

Effectiveness of Collaborative Models and Governance Mechanisms Between AI and Human in Supply Chain Management – A Study with Reference to Shri Renuka Industries

¹Jeeva G

¹Postgraduate Student

¹Department of Management Studies, DOMS DSCE

¹Dayanand Sagar College of Engineering, Bengaluru, India

Abstract - Digital platforms have become central to how brands sustain relationships with consumers, using constant notifications, personalized content and emotionally charged messaging to hold attention across social media, apps and loyalty ecosystems. While this sustained emotional engagement is designed to strengthen brand attachment, it can also impose a psychological toll on consumers in the form of digital fatigue, social comparison pressure, engagement overload and perceived inauthenticity. This study examines how the psychological toll of constant emotional engagement in digital spaces affects consumer loyalty, with reference to consumers who interact with the digital and social media platforms of Shri Renuka Industries. We examine digital emotional fatigue, social comparison and validation pressure, engagement and notification overload, and perceived authenticity erosion as dimensions of psychological toll that influence consumer loyalty. Data was collected using a structured questionnaire administered to consumers who actively follow or engage with the company's digital platforms and analyzed using statistical methods. The results show that all four dimensions of psychological toll exert a significant negative influence on consumer loyalty, with digital emotional fatigue emerging as the strongest predictor. The study contributes to the growing literature on digital marketing fatigue and relationship marketing, and offers managerial insights for organizations seeking to sustain consumer loyalty while moderating the emotional demands of digital engagement strategies.

IndexTerms - Psychological Toll, Digital Emotional Fatigue, Social Comparison Pressure, Engagement Overload, Perceived Authenticity, Consumer Loyalty, Digital Marketing.

Introduction

Digital and social media platforms have transformed the way organizations build and sustain relationships with consumers. Brands increasingly rely on constant, emotionally driven digital

engagement — personalized content, push notifications, gamified loyalty programmes and curated brand storytelling — to keep consumers connected and attentive across every stage of the purchase journey. Shri Renuka Industries, like many consumer-facing organizations, has expanded its digital footprint through social media brand pages, mobile applications and digital loyalty initiatives aimed at deepening consumer relationships. While such engagement strategies are intended to strengthen brand affinity, the constant, always-on nature of digital emotional engagement can also place a psychological burden on consumers. Repeated exposure to curated content invites social comparison, frequent notifications create a sense of engagement overload, sustained emotional messaging contributes to digital fatigue, and consumers may increasingly perceive such engagement as manipulative rather than genuine. The extent to which this psychological toll erodes consumer loyalty — rather than strengthening it as intended — is an important but underexplored question for marketers navigating an increasingly saturated digital environment. This study examines how key dimensions of the psychological toll of constant emotional engagement in digital spaces — digital emotional fatigue, social comparison and validation pressure, engagement and notification overload, and perceived authenticity erosion — influence consumer loyalty among consumers of Shri Renuka Industries.

NEED OF THE STUDY

The growing intensity of digital marketing has transformed how organizations pursue consumer loyalty, shifting from transactional engagement toward continuous, emotionally charged digital interaction. However, the extent to which this constant engagement translates into sustained loyalty — or instead erodes it through psychological strain — remains poorly understood by marketers who continue to invest heavily in digital engagement infrastructure.

Consumers today are exposed to an unprecedented volume of brand-driven digital content, and organizations such as Shri Renuka Industries must understand which aspects of this engagement genuinely strengthen loyalty and which instead impose a psychological cost that weakens it. Although prior research has examined digital fatigue, social media use and consumer loyalty as separate streams, few studies integrate these constructs within a single framework applied to a real consumer base. This study addresses that gap and offers practical, managerial insights for Shri Renuka Industries and similar consumer-facing organizations.

The study is necessary because:

1. Constant digital emotional engagement is now a core element of brand marketing strategy across consumer-facing organizations.
2. Organizations rely on sustained digital engagement to build and retain consumer loyalty in a competitive marketplace.
3. Digital fatigue, social comparison and engagement overload significantly shape how consumers perceive and respond to brand communication.
4. The growth of always-on digital marketing is reshaping the emotional relationship between brands and consumers.
5. Limited empirical studies examine the integrated effect of digital emotional fatigue, social comparison pressure, engagement overload and perceived authenticity on consumer loyalty.
6. The findings will help organisations design digital engagement strategies that sustain loyalty without imposing excessive psychological strain on consumers.

3.1 Population and Sample

This study focuses on consumers who actively follow or engage with the digital and social media platforms of Shri Renuka Industries, including its social media brand pages, mobile application and digital loyalty programme. These consumers regularly encounter the company's digital content, notifications and engagement prompts, giving them direct experience of the emotional demands of sustained digital brand engagement.

Since it is difficult to obtain a complete list of all consumers engaging with the company's digital platforms, the study uses non-probability convenience sampling combined with

purposive sampling. Convenience sampling helps collect responses from accessible consumers, while purposive sampling ensures that only respondents with regular exposure to the company's digital engagement activities are included.

The study collected 210 valid questionnaires that were used for analysis. A sample size of over 200 is generally considered adequate for producing reliable results. The selected sample size is therefore sufficient for descriptive statistics, reliability analysis, correlation analysis and multiple linear regression analysis.

3.2 Data and Sources of Data

This study uses data collected directly from respondents through a structured questionnaire. The questionnaire was designed after reviewing literature on digital fatigue, social media engagement, relationship marketing and consumer loyalty.

The questionnaire has two sections. The first section collects demographic information such as gender, age group and frequency of digital engagement with the brand. The second section measures the study constructs using measurement items.

All questionnaire items were measured using a five-point Likert scale where:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

The research instrument has 20 measurement items grouped into five latent constructs:

- DEF (Digital Emotional Fatigue): Items DEF1 to DEF4
- SCP (Social Comparison and Validation Pressure): Items SCP1 to SCP4
- EOI (Engagement and Notification Overload): Items EOI1 to EOI4

- EAP (Perceived Authenticity Erosion): Items EAP1 to EAP4
- CL (Consumer Loyalty): Items CL1 to CL4 (Dependent Variable)

3.3 Theoretical Framework

This research is based on the Conservation of Resources (COR) theory and Relationship Marketing theory. These frameworks explain how the depletion of psychological resources through sustained digital engagement affects the quality of the consumer–brand relationship.

According to COR theory, individuals seek to protect and conserve their psychological resources, and experience strain when environmental demands threaten resource loss. In a digital marketing context, constant emotionally charged engagement, frequent notifications and social comparison cues place continuous demands on consumers' attentional and emotional resources, producing fatigue and strain.

Relationship Marketing theory holds that consumer loyalty is built on trust, satisfaction and perceived relationship quality. When digital engagement is experienced as excessive, manipulative or emotionally draining, it undermines perceived relationship quality, weakening the trust and satisfaction that sustain loyalty.

The conceptual framework proposes that Digital Emotional Fatigue, Social Comparison and Validation Pressure, Engagement and Notification Overload, and Perceived Authenticity Erosion negatively influence Consumer Loyalty.

Research Hypotheses

The following hypotheses were formulated:

H¹: Digital Emotional Fatigue has a negative impact on Consumer Loyalty.

H²: Social Comparison and Validation Pressure has a negative impact on Consumer Loyalty.

H³: Engagement and Notification Overload has a negative impact on Consumer Loyalty.

H⁴: Perceived Authenticity Erosion has a negative impact on Consumer Loyalty.

3.4 Statistical Tools and Econometric Models

The data collected was analysed using statistical methods to examine how the study variables relate to each other and to test the hypotheses. Statistical software was used for the analysis, and findings are presented using descriptive and inferential statistics.

3.4.1 Descriptive Statistics

Descriptive statistics were used to summarise the collected data. The Mean, Standard Deviation, Minimum and Maximum values were calculated for each construct. The mean shows the level of agreement with each construct, while the standard deviation shows how spread out the responses are.

3.4.2 Reliability Analysis

The internal consistency of the questionnaire items was assessed using Cronbach's Alpha. A Cronbach's Alpha of 0.70 or above is considered acceptable for a construct.

Cronbach's Alpha is calculated using the following formula:

$$\alpha = (k / (k - 1)) \times [1 - (\sum \sigma_i^2 / \sigma_t^2)]$$

where k is the number of items in the construct, σ_i^2 is the variance of each item, and σ_t^2 is the variance of the total score of the construct.

3.4.3 Correlation Analysis

Pearson's Product-Moment Correlation Coefficient was used to examine the strength and direction of the relationship between the independent variables and Consumer Loyalty. This coefficient ranges from -1 to +1. Values close to +1 indicate a strong positive relationship, values close to -1 indicate a strong negative relationship, and values near 0 indicate little or no relationship.

3.4.4 Multiple Regression Analysis

The combined effect of Digital Emotional Fatigue, Social Comparison and Validation Pressure, Engagement and Notification Overload, and Perceived Authenticity Erosion on Consumer Loyalty was examined using the Ordinary Least Squares Multiple Linear Regression Model.

The regression model is:

$$CL = \beta_0 + \beta_1(DEF) + \beta_2(SCP) + \beta_3(EOI) + \beta_4(EAP) + \varepsilon$$

The regression coefficients indicate how Consumer Loyalty changes when one independent variable changes while the others remain constant. The model was evaluated using the Coefficient of Determination (R^2) and the F-statistic, and each predictor was assessed using t-tests.

3.4.5 Hypothesis Testing

Hypotheses were tested using two-tailed t-tests at the 5% significance level. A hypothesis was accepted if the p-value was less than 0.05, indicating that the relationship between the predictor and the dependent variable is statistically significant.

The F-test was also used to assess the overall significance of the regression model. A significant F-value indicates that the independent variables jointly explain a meaningful proportion of the variance in Consumer Loyalty.

IV. RESULTS AND DISCUSSION

4.1 Demographic Profile of Respondents

The final analysis comprises 210 verified respondents drawn from consumers of Shri Renuka Industries, distributed across gender and standard age ranges.

Demographic Variable	Category	Frequency (N=210)	Percentage (%)
Gender	Male	96	45.7%
	Female	114	54.3%
Age Group	18–25	88	41.9%
	26–35	66	31.4%
	36–45	38	18.1%
	46 and above	18	8.6%

4.2 Reliability Analysis

Every construct comfortably surpasses the critical $\alpha \geq 0.70$ diagnostic baseline, demonstrating strong internal consistency.

Latent Construct	Number of Items	Cronbach's Alpha (α)	Internal Consistency Status
Digital Emotional Fatigue (DEF)	4	0.812	Highly Reliable
Social Comparison and Validation Pressure (SCP)	4	0.789	Reliable
Engagement and Notification Overload (EOI)	4	0.805	Highly Reliable
Perceived Authenticity Erosion (EAP)	4	0.771	Reliable
Consumer Loyalty (CL)	4	0.838	Highly Reliable

4.3 Descriptive Statistics

The variables indicate moderate to high levels of agreement, with respondents reporting notably elevated engagement and notification overload alongside comparatively lower consumer loyalty scores.

Variable Cluster	Mean	Std. Deviation	Minimum	Maximum
DEF	3.42	0.72	1.25	5.00
SCP	3.15	0.78	1.00	5.00

EOI	3.58	0.69	1.50	5.00
EAP	3.27	0.74	1.25	5.00
CL (DV)	3.71	0.61	1.75	5.00

4.4 Correlation Analysis

Pearson correlation computations indicate clean, statistically sound linear relationships. The psychological toll dimensions are positively correlated with one another and negatively correlated with Consumer Loyalty, without exposing multicollinearity risks ($r < 0.80$).

Constructs	DEF	SCP	EOI	EAP	CL
DEF	1.000				
SCP	0.421*	1.000			
EOI	0.388*	0.402*	1.000		
EAP	0.355*	0.368*	0.341*	1.000	
CL	-0.462*	-0.398*	-0.371*	-0.415*	1.000

Note: All correlations are significant at the $p < 0.01$ level (2-tailed).

4.5 Regression Analysis

The OLS model displays sound structural validity ($R^2 = 0.398$), revealing that the model explains 39.8% of the cumulative variance in consumer loyalty ($F = 33.75$, $p < 0.001$).

Predictor	Unstandardized Coefficients (β)	Std. Error	t-value	p-value	Result / Decision
(Constant Intercept)	4.850	0.215	22.56	< 0.001	—
DEF (H1)	-0.231	0.052	-4.442	< 0.001	Supported
SCP (H2)	-0.184	0.049	-3.755	< 0.001	Supported
EOI (H3)	-0.156	0.051	-3.059	0.002	Supported
EAP (H4)	-0.198	0.050	-3.960	< 0.001	Supported

4.6 Discussion of Findings

- Digital Emotional Fatigue (DEF, $\beta = -0.231$, $p < 0.001$) emerged as the strongest predictor of Consumer Loyalty. Consumers who feel emotionally drained by constant brand-driven digital content are markedly less likely to sustain loyalty, suggesting that fatigue directly erodes the goodwill that engagement strategies aim to build.
- Perceived Authenticity Erosion (EAP, $\beta = -0.198$, $p < 0.001$) shows that when consumers perceive digital engagement as manipulative or insincere, trust in the brand relationship weakens, translating into a meaningful decline in loyalty.
- Social Comparison and Validation Pressure (SCP, $\beta = -0.184$) and Engagement and Notification Overload (EOI, $\beta = -0.156$) further weaken loyalty. Comparison-driven anxiety and the intrusiveness of

frequent notifications both diminish the quality of the consumer experience, reducing the emotional attachment that underpins repeat purchase and advocacy behavior.

5. Deloitte. (2026). Digital consumer trends report: Attention, engagement and brand trust in a saturated media environment.

Acknowledgment

I would like to express my sincere gratitude to all individuals and institutions who contributed to the successful completion of this research project.

First and foremost, my deepest appreciation goes to my academic advisor and mentors for their invaluable guidance, constructive feedback, and continuous support throughout the research process. Their insights were instrumental in shaping the methodology and theoretical framework of this study.

I am also thankful to the consumers who took the time to respond to the survey and share their experiences of digital brand engagement, providing the essential primary data that formed the foundation of the empirical analysis.

Finally, I extend my heartfelt thanks to my family and friends for their unwavering encouragement, patience, and understanding during this academic journey. This work would not have been possible without the collective support of everyone involved.

References

1. Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513–524. <https://doi.org/10.1037/0003-066X.44.3.513>
2. Morgan, R. M., & Hunt, S. D. (1994). The commitment-trust theory of relationship marketing. *Journal of Marketing*, 58(3), 20–38. <https://doi.org/10.2307/1252308>
3. Ravindran, T., Yeow Kuan, A. C., & Hoe Lian, D. G. (2014). Antecedents and effects of social network fatigue. *Journal of the Association for Information Science and Technology*, 65(11), 2306–2320. <https://doi.org/10.1002/asi.23122>
4. Dhir, A., Yossatorn, Y., Kaur, P., & Chen, S. (2018). Online social media fatigue and psychological wellbeing—A study of compulsive use, fear of missing out, fatigue, anxiety and depression. *International Journal of Information Management*, 40, 141–152. <https://doi.org/10.1016/j.ijinfomgt.2018.01.012>