The Role of Artificial Intelligence in Enhancing Content Recommendation Systems and Consumer Engagement on OTT Platforms in Lucknow

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ABSTRACT

With the rapid development of Artificial intelligence (AI) and the proliferation of Over-the-top (OTT) platforms in Indian markets, Artificial intelligence plays a important role in enhancing content recommendation on OTT platforms, particularly for regional specific preferences. After reading a lot of previous literature, it was found that no research has been done on this topic. This research aims to study the role of Artificial intelligence in enhancing content recommendation systems and consumer engagement on OTT platforms in Lucknow. A quantitative survey of 303 OTT consumers in Lucknow was conducted. Data were analyzed in Microsoft Excel to major four objectives relating to AI awareness, engagement and trust, consumer behavior, and demographic effects. To know the consumer opinion we used AntConc software and for visualizing 10 themes generated from software we used R-Programming. Having additional knowledge of AI highly enhances user satisfaction with OTT platform AI recommendations. OTT ratings are highly correlated with AI satisfaction, and unsubscribers are far less satisfied with recommended content. Though there is not much influence from gender on attitudes toward AI or trust. These findings underscore how strongly user satisfaction and retention are influenced by AI awareness, trust, and interaction.

Keywords: Artificial Intelligence, Content Recommendation Systems, Consumer Engagement, OTT Platforms, Personalization.

Introduction

Artificial intelligence play an important role for inspiring consumer to adopt Over-the-top (OTT) platforms in place of TV. With new advances in digital technology and the telecom industry, the entertainment sector has applied new methods, particularly in terms of content distribution. Streaming services, or OTT platforms, have become the new method consumers engage with content (Tyagi & Nitin, 2024). OTT is "A service platform on the Internet that delivers video streaming (such as Netflix) or communication service (such as line). For example, OTT TV is a broadcast platform not depending on traditional ones because its consumers use video application services through the Internet and thus it is an alternative to cable TV and the reverse, and its boom or collapse influences cable TV subscribers and therefore revenue (Ahuja, 2020). Through the use of AI algorithms to analyze large amounts of user data, sites can offer users content that is framed around their viewing habits, interests, and tastes. Due to exposure to lesser-known titles that are suited to their interests, such personalization not only raises user satisfaction but also content discovery. This can be advantageous to content creators and the business as a whole because users tend to engage more with an assortment of varying content rather than the mainstream (Singh et al., 2024). According to Statista (2023), in 2022, 3.26 billion people watched OTT videos, 3.51 billion in 2023, and then an expected 4.22 billion individuals by 2027. In 2027, the OTT platform market will be $462.90 billion in value, with a compound annual growth rate (CAGR) of 10.01%. (Khanna et al., 2024). After reading lots of research paper we found that there are lots of research paper

available on role of AI in social media marketing (Henry, 2019), role of AI in achieving sustainable development goal (Vinuesa et al., 2020), role of Artificial intelligence in online shopping and its impact on consumer purchasing behaviour and decision (Jangara & Jangara, 2024), & Artificial intelligence vs. autonomous decision-making in streaming platforms: A mixed-method approach (Gonçalves et al., 2024) but not a single research has been done on the topic role of AI in enhancing content recommendation systems and consumer engagement on OTT platforms, especially in the Lucknow city. In recent years, AI-driven personalized content experiences improve consumer retention and satisfaction. Considering the importance of AI in every field and rapid change of consumer preferences from traditional media to OTT platforms due to ease and internet availability, this study aims to fill this gap and provide insights that can improve OTT platforms' content recommendations systems. It also contributes to the academic understanding of localized digital consumption behaviours. The main objective of the present study is to examine the role of Artificial intelligence in enhancing content recommendation systems and its impact on consumer engagement on OTT platforms.

Review of Literature

Tyagi and Nitin K (2024) examined the consumer behavior towards the adoption of online streaming services, known as Over-the-Top (OTT), by bringing regulatory issues related to the data on these platforms and analyzing the monetizing strategies. The paper based on thematic and theoretical approach. Finding of the study indicated that OTT market were rapidly growing but there were no specific law governing content on OTT platforms. Considering its consumption and subscription rate growing so rapidly Ministry of information and broadcasting (MIB) introduced the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021, these new laws require OTT platforms to have a robust, three-tier grievance redressal system for the regulation. AI-enabled content curation in over-the-top (OTT) platforms and the delicate balance between personalization and user privacy become increasingly sophisticated, concerns about data privacy, algorithmic bias, and transparency have grown so Singh et al. (2024) analyzed the benefits and challenges of AI-powered content curation and proposed techniques for maintaining the equilibrium between safeguarding privacy and providing personalized information. Ahuja (2020) investigated various effects of web series and streaming content on the Indian youth. A structured questionnaire has prepared for investigation. Result highlighted major four factors:-Psychological, Social, Cultural and Demographic that effects of web series and streaming content on the youth of Bihar. Biju and Gayathri (2024) studied how the intelligent algorithms affect personal freedoms of weaker sections, particularly the right to choice, and whether they reinforce existing social biases within Indian society.

Henry (2019) evaluated the potential (means possibilities and strength) of Artificial intelligence in social media marketing and simulating artificial intelligence in commercial organizations to improve marketing for raise sales. Findings of the study indicated that when AI is used in social media analysis companies are more capable of understanding and fulfilling the distinctive desires of their customers. AI assists companies in growing in the right manner by analyzing existing market trends. By being able to fulfill consumer demands better, it significantly enhances customer service and enhances business success. As AI technology evolves, new opportunities for businesses to be more successful emerge. In the era of innovative technologies Khanna et al. (2025) examined the research landscape and advancements in OTT services and finding of the study focused on previous literature to understand new development in this field. The authors of the study derived six major themes related to OTT, named as:- (a) OTT infrastructure and technology advancement, (b) OTT consumption behaviour,(c) shifting trends towards OTT platforms, (d) viewers' engagement in digital media, (e) OTT in the global market, (f) OTT policies and regulatory mechanisms; however, the study did not role of artificial intelligence in this domain and provides a potential research gap for the paper.

Objectives

- To examine the relationship between users' awareness of AI and their satisfaction with AI-based recommendations.
- To assess the influence of trust and engagement frequency on continued OTT usage.
- To explore the relationship between consumer subscription behavior and perceived AI recommendation quality.
- To evaluate the effect of demographic factors on AI trust and engagement with OTT platforms.
- To understand different types of recommendations suggested by respondents regarding improvements in AI content recommendation systems.

Research Methodology

The study focus on the relationships between AI awareness, user engagement, trust, and satisfaction on OTT platforms, for this a survey was conducted through a structured questionnaire to collect numerical information from OTT platforms users. A Quantitative research design was used in this research and total sample size is 303 from Lucknow region only.

A purposive sampling method was used to collect data from the consumer. Data were analyzed using Microsoft Excel and to know the consumer opinion to improve the AI-based content recommendation system we used AntConc software and for visualization we used R-Programming. Regression analysis examined how trust and engagement predict satisfaction and platform use. Pearson's correlation measured relationships between continuous variables like engagement and viewing hours. Chi-square tests major associations between AI knowledge and satisfaction categories. T-tests compared satisfaction between unsubscribers and subscribers, and ANOVA tested usage differences across age groups. Significance was set at $p < .05$.

Data Analysis

This section presents the analysis of the primary data collected for the study. The aim is to test the hypothesis developed in alignment with research objectives.

H_{1a}: There is a positive association between AI knowledge and happiness with AI recommendations.

H_{0a}: There is a no positive association between AI knowledge and happiness with AI recommendations.

Table 1: Shows the Chi-Square Result

Test Statistics	Value
Xsquare	157.46
df(Degree of freedom)	2
P-Value	6.42681E-35
Ho	Rejected(P<0.05)

The Chi-square test is independence was used to examine the association between Knowledge about AI and happiness with AI recommendation system. The result showed a chi-square value of 157.46 and p-value is 6.42681E-35. Since P-value is much less than 0.05 so therefore, the test is highly significant and null hypothesis is rejected, hence it hence it can be concluded that there is a highly significant association between both variable. IT means AI knowledge highly affect consumer happiness with AI recommendation systems.

$H2_{1a}$: Engagement frequency is significantly related to daily OTT viewing hours.

$H2_{0}a$: Engagement frequency is not significantly related to daily OTT viewing hours.

A correlation analysis was conducted to examine the relationship between engagement frequency and daily OTT viewing hours. The correlation is 0. 0.74473, indicates that engagement frequency is significantly related to daily OTT viewing hours, means null hypothesis is rejected.

$H2_{1b}$: Trust in data use is significantly influences satisfaction with AI recommendations.

$H2_{0b}$: Trust in data use is not significantly influences satisfaction with AI recommendations.

Summary Table

Regression Statistics	
Multiple R	0.843012
R Square	0.710668
Adjusted R Square	0.709707
Standard Error	0.599431
Observations	303

Anova Table

	df	SS	MS	F	Significance F
Regression	1	265.654	265.654	739.329	4.74E-83
Residual	301	108.1546	0.359318		
Total	302	373.8086			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.434062	0.075816	5.725205	2.5E-08	0.284866	0.583259	0.284866	0.583259
Trust Data	0.738036	0.027143	27.19061	4.74E-83	0.684622	0.79145	0.684622	0.79145

Table 2,3,4 Shows the summary output of regression statistics, Anova table and Correlation table.

For examined, trust in data use is significantly influences satisfaction with AI recommendation, regression analysis is used and the regression table showed R (Multiple R): 0.843 A strong positive correlation between trust in data and OTT viewing hours. R^2 (R Square): 0.711 Approximately 71.1% of the variance in daily OTT viewing hours is explained by trust in data. Adjusted R^2: 0.710 Adjusts for sample size and number of predictors (still strong, indicating a well-fitting model). Standard Error: 0.599 Average distance that the observed values fall from the regression line. F-statistic: 739.33 Significance F (p-value) is 4.74E-83 mean less than 0.05, so null hypothesis is rejected. The regression model is statistically significant, meaning the trust in data significantly influence OTT viewing hours.

H2$_{1c}$:   Perceived improvement in AI recommendations positively impacts continued usage.

H2$_{0c}$:   Perceived improvement in AI recommendations is not positively impacts continued usage.

Summary Output

Regression Statistics	
Multiple R	0.826278
R Square	0.682735
Adjusted R Square	0.681681
Standard Error	0.604321
Observations	303

Anova Table

	df	SS	MS	F	Significance F
Regression	1	236.5554	236.5554	647.7349	5.11E-77
Residual	301	109.9264	0.365204		
Total	302	346.4818			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.417361	0.07857	5.311953	2.11E-07	0.262745	0.571978	0.262745	0.571978
Platform Learning	0.824795	0.032408	25.45064	5.11E-77	0.76102	0.888569	0.76102	0.888569

Table 5,6,7 Shows the summary output of regression statistics, Anova table and Correlation table.

The regression analysis showed a strong, positive, and significant effect of perceived improvement in AI recommendations on continued usage multiple R is 0.826278 It indicate correlation between both variable, β is 0.825, p is less than 0.05 (5.11E-77) means the null hypothesis is rejected. The model explained 68.3% of the variance in continued usage, supporting hypothesis that better AI recommendations lead to higher continued platform use.

H3$_{1a}$:   There is significant difference in happiness with AI recommendations between user who have unsubscribed and those who have not unsubscribed.

H3$_{0a}$:   There is no significant difference in the mean happiness with AI recommendations between user who have unsubscribed and those who have not unsubscribed.

	Yes Group (Unsubscribed)	No Group (Do not Unsubscribed)
Mean	3.107526882	4.076190476
Variance	1.510051426	0.817133743
Observations	93	210
Hypothesized Mean Difference	0	
df	138	
t Stat	-6.827634068	
P(T<=t) one-tail	1.26E-10	
t Critical one-tail	1.655970382	
P(T<=t) two-tail	2.51367E-10	
t Critical two-tail	1.977303542	

Table 8 shows the Yes group who unsubscribed OTT due to unhappy with AI recommendations and No group who don't unsubscribed.

Two-sample t-test assuming unequal variance is used to major the hypothesis that Have consumer/user ever unsubscribed from an OTT platform due to unsatisfactory content recommendations or not. The result from the above table showed that mean happiness score (3.11) of user who unsubscribed due to unsatisfactory content recommendations less than the mean happiness score (4.08) of user who do not unsubscribed, t-statistics is -0.6828 and p-value - 2.51367E-10 (2.51 × 10^{-10}) is much lower than 0.05, indicating strong statistical significance. According to the test result null hypothesis is rejected which means there is a statistically significant difference in mean happiness with AI recommendations between users who unsubscribed and those who did not.

$H3_{b1}$:   There is positive correlation between OTT platform rating and user happiness.

$H3_{b0}$:   There is no positive correlation between OTT platform rating and user happiness.

	Happy Recommendation	Overall Experience
User Happiness	1	
Overall Exp (GE Q3)	0.596855226	1

Table 9 shows correlation between happy recommendation and overall experience.

The correlation between OTT platform rating patterns and user happiness with AI recommendations is 0.5968, means there is moderate to strong positive correlation between both variables, showing that users who are more-happy with AI recommendations tend to rate the overall platform experience more positively.

$H4_{a1}$:   There is significant difference in mean OTT usage frequency across different age groups

$H4_{a0}$:   There is no significant difference in mean OTT usage frequency across different age groups.

Summary				
Groups	Count	Sum	Average	Variance
Below 18	13	25	1.923077	1.24359
18-25	237	416	1.755274	0.872059
26-35	43	98	2.27907	1.396456
36-50	10	25	2.5	1.388889

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	14.29807	3	4.766024	4.882282	0.002497	2.634801
Within Groups	291.8801	299	0.976188			
Total	306.1782	302				

Table 10 & 11 Shows the summary of group, count, sum, average and variance and ANOVA output- sum of square (SS), mean square (MS) degree of freedom (df), F-statistics, p-value and f-crit

Anova single factor was conducted to compare the effect of four different age group on OTT usages frequency. F=4.766024, p-value is 0.002497 less than 0.05 so the result showed a statistical significant difference in mean scores of OTT usages frequency and different age group. Since the p-value is less than 0.05, we reject the null hypothesis and concluded at least one age group significantly affects OTT usages frequency.

$H4_{b1}$:   There is a significant association between gender and perception of AI recommendations.

$H4_{b0}$:   There is no significant association between gender and perception of AI recommendations.

Test Statistics	Value
Xsquare	0.81
df (Degree of freedom)	1
P-Value	0.3681
Ho (Null Hypothesis)	Accepted (P>0.05)

Table 12 Shows the Chi-square result.

The Chi-square test is independence was used to examine the association between gender about perception of AI recommendation system. The result showed a chi-square value of 0.81 and p-

value is 0.3681. Since P-value is much greater than 0.05 so therefore, the test is not significant and null hypothesis is accepted, hence it can be concluded that there is no association between gender and perception of AI recommendations. It means being male or female does not affect their thinking about AI-driven recommendations make OTT platforms more attractive than traditional TV viewing.

H4$_{c1}$:   There is a significant difference between gender and their trust toward AI recommendations.

**H4$_{c0}$:**   There is no significant difference between gender and their trust toward AI recommendations.

	Male Trust	Female Trust
Mean	2.529032258	2.425675676
Variance	1.614411395	1.620288656
Observations	155	148
Pooled Variance	1.617281685	
Hypothesized Mean Difference	0	
df	301	
t Statistics	0.707164904	
P(T<=t) one-tail	0.240005562	
t Critical one-tail	1.649931694	
P(T<=t) two-tail	0.480011125	
t Critical two-tail	1.967876531	

Table 13 shows the male trust group & female trust group for OTT platforms.

Two-sample t-test assuming equal variance is used to major the hypothesis that have gender affects their trust level on OTT platforms due to AI recommendations. The result from the above table showed that mean male trust score (2.53), who trust on OTT platforms due to AI content recommendations approximately equal to the mean female trust score (2.43) who trust, t-statistics is 0.7072 and p-value -0.48 is much greater than 0.05, indicating not statistical significance. According to the test result null hypothesis is accepted which means there is no statistically significant difference in mean male trust with AI recommendations and female trust level with AI recommendations. Conclusively se can say there is no significant difference between gender and their trust toward AI recommendations.

Consumer Suggestions to Improve AI Content Recommendation Systems

For understanding different types of recommendations suggested by respondents regarding improvements in AI content recommendation systems we used thematic analysis by AntConc Software. When I double-clicked KWIC in AntConc program, I initially viewed the word frequency under recommendation, where the most frequent word was "content" with 37 occurrences, and the word "recommendation," a precious keyword, occurred 15 times. From this analysis, we identified the top 10 themes most frequently recommended by consumers or users to improve recommendation systems. These 10 themes were then graphically displayed using R-Studio program. X-axis- Themes (e.g., personalization, safety, context awareness etc.), Y-axis- Frequency. We used colour coding, yellow bar represent themes common to both "recommendation and content", red bars are specific to content and blue bars are specific to recommendations.
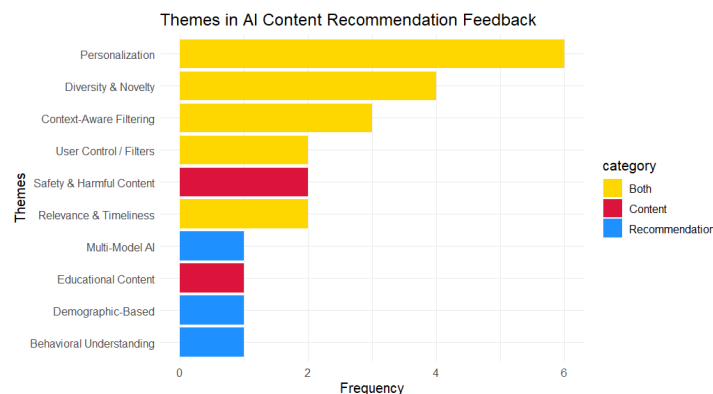
Source: Visualization generated by R Programming

Figure 1: Shows the Consumers Opinion to Improve the AI Recommendation Systems

Findings and Discussion

In the modern era, Artificial Intelligence is an important component in all industries, and its inclusion in Over-The-Top (OTT) platforms has greatly revolutionized the manner in which content is suggested and watched. The current research investigated how AI contributes to enriching content recommendation systems and customers' interaction particularly with reference to Lucknow. Based on collected data the findings of the study emerged- A significant association was exist between AI knowledge and satisfaction with AI-driven recommendations (χ^2 = 157, df = 2, p < 0.05), suggesting that better-informed users report higher satisfaction. Engagement frequency was strongly correlated with daily OTT usage hours (r = 0.77). Trust in data use significantly influenced satisfaction with recommendations (r = 0.84, R^2 = 0.71, p = 4.74×10^{-83}). Perceived improvement in AI recommendations was found to strongly predict continued platform usage (r = 0.82, R^2 = 0.68, p = 5.11×10^{-77}). Users who had unsubscribed were significantly less happy with recommendations (t = –6.82, p < 0.001; Mean$_1$ = 3.10, Mean$_2$ = 4.07). A moderate positive correlation between OTT platform rating and AI satisfaction (r = 0.5968). Age significantly influenced frequency of OTT usage (F = 4.88, p = 0.0024). There is no significant association was found between gender and perception of AI-driven recommendation attractiveness (χ^2 = 0.81, p = 0.3681). Similarly, no significant gender difference was observed in trust toward AI systems (t = 0.7071, p > 0.05). There are basically 10 types of recommendations suggested by respondents regarding improvements in AI content recommendation systems. These recommendations are Personalization, Diversity and novelty, Context-aware filtering, User control, Safety and harmful content, Relevance and timeliness, Multi-model AI, Educational content, Demographic based and Behavioural understanding. The finding of the study highlights that involvement of artificial intelligence in content recommendations system of OTT platforms, particularly in enhancing user engagement and personalizing content delivery. As OTT consumption rapidly grow in city like Lucknow, AI-driven recommendation systems have become important in retaining consumer attention and improving user satisfaction. Moreover, the study supports existing literature that suggests increased engagement through personalization.

Limitations and Future Research

While this study have play an essential role to know how AI-recommendation system enhance content recommendations and consumer engagement on OTT platforms but there are several limitations. The study was limited to the city of Lucknow. Second limitations of the study is that the study did not conducted a comparative analysis between different types of OTT platforms or AI-recommendations or non AI-recommendations systems to understand which OTT platforms provides more personalized content, so future researcher can focus on this point. A comparative analysis can also be done between two cities. Third limitation of the study is that the research did not pay attention to examining users' language-dependent content preferences (e.g., liking Hindi, English, or local languages such as Bhojpuri or Awadhi etc.). so, it does not entirely reflect the way AI suggestions might diverge along linguistic groups, future research can also focus on this area.

Conclusion

The study examined the Role of Artificial Intelligence in Enhancing Content Recommendation Systems and Consumer Engagement on OTT Platforms in Lucknow. By identifying the significant role of AI awareness, trust in data use, and personalized content recommendations, OTT service providers can improve user satisfaction and retention. Knowing user behavior by demographics also enables platforms to customize approaches for approachable engagement, particularly in rising cities such as Lucknow. These are important insights for media planners, advertisers, as well as regulatory authorities looking to improve digital content rendering, optimize AI algorithms, and maintain ethical data usage. Results indicate that higher AI knowledge significantly enhances satisfaction with AI-driven recommendations. Although trust in data usage is essential in affecting recommendation satisfaction and repeated platform usage, frequent usage is significantly associated with boosted daily OTT consumption. Consumer behavior analysis indicates that increased OTT ratings significantly related with more AI satisfaction, whereas unsubscribers are less satisfied with recommendations. Age significantly affects the incidence of OTT consumption based on demographics, while gender does not influence one's experience with AI recommendations or trust. These results indicate significant factors in user experience and retention for OTT services based on AI.

References

1.　Tyagi, P., & Nitin, K. (2024). Rise of OTT platforms in India: A case study of monetisation models & regulatory concerns. *Global Media Journal*, *22*, 68.

2.　Ahuja R (2020) A Study of Effects of Web-series & Streaming content on Indian Youth. IJCRT 89: 1042-1055.

3.　Singh, M., Sharma, K., Kaur, A., & Keshav. (2024). AI-enabled content curation in OTT platforms: Balancing personalization and privacy. In *Futuristic trends in artificial intelligence* (Vol. 3, Book 12, Part 7, Chapter 1)

4.　Jangra, G., & Jangra, M. (2022, September). Role of Artificial Intelligence in Online Shopping and its Impact on Consumer purchasing behaviour and Decision. In *2022 Second International Conference on Computer Science, Engineering and Applications (ICCSEA)* (pp. 1-7). IEEE.

5.　Vinuesa, R., Azizpour, H., Leite, I., Balaam, M., Dignum, V., Domisch, S., ... & Fuso Nerini, F. (2020). The role of artificial intelligence in achieving the Sustainable Development Goals. *Nature communications*, *11*(1), 233.

6.　Gonçalves, A. R., Pinto, D. C., Shuqair, S., Dalmoro, M., & Mattila, A. S. (2024). Artificial intelligence vs. autonomous decision-making in streaming platforms: A mixed-method approach. *International Journal of Information Management*, *76*, 102748.

7.　Henry, V. (2019). Role of artificial intelligence in social media marketing. *International Journal of Recent Technology and Engineering*, *8*(4), 66-69.

8.　Khanna, P., Sehgal, R., Gupta, A., Dubey, A. M., & Srivastava, R. (2025). Over-the-top (OTT) platforms: a review, synthesis and research directions. *Marketing Intelligence & Planning*, *43*(2), 323-348.

9.　Biju, P. R., & Gayathri, O. (2024). A Study of Ethical Implications of AI Tools Enhancing User Conveniences in the Indian Digital Landscape. *Journal of Social Computing*, *5*(3), 206-231.

10.　Smith, J., & Zhang, L. (2020). Artificial Intelligence in Media Consumption: A Review of OTT Recommendations. *Journal of Digital Media Studies*, 15(3), 45-60.

11.　Lee, C., & Kim, Y. (2019). Consumer Behavior on OTT Platforms: The Role of Personalization and Trust. *Journal of Marketing Research*, 48(2), 200-215.

12.　Sharma, M., & Rani, P. (2021). AI-Driven Content Recommendations in India: Impact on User Engagement and Loyalty. *International Journal of Digital Technologies*, 7(1), 120-135.

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