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Decoding Customer Concerns about Embracing Electric Cars in India: Analysis of Audience Sentiments on YouTube Autovlogs

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Abstract
The issue of climate change presents a global challenge, with transportation contributing significantly to carbon emissions. Transitioning to electric vehicles (EVs) is a crucial solution for emission mitigation. In India, initiatives like the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME II) aim to achieve a substantial market share of EVs by 2030. While the electric two-wheeler market has seen success, larger vehicle adoption faces economic and charging infrastructure challenges. This study analyses audience comments on YouTube auto vlogs to understand customer concerns about EV adoption in India. The analysis of 1598 comments reveals apprehensions regarding range, charging infrastructure, and battery life. Negative sentiments encompass high costs, battery reliability, resale value, and limited service centres, while positive sentiments express interest in EVs for their environmental benefits, cost-efficiency, advanced technology, and government incentives. The research highlights consumer scepticism alongside an optimistic group seeing EVs as the future of the automotive industry in India.

Keywords: Electric Vehicle, YouTube Channel, Autovlog, YouTube Comments, Audience, Social Media, Influencer Marketing

Introduction

The issue of climate change presents itself as a shared and pressing challenge confronting humanity at present. Transportation is responsible for 14% of the overall carbon emissions, and experts predict a substantial increase in the imminent future, with emissions projected to reach several million tons (Wang et al.). Transitioning towards electric vehicles (EVs) is a means to mitigate emissions (Chidambaram et al.). Electric vehicles (EVs) have become one of the most important technologies in the modern world due to their eco-friendly nature, cost-efficiency, and freedom from emissions.

In recent years, the Indian government has formulated various initiatives such as the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME II) to strive towards a significant increase in electric vehicle (EV) adoption (Goswami et al.). The government's ambitious vision is to achieve a considerable market share of EVs, aiming for 30 percent in the car segment, 70 percent in commercial vehicles, 40 percent in buses, and an impressive 80 percent in the two- and three-wheeler category by the year 2030 (Batraa; Press Trust of India, "EV Adoption Levels In India To See Exponential Growth: Report").

India has achieved remarkable success in the electric two-wheeler market, but duplicating this success for larger vehicles poses challenges. The favourable economics of two-wheeler electrics, driven by smaller and cheaper powerpacks, a battery-swapping trend reducing range anxiety, and increasing charging infrastructure, have made electric motorbikes affordable and less impacted by gas prices in daily household expenses (Trivedi; Rajper and Albrecht). While the economic challenges in India suggest that four-wheeled EVs may face a difficult journey due to their high cost compared to the benefits they offer. Moreover, inadequate power systems, inconsistent electricity supply in certain regions, and the need for higher capacity and voltage to charge larger batteries further hinder the establishment of a reliable charging network (Trivedi; Garg; Khan; Sachdev).

Considering the aforementioned discussions, the study seeks to explore customer concerns and reservations related to purchasing electric vehicles in India. This research involves an examination of the audience's comments on YouTube auto vlogs. According to the Meaningful Brands 2023 report conducted by Havas, YouTube emerged as the third most significant brand in India, providing substantial individual and collective advantages. The report emphasised the profound influence YouTube has on people's daily lives and its capacity to foster meaningful connections between individuals (Laghate). Thus, opting for YouTube as the platform for analysis is a rational decision.

Literature Review

Electric Vehicle Adoption

The adoption of electric mobility brings about a multitude of advantages, including a decrease in reliance on oil and the enhancement of environmental conditions. India, the world's fifth-largest economy, stands out with its emphasis on the widespread usage of two-wheeled vehicles like scooters, mopeds, and motorbikes, in contrast to the United States and China's primary focus on the adoption of electric cars (Jacob). Regardless of the growing popularity of EV technology worldwide, India has not yet made a significant impact in this sector. However, the Indian Government has outlined an ambitious and appealing roadmap for the development and adoption of pure electric vehicles (Sriram et al.).

While there is a widespread belief among consumers that Electric Vehicles (EVs) are not as advanced as traditional cars, it is of utmost importance to understand consumers' perspectives on EVs and recognise the obstacles that hinder their widespread adoption. Policy makers can utilise this valuable information to refine and enhance their electric mobility policies effectively. According to prior research (Eppstein et al.; Shafiei et al.; Sierzchula et al.; Ahmadi et al.; Noel et al.), the widespread adoption of electric vehicles (EVs) is hindered by their limited growth when not stimulated by external influences. The key external factors include stringent emissions regulations, escalating fuel prices, the availability of charging infrastructure, range, the presence of local production facilities, and financial incentives. Among these factors, consumer subsidies are singled out as essential for EVs to achieve mass-market acceptance. However, several governments, including those of China, America, and Germany, have expressed their plans to eliminate subsidies for electric vehicles (Wang et al.). In a recent move, the Indian government too has decided to significantly reduce subsidies for electric two-wheelers. Currently, the cap on incentives for these vehicles stands at 40% of the ex-factory price, but it will now be reduced to just 15% (Press Trust of India, "Sudden Reduction of Subsidy of Electric Two-Wheelers May Lead to Major Decline in EV Adoption: SMEV"). Electric vehicle manufacturers assert that the Indian government's intention to expand the two-wheeler market is met with roadblocks due to the reduction in subsidies, which presents a considerable obstacle for the emerging industry (Lidhoo). The majority of research on EV adoption is conducted in North American and European countries, whereas studies in India are limited (Khurana et al.). The prevailing circumstances, warrant conducting additional research into the attitudes of consumers regarding the adoption of electric vehicles in India.

Youtube Autovlogs

The realm of social networks is experiencing a significant surge in the popularity of vlog advertising, characterised by vloggers being paid to endorse and

showcase upcoming products (Hill et al.). Over the past few years, YouTube has undergone significant transformations, becoming a pivotal tool for brands to promote their products and services. Marketers have effectively utilized YouTube influencers to endorse their brands, leading to the dissemination of sponsored content among the influencers' followers (Acikgoz and Burnaz). As of January 2023, YouTube has secured the second spot in the list of the most widely used social networks worldwide, as per the recent statistics provided by Statista.com. With a remarkable user base of 2,514 million active users globally, YouTube continues to be a prominent platform for market and consumer engagement (Statista.com).

Numerous content creators on YouTube produce vlogs that have garnered significant popularity among their audience (Lee and Watkins). An increasingly well-received style of vlogging is the automobile vlog, which has gained significant popularity among content creators and audiences alike. In a study conducted by (Lim et al.), it was discovered that social media influencers play a crucial role in shaping purchase intentions among consumers. Their ability to offer trustworthy and highly valued opinions is the key factor contributing to this significant impact.

Every moment, an enormous volume of unstructured data is produced on the internet through social media platforms, and this data needs to be swiftly processed to understand human psychology (Nandwani and Verma). The commenting feature within a popular social media platform like YouTube enables users to express their thoughts, opinions, and inquiries related to the videos they watch (Kavitha et al.). Individuals who are willing to invest more than a few minutes in watching a YouTube video are more inclined to engage with it by liking and commenting, thus indicating higher viewer engagement (Munaro et al.). Moreover, popular YouTube videos receive an overwhelming inflow of comments from viewers, and these opinions play a crucial role for potential buyers when making purchasing decisions (Parabhoi and Saha). The sentiments expressed in comments, feedback, or critiques serve as valuable indicators for various purposes (Prabowo and Thelwall). Furthermore, these sentiments can be classified into two broad categories: positive and negative. From this perspective, sentiment analysis can be viewed as a classification task, where each sentiment category represents a distinct classification. Analysing these comments from YouTube videos can offer valuable perspectives on the audience's response to significant topics or content (Thelwall et al.).

Methodology

This research aims to analyse audience comments on YouTube auto vlogs to better understand customer concerns regarding the adoption of electric cars in India. This study differs from prior research (Sriram et al.; Khurana et al.) on identifying factors influencing the adoption of electric vehicles, as it takes an exploratory approach. Instead of utilising a survey method, it relies on secondary data extracted from viewer comments on the YouTube platform. The study collected comments from well-known YouTube automotive channels such as Autocar India, Fuel-injected, and MotorOctane. The comments were extracted from the YouTube channels using the Google Apps Script editor tool. A total of 1598 viewer comments were extracted from the afore mentioned YouTube channels. Subsequently, Word it out, a web-based word cloud tool, is utilised to generate word clouds from the comments, to identify the keywords. In the end, sentiment analysis was conducted to comprehend the underlying emotions or attitudes conveyed in the comments. The study employed the Azure Machine Learning Excel Plugin to conduct sentiment analysis and subsequently utilised a Pivot table to effectively summarise the data.

Result and Discussion

Autocar India's YouTube channel has achieved remarkable success, amassing an impressive subscriber count of 2,180,000 and accumulating a total of 820,426,909 video views. Consistently delivering quality content, the channel has uploaded an astounding 3,591 videos. Fuel Injected, another prominent YouTube channel, enjoys a substantial following of 553,000 users, with an engagement rate of 8.00%—slightly higher than similar channels in its tier. MotorOctane, on the other side, is a dedicated platform catering to discerning Indian car buyers, providing comprehensive and insightful

content. With a strong emphasis on delivering an enriching experience, MotorOctane features videos covering a wide range of beloved cars, making it an indispensable resource for informed decisions in the Indian automotive market. Garnering an impressive 814,623,071 video views on YouTube and boasting a massive subscriber base of 3,040,000 since its inception on December 31, 2012, MotorOctane solidifies its position as India's most renowned car and bike video platform. With 2,496 videos uploaded to date, MotorOctane continues to serve as a trusted source of expertise and guidance for Indian car and bike enthusiasts.

In order to extract YouTube comments efficiently, this study employed the Google Apps Script editor. Google Apps Script is a cloud-based scripting language that allows users to automate tasks and extend the functionality of various Google services, including YouTube. Google Apps Script allows the development of custom scripts to extract and analyse YouTube comments in a streamlined manner. The process involves using the YouTube Data API, which provides programmatic access to YouTube features and data, including comments on videos. By writing scripts in the Google Apps Script editor, one can establish an automated workflow to retrieve comments from YouTube videos, store them in a suitable data format, and perform subsequent analysis. Figure 1 shows the script used in this study to extract the comments from the YouTube channels contemplated in this study.

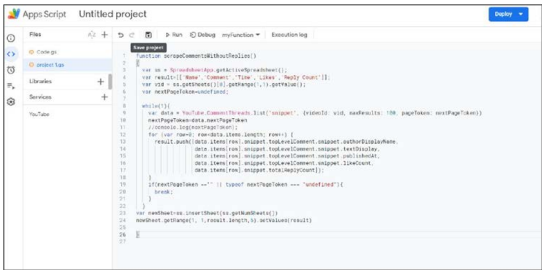

Figure 1 Script to Extract the Keywords

The script proved to be highly effective in gathering valuable data from user feedback, which served as a valuable resource for our research. Figure 2 displays the outcome of comments extraction. The comments were associated with their respective numbers of likes and replies. Nevertheless, the primary emphasis of the research was on investigating the keywords hidden in the comments, and hence relatively less attention was paid to the latter aspect.

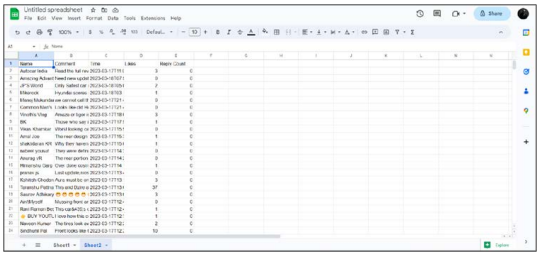

Figure 2 Extracted Comments

The results of sentiment analysis of 1598 comments generated using the Azure Machine Learning Excel Plugin are depicted in Figure 3. The analysis provides sentiments classified as positive, negative, and neutral, which are represented by scores ranging from 0.00000000483 to 0.999989569.

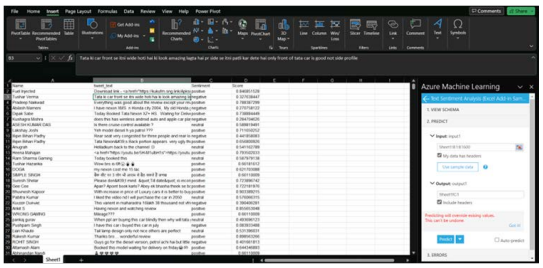

Figure 3 Sentiment Classification using Azure Machine Learning

In the positive sentiment classification, it indicates the presence of at least one positive word in the sentence while the rest of the sentence is considered neutral. Conversely, for negative sentiment classification, it suggests the existence of at least one negative word in the sentence, with the rest of the sentence being neutral. When the sentiment analysis yields a neutral result, it implies that all words in the sentence are neutral. The sentiment score is presented as a value between 0 and 1, where scores closer to 0 indicate negative sentiment, cores around 0.5 represent a neutral sentiment, and scores closer to 1 signify positive sentiment.

In Table 1, the summary of sentiment classification is presented. Among the collected text data, a considerable number of instances (290) displayed negative sentiments, while 206 instances

were categorised as neutral, and a significant majority (1102 instances) conveyed positive sentiments. The negative sentiments accounted for approximately 18.15% of all opinions, while positive sentiments constituted a dominant 68.96%, leaving the remaining 12.89% categorised as neutral. The average sentiment score for the negative instances was calculated to be 0.2267, suggesting a clear inclination towards negative attributes. Conversely, the average score for positive sentiments stood at 0.7503, indicating a strong inclination towards positive attributes. The average score for neutral statements was found to be close to 0.5, specifically 0.53.The collective score of 0.627(>0.5) indicates that the perception of viewers of the YouTube channel is moderately positive regarding the EV attributes offered by the manufacturers.

Table 1 Summary of Sentiment Classification

Sentiment classification	Count of sentiment	% of sentiments	Avg. sentiment score
Negative	290	18.15%	0.2267
Neutral	206	12.89%	0.5307
Positive	1102	68.96%	0.7503
Grand Total	1598	100.00%	0.6270

In order to identify the keywords, the study used Word It Out, a word cloud platform, where the size of each word corresponds to its frequency in the text. By generating a Word cloud, one can quickly identify the most common terms, allowing for a better understanding of the main themes or topics discussed in the text. Figure 4 exhibits the word cloud generated using the comments extracted. After multiple iterations of the tool, it has been observed that certain keywords frequently appear, such as worries regarding range anxiety, the accessibility of charging infrastructure, and battery longevity.

Figure 4 Wordcloud based on the Keywords

Upon further examination, it was noted that the positive sentiments expressed towards Electric Vehicles (EVs) in India are driven by their environmental benefits, cost-saving potential, high-end features, advanced technology, impressive performance, and government incentives. As a result, there is a growing interest and demand for electric vehicles in the country, signifying a shift towards more sustainable and efficient transportation options. While, the negative sentiments surrounding EV cars in India include their expensive nature, which can be attributed to the high cost of the battery technology utilized in these vehicles. Additionally, the reliability of EV car batteries raises concerns for potential buyers as they have a limited lifespan and might require frequent replacements or repairs, incurring additional expenses for owners. Another significant drawback is the poor resale value of EV cars in India. Due to their high initial cost and concerns about battery reliability, owners may struggle to obtain a reasonable price if they decide to sell their vehicles. Moreover, the lack of adequate service centres equipped to handle EV cars poses difficulties for owners seeking maintenance or repairs. This limited availability can lead to inconvenience and potentially increase the costs associated with servicing these vehicles. While electric cars are generally quieter than traditional petrol or diesel cars, they can still produce some noise due to the electric motor and other components, which might not align with the expectation of complete silence associated with EVs. Furthermore, the lack of a well-established charging infrastructure remains a significant challenge for EV car owners in India. With relatively few public charging stations and limited access to home charging options, many individuals face hurdles in effectively powering their electric vehicles. The findings of the

study align with previous research (Wang et al. and Sierzchula et al).

This study uncovers that the presence of both negative and positive keywords indicates a notable level of consumer apprehension and skepticism when considering the adoption of electric vehicles. Such concerns likely revolve around the potential drawbacks and limitations associated with owning an electric vehicle, leading some customers to perceive conventional gasoline-powered cars as a more viable alternative.

Conclusion

The study's findings shed light on the prevailing sentiments within comments, feedback, or critiques and their significant role in gauging consumer attitudes towards electric cars. Based on the comprehensive analysis of audience comments on the YouTube auto vlogs, Autocar, Fuel-Injected, and MotorOctane, the study identified several recurring customer apprehensions regarding the purchase of electric cars in India. These concerns revolve around the perceived high cost of electric vehicles, doubts about the reliability and durability of batteries, apprehensions about poor resale value, the lack of well-established charging infrastructure, limited driving range, and lengthy charging times.

Through the comments we examined, it is evident that there exists a prevalent sense of skepticism and hesitation concerning the practicality of electric cars, especially for long-distance travel. A significant number of commenters express frustration with the absence of sufficient government support for the widespread adoption of electric vehicles. They highlight issues such as the lack of charging infrastructure and the absence of incentives for potential electric car buyers.

Nevertheless, amid the apprehensions, we also discovered a substantial group of commenters who exhibit enthusiasm and optimism about electric cars, viewing them as the future of the automotive industry. They emphasise the environmental advantages of electric vehicles and the potential for reduced maintenance costs as compelling reasons to consider making the switch to electric.

The research has certain constraints related to the input gathered from viewers' comments on Tata Nexon videos uploaded by Auto Vlogs. We specifically selected Tata Nexon videos from Auto Vlogs due to the model's significant popularity as an electric vehicle in the country. Over the course of just three years, Tata successfully sold 50,000 cars, making it the highest-selling electric vehicle in India (Zee Media Bureau). This popularity might have influenced the comments received, potentially creating a bias towards positive sentiments due to viewers' favourable perceptions of the Tata brand and its leading model, the Nexon. Future research could overcome these limitations by considering a broader range of electric vehicles, including cars and scooters, for analysis. Additionally, expanding the analysis to include popular social media platforms such as Twitter, Facebook, and Instagram would widen the study's reach and provide a more comprehensive understanding of public perceptions towards EVs in general.

Overall, the analysis reveals a complex landscape of opinions surrounding electric cars in India. While considerable challenges and apprehensions persist, there is also an emerging interest and growing awareness of the potential benefits of electric vehicles. As technology continues to advance and government support for electric vehicle adoption strengthens, we can anticipate a more substantial shift towards electric cars in the Indian automotive market. This could lead to a transformative impact on the country's transportation sector, fostering sustainable and eco-friendly mobility options for the future.

References

Acikgoz, Fulya, and Sebnem Burnaz. "The Influence of 'Influencer Marketing' on YouTube Influencers." *International Journal of Internet Marketing and Advertising*, vol. 15, no. 2, 2021.

Ahmadi, Lena, et al. "Effect of Socio-Economic Factors on EV/HEV/PHEV Adoption Rate in Ontario." *Technological Forecasting and Social Change*, vol. 98, 2015, pp. 93-104.

Batraa, Mitull. "The State of EV Adoption in India: Unveiling the Promising Future of Battery E-Rickshaws and e-Rickshaw Loaders." *Times of India*, 2023.

Chidambaram, Kannan, et al. "Critical Analysis on the Implementation Barriers and Consumer

Perception toward Future Electric Mobility." *Proceedings of the Institution of Mechanical Engineers, Part D: Journal of Automobile Engineering*, vol. 237, no. 4, 2022, pp. 622-54.

Eppstein, Margaret J., et al. "An Agent-Based Model to Study Market Penetration of Plug-in Hybrid Electric Vehicles." *Energy Policy*, vol. 39, no. 6, 2011.

Garg, Arjit. "Exclusive - Challenges faced by Electric Vehicles to become the next big thing in India." *Zee News*, 2022.

Goswami, Arjun, et al. "Charging up the EV Sector through Policy Reform." *Business Today*, 2023.

Hill, Sally Rao, et al. "Signalling Effects of Vlogger Popularity on Online Consumers." *Journal of Computer Information Systems*, vol. 60, no. 1, 2017, pp. 76-84.

Jacob, Charmaine. "India is Learning to Love Electric Vehicles - but They're not Cars." *CNBC*, 2023.

Kavitha, K. M., et al. "Analysis and Classification of User Comments on YouTube Videos." *Procedia Computer Science*, vol. 177, 2020, pp. 593-98.

Khan, Irfan. "Lack of Charging Infra, High Costs: Challenges Facing India's Electric Bike Market, and the Way Ahead." *ABP News*, 2023.

Khurana, Anil, et al. "A Study on the Adoption of Electric Vehicles in India: The Mediating Role of Attitude." *Vision*, vol. 24, no. 1, 2020, pp. 23-34.

Laghate, Gaurav. "Google, Amazon, YouTube Top India Brands." *Live Mint*, 2023.

Lee, Jung Eun, and Brandi Watkins. "YouTube Vloggers' Influence on Consumer Luxury Brand Perceptions and Intentions." *Journal of Business Research*, vol. 69, no. 12, 2016.

Lidhoo, Prerna. "Will cut in FAME-II subsidies for Electric Two-Wheelers Derail India's EV Growth Momentum?." *Business Today*, 2023.

Lim, Xin Jean, et al. "The Impact of Social Media Influencers on Purchase Intention and the Mediation Effect of Customer Attitude." *Asian Journal of Business Research*, vol. 7, no. 2, 2017, pp. 19-36.

Munaro, Ana Cristina, et al. "To Engage or not Engage? The Features of Video Content on YouTube Affecting Digital Consumer Engagement." *Journal of Consumer Behaviour*, vol. 20, no. 5, 2021.

Nandwani, Pansy, and Rupali Verma. "A Review on Sentiment Analysis and Emotion Detection from Text." *Social Network Analysis and Mining*, vol. 11, 2021.

Noel, Lance, et al. "Understanding the Socio-Technical Nexus of Nordic Electric Vehicle (EV) Barriers: A Qualitative Discussion of Range, Price, Charging and Knowledge." *Energy Policy*, vol. 138, 2020.

Parabhoi, Lambodara, and Payel Saha. "Sentiment Analysis of YouTube Comments on Koha Open Source Software." *International Journal of Library and Information Studies*, vol. 8, no. 4, 2018, pp. 96–102.

Prabowo, Rudy, and Mike Thelwall. "Sentiment Analysis: A Combined Approach." *Journal of Informetrics*, vol. 3, no. 2, 2009, pp. 143-57.

Press Trust of India. "EV Adoption Levels in India to See Exponential Growth: Report." *The Economic Times*, 2023.

Press Trust of India. "Sudden Reduction of Subsidy of Electric Two-Wheelers may lead to Major Decline in EV Adoption: SMEV." *Economic Times*, 2023.

Rajper, Sarmad Zaman, and Johan Albrecht. "Prospects of Electric Vehicles in the Developing Countries: A Literature Review." *Sustainability*, vol. 12, no. 5, 2020.

Sachdev, Alisha. "An Unanticipated Barrier Emerges in India's EV Adoption." *Live Mint*, 2023.

Shafiei, Ehsan, et al. "An Agent-based Modeling Approach to Predict the Evolution of Market Share of Electric Vehicles: A Case Study from Iceland." *Technological Forecasting and Social Change*, vol. 79, no. 9, 2012.

Sierzchula, William, et al. "The Influence of Financial Incentives and Other Socio-Economic Factors on Electric Vehicle Adoption." *Energy Policy*, vol. 68, 2014, pp. 183-94.

Sriram, K. V., et al. "Factors Influencing Adoption of Electric Vehicles - A Case in India." *Cogent Engineering*, vol. 9, no. 1, 2022.

Statista.com. "Most Popular Social Networks Worldwide as of January 2023, Ranked by Number of Monthly Active Users." *Statista.com*, 2023.

Thelwall, Mike, et al. "Commenting on YouTube Videos: From Guatemalan Rock to El Big Bang." *Journal of the American Society for Information Science and Technology*, vol. 63, no. 3, 2012, pp. 616-29.

Trivedi, Anjani. "The Giant Indian Auto Market is Short of EV Buyers. Here's Why." *The Economic Times*, 2023.

Wang, Junjie, et al. "Research on Carbon Emissions of Road Traffic in Chengdu City based on a LEAP Model." *Sustainability*, vol. 14, no. 9, 2022.

Wang, Ning, et al. "A Global Comparison and Assessment of Incentive Policy on Electric Vehicle Promotion." *Sustainable Cities and Society*, vol. 44, 2019, pp. 597-603.

Zee Media Bureau. "Tata Nexon EV Sales reach 50,000 Mark, Highest-Ever for Electric Car in India." *Zee News*, 2023.

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