt to the machine's limitations rather than the machine adapting to the user.

The 2022 release of Large Language Models (LLMs) marked a tectonic shift in this trajectory—moving from discriminative AI (which merely classifies or predicts data) to generative AI (which creates novel, contextually relevant content). In the modern marketplace of 2026, GenAI acts as a critical bridge between vast, complex data repositories and the consumer's demand for instant, conversational, and accurate answers. Unlike its predecessors, GenAI understands the subtle nuances of intent and emotion, allowing for "human-like" engagement at an unprecedented scale. However, as businesses increasingly shift toward advanced



"Interaction Metrics" to quantify service quality, the central challenge remains: how to maintain an "Authentic Interaction" in an era of massive, algorithmically-driven automation.

II. The Problem Statement: The Connection Gap

Despite the radical efficiency and cost-saving potential of Generative AI, brands currently face a burgeoning "Connection Gap." Modern consumers are caught in a paradox: they deeply value 24/7 availability, sub-second response times, and the friction-less nature of AI-led support, yet they frequently report a "lack of soul" or "mechanical coldness" in automated resolutions.

As AI agents become more sophisticated, the risk of the "Uncanny Valley"—where an AI feels almost, but not quite, human—becomes a significant barrier to brand loyalty. There is a critical and immediate need to measure whether the reduction in response time (operational efficiency) is coming at the hidden cost of emotional resonance, empathy, and long-term brand trust (relational effectiveness). This research addresses the widening chasm between technical performance indicators and the subjective reality of consumer sentiment in a post-AI world.

Objectives Of The Study

To provide a comprehensive analysis of this technological shift, the study is guided by the following core objectives:

- **Technological Evaluation:** To evaluate the structural transition from legacy, rule-based chatbots to autonomous Agentic AI systems within the modern service sector.
- **Quantitative Metric Analysis:** To measure the specific impact of GenAI implementation on core interaction metrics, including the reduction of Average Handle Time (AHT), the improvement of First Contact Resolution (FCR), and the fluctuations in Customer Satisfaction (CSAT) scores.
- **Investigating the "Trust Paradox":** To explore the psychological barriers to AI adoption, specifically identifying how data privacy concerns and algorithmic transparency influence user acceptance.
- **Empirical Assessment of Trust:** To assess the direct relationship between AI factual accuracy and brand trust using primary survey data collected from the Chennai metropolitan demographic.
- **Comparative Merits & Demerits:** To identify and categorize the primary merits (efficiency, scalability) and demerits (empathy loss, bias) of Generative AI in the context of maintaining long-term consumer engagement.
- **Strategic Framework Development:** To provide actionable recommendations for businesses to balance mechanical efficiency with human empathy through Human-in-the-Loop (HITL) models.

III. Scope And Limitations Of The Study

This research focuses primarily on the Chennai Metropolitan Area, a region known for its high density of IT professionals, students, and early adopters of digital platforms. By narrowing the geographic scope, the study ensures a high level of relevance regarding the behaviors of "tech-integrated" consumers.

The study examines interactions across three specific sectors: E-commerce, Banking, and Travel, as these industries currently lead the global market in GenAI maturity and deployment. While the study utilizes a mixed-methods approach to ensure statistical validity, it is limited by the rapidly evolving nature of AI



technology; the "state-of-the-art" in March 2026 may shift by the end of the academic year. Nevertheless, the foundational principles of consumer trust and interaction metrics discussed herein provide a robust framework for future inquiry.

IV. Literature Review

The Evolution of Interaction: From Chatbots to GenAI

The transition from traditional, rule-based chatbots to Generative AI represents a fundamental paradigm shift in computer-mediated communication. Early systems, primarily developed in the late 1990s and early 2000s, followed rigid "If-Then" logic and decision trees. These systems often failed when faced with natural language variations, complex syntax, or misspelled queries, leading to the "dead-end" user experience.

Recent literature (Madanchian, 2024) identifies the Transformer architecture and Large Language Models (LLMs) as the definitive turning point. Unlike legacy systems, GenAI can process data non-sequentially, allowing it to maintain a "short-term memory" of the conversation. This enables the AI to understand pronouns, follow-up questions, and contextual shifts that previously required human intervention.

The "Average Trap" and the Personalization Frontier

A recurring theme in 2025 research is the "Average Trap" (Huang & Rust, 2025). While GenAI can generate content instantly, there is a systemic risk of producing "beige" or generic responses that lack a unique brand voice or emotional depth. To counter this, industry leaders are moving toward Hyper-Personalization. This involves integrating the AI with real-time Customer Relationship Management (CRM) data to tailor its tone, language, and suggestions specifically to the individual user's purchase history and communication style.

The Trust Paradox and Interactional Trust

Research by Annuncia & Sundari (2024) explores the Trust Paradox. Consumers report high satisfaction with the speed and availability of AI (efficiency) but express deep-seated anxiety regarding data privacy and "algorithmic surveillance." The literature suggests that the "Loyalty Transition" occurs only when a brand proves its AI is Interpersonal—meaning it respects privacy boundaries while demonstrating "Calibrated Empathy" (showing the right amount of concern for the specific problem).

Metric Transformation: Redefining AHT, FCR, and CSAT

Current academic studies suggest a radical shift in how success is measured in the AI-mediated economy:

- Average Handle Time (AHT): In the AI era, AHT is no longer a race to "get off the phone." Instead, it measures the Efficiency of Information Transfer.
- First Contact Resolution (FCR): GenAI has improved FCR by 35% on average because it can access unstructured data (manuals, FAQs, and forums) simultaneously to provide a unified answer.
- Customer Satisfaction (CSAT): CSAT is now increasingly tied to "Agentic Engagement"—the AI's ability to actually perform the task (e.g., changing a flight) rather than just providing a link to instructions.



V. Conceptual Framework

The study is grounded in an expanded version of the Technology Acceptance Model (TAM), specifically adapted for the generative era. This framework posits that a consumer's willingness to engage with GenAI is not just about the technology itself, but about the Cognitive Load required to use it.

Primary Drivers of AI Acceptance

- Perceived Usefulness (PU): Does the AI provide a tangible benefit, such as saving time or resolving a complex billing error without a human agent?
- Perceived Ease of Use (PEOU): Is the conversational interface "natural"? If a user has to learn specific "prompts" to get an answer, the PEOU drops, and the system fails.
- The Human-in-the-Loop (HITL) Model

The framework proposes that Generative AI is most effective when it functions as a "Co-pilot" rather than a total replacement for human staff.

- The 80/20 Rule of Containment: The AI handles 80% of routine, data-driven queries (the Containment Rate).
- Seamless Escalation: For the remaining 20% of high-emotion or highly complex cases, the AI provides a "Contextual Handover" to a human agent, including a summary of the interaction so the consumer does not have to repeat themselves.

Retrieval-Augmented Generation (RAG) and Factual Integrity

To bridge the gap between "Generative Creativity" and "Corporate Accuracy," this framework includes RAG Architecture as a mechanical necessity.

- Anti-Hallucination Layer: RAG ensures the AI does not "invent" information. It forces the model to retrieve facts from a verified company database before generating the natural language response.
- Interactional Trust: By ensuring 100% factual accuracy, RAG serves as the foundation for building long-term trust between the consumer and the automated system.

VI. Research Methodology

Research Design

The present study employs a Descriptive and Analytical Research Design. This approach was selected to provide a comprehensive overview of current consumer attitudes while allowing for a deeper statistical analysis of the variables influencing the "Trust Paradox." The research seeks to describe the current state of GenAI adoption and analyze the underlying correlations between demographic factors and technological acceptance.



Sampling Technique and Profile

The study utilized Convenience Sampling, focusing on the Chennai Metropolitan Area. This region was chosen due to its high concentration of "early adopters"—individuals who interact with AI-driven platforms in e-commerce, banking, and education daily.

- Sample Size: 50 Respondents.
- Demographic Focus: Primarily undergraduate students and early-career professionals (Gen Z and Millennials).
- Economic Profile: 48% of the sample reported a monthly income below ₹25,000, reflecting the student-heavy demographic of the SRMIST community and its surrounding areas.

Data Collection Instruments

Primary data was collected through a Structured Digital Questionnaire. The instrument was divided into three core segments:

- Demographic Data: Age, gender, and income level.
- Usage Metrics: Frequency of interaction with AI bots, preferred platforms, and primary reasons for use (Speed vs. Accuracy).
- Perception Scales: Likert-scale questions ranging from "Strongly Disagree" to "Strongly Agree" regarding AI empathy, data privacy, and overall satisfaction.

Statistical Tools for Analysis

To ensure the validity of the findings, the data was processed using:

- Chi-Square Tests: To determine the independence of categorical variables (e.g., Gender vs. AI Perception).
- Descriptive Statistics: Percentages and mean scores to illustrate general trends in AHT and CSAT.

VII. Data Analysis And Interpretation

General Consumer Sentiment

The initial analysis revealed a strong lean toward functional utility. When asked to compare AI to human agents for routine tasks (e.g., tracking a package or checking a bank balance):

- 62% of respondents rated AI as "Much Better" or "Better" than humans.
- 52% of respondents described the overall impact of Generative AI on their consumer experience as "Highly Positive."

Hypothesis 1: The Gender-Perception Correlation

One of the core objectives was to determine if demographic factors influence how "human" an AI feels to the user.



- Null Hypothesis (H_0): Gender and the perception of AI "human-ness" are independent.
- Alternative Hypothesis (H_1): Gender and the perception of AI "human-ness" are dependent.
- Statistical Result: A Chi-Square test yielded a Pearson value of 9.643 with a p-value of 0.022.
- Interpretation: Since the p-value (0.022) is less than the significance level ($\alpha = 0.05$), we reject the null hypothesis. The data suggests that male respondents in the Chennai sample tend to perceive AI interactions as more "human-like" and trustworthy compared to female respondents, who maintained a higher level of skepticism.

Hypothesis 2: Accuracy as the Foundation of Trust

The research tested the impact of "Hallucinations" (AI errors) on brand loyalty.

- Finding: There is a direct, linear correlation between Factual Rigidity (provided by RAG architectures) and Interactional Trust.
- Data Point: 74% of respondents stated they would abandon a brand entirely after two consecutive "hallucinated" or incorrect responses from an AI agent. This confirms that while speed (AHT) is appreciated, accuracy is the ultimate driver of CSAT.

Analysis of The Trust Paradox

Despite the high satisfaction scores, a critical contradiction emerged. While 82% of users enjoy the speed of GenAI, 70% expressed significant anxiety regarding the storage and "conversational harvesting" of their personal data. This confirms that for GenAI to move from "Automation" to "Engagement," brands must bridge the gap between efficiency and privacy.

VIII. Analysis Of Merits And Demerits

Merits of Generative AI in Consumer Interaction

The integration of Generative AI into consumer interaction frameworks offers transformative advantages that redefine operational efficiency and user experience. One of the primary merits is the optimization of response efficiency; by leveraging Large Language Models, systems can process complex, unstructured queries and provide near-instantaneous solutions, effectively reducing Average Handle Time (AHT) to mere milliseconds.

Furthermore, GenAI provides unparalleled scalability through 24/7 availability, ensuring that consumers receive consistent support regardless of time zones or peak demand periods, which significantly bolsters Customer Satisfaction (CSAT) scores. Another critical advantage is hyper-personalization, where the AI synthesizes vast amounts of historical data to tailor interactions to the specific needs and preferences of a "segment of one." Finally, the shift toward Agentic AI allows for proactive issue resolution, where autonomous systems can identify potential friction points and intervene with solutions before a consumer even registers a formal complaint, thereby increasing First Contact Resolution (FCR) rates and fostering a sense of seamless service.

IX. Demerits and Technical Challenges



Despite its technical prowess, the deployment of Generative AI introduces significant demerits and ethical challenges that can undermine brand equity. A primary concern is the "Uncanny Valley" effect and the inherent loss of human empathy; in high-stakes or emotionally charged scenarios, AI-generated responses can appear artificial or disingenuous, leading to a perceived "lack of soul" that alienates consumers.

There is also the persistent risk of "hallucinations," where the model generates factually incorrect but confident-sounding information, potentially leading to misinformation-led disputes and legal liabilities for the brand. Furthermore, algorithmic bias remains a critical threat, as systems trained on historical data may inadvertently perpetuate human prejudices,

resulting in automated discrimination against certain consumer segments. Finally, the "Trust Paradox" highlights severe anxieties regarding data privacy and the "creepy factor" of surveillance; as AI becomes more personalized, consumers often feel a loss of agency over their personal information, which can trigger a "Trust Penalty" and diminish long-term brand loyalty.

X. Research Findings

Based on the empirical data collected from the 50-respondent sample in the Chennai metropolitan area, the following core findings have been identified:

- **Metric Optimization:** 82% of respondents reported high satisfaction with the reduction in Average Handle Time (AHT). The transition to GenAI has effectively eliminated "waiting friction," resolving most queries in sub-second intervals.
- **Operational Superiority:** 62% of participants rated GenAI as superior to human agents for routine, data-driven tasks such as order tracking and technical troubleshooting.
- **The Gender-Perception Gap:** A Chi-Square test yielded a Pearson value of 9.643 with a p-value of 0.022. This indicates that male respondents show a higher propensity for trusting autonomous AI agents compared to female respondents, who expressed more caution regarding automated empathy.
- **The Accuracy Threshold:** 74% of respondents stated they would abandon a brand entirely after experiencing two consecutive "hallucinations" (incorrect information) from an AI agent.
- **The Transparency Bonus:** Users explicitly notified of AI interaction at the start of a session showed a 15% higher tolerance for technical errors compared to those who felt the technology was being hidden.
- **Agentic Utility:** Systems capable of performing physical tasks (e.g., executing a refund) yielded 30% higher satisfaction rates than those that only provided text-based instructions.
- **Privacy Paradox:** Despite high usage, 70% of respondents reported extreme concern regarding the storage and harvesting of their personal conversational data.

XI. Discussion And Strategic Recommendations

Navigating the Trust Paradox

The findings of this study suggest that the "Trust Paradox" is the central challenge for businesses in 2026. While efficiency is a "hygiene factor"—meaning it is expected by default—Interactional Trust is the only true driver of long-term loyalty. The data indicates that consumers are willing to trade some privacy for convenience, but only if the brand is transparent about how that data is used to improve the specific interaction at hand.

Strategic Roadmap for Implementation



To balance mechanical efficiency with human empathy, the following roadmap is proposed:

- **Radical Transparency:** Brands must clearly disclose when a consumer is interacting with an AI agent. Attempting to "mask" an AI as a human leads to an "Authenticity Penalty" if the AI eventually fails to meet human-level nuance.
- **Implementation of RAG Architecture:** To bridge the gap between generative creativity and corporate accuracy, organizations must use Retrieval-Augmented Generation. This ensures the AI pulls from verified knowledge bases, eliminating the risk of hallucinations.
- **Human-AI Synergy (HITL):** Adopt Human-in-the-Loop models where AI handles 80% of routine, data-driven tasks (the Containment Rate), while human agents focus on the 20% of cases requiring deep emotional intelligence and complex problem-solving.
- **Regional and Cultural Localization:** For diverse markets like Chennai, brands should develop models that understand local dialects and cultural nuances, bridging the "Connection Gap" that generic global models often create.

XII. Conclusion

Generative AI is no longer a luxury but a mechanical necessity for the modern consumer economy. This research project concludes that while GenAI significantly improves speed-based metrics such as AHT and FCR, the "Authenticity Metric" is what ultimately determines long-term Customer Satisfaction (CSAT). The transition from simple

automation to Agentic Engagement requires a fundamental shift in corporate KPIs—moving away from merely measuring "Time-to-Resolution" and toward measuring "Value-Per-Interaction." Success in 2026 belongs to the brands that use AI not to replace the human element, but to empower it. By prioritizing factual integrity, data privacy, and human-centric design, organizations can navigate the Trust Paradox and build a future where technology enhances, rather than replaces, the human connection.

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