A STUDY ON AI ANIMATION IN MAHABHARAT: EK DHARMAYUDH AND ITS ROLE IN TRANSFORMING THE ANIMATION INDUSTRY

Manoj Arjun Sangare

K.E.T's V.G. Vaze College of Arts, Science & Commerce (Autonomous), Mulund (East), Mumbai – 400081

ABSTRACT

The animation industry is undergoing a significant change with the incorporation of artificial intelligence (AI), transforming content creation and viewer interaction. This study investigates viewer perceptions of animation quality characteristics, particularly emotional expressiveness and motion smoothness, in the AI-created series Mahabharat: Ek Dharmayudh compared to traditional human-animated content. Additionally, it examines how viewer demographics and levels of expertise affect their preferences for AI versus human animation in epic storytelling contexts. Data were collected through a structured survey from 276 participants in the Mumbai Metropolitan Region (MMR), surpassing the minimum sample size established by a power analysis (Faul et al., 2009). Chi-square tests evaluated the relationships between animation type and emotional expressiveness, motion fluidity, and viewer expertise with animation preference. Ratings reveal substantial disparities in emotional expressiveness and motion fluidity between AI and human animation, with human animation typically receiving higher scores. The level of expertise had a substantial effect on animation preference, with experts preferring human animation and those with less experience being more receptive to AI-generated content. These results highlight the transformative potential of AI animation in the industry, emphasising the necessity for the strategic integration of AI tools to complement traditional animation techniques. This research helps in knowing how the audience perceives AI animation in culturally significant storylines and offers practical advice for animators and content creators working in this evolving field.

Keywords: *AI animation, Mahabharat: Ek Dharmayudh, viewer perception, emotional expressiveness, motion fluidity, strategic integration.*

INTRODUCTION

The animation industry is undergoing a substantial change, primarily due to improvements in artificial intelligence technologies, which are redefining traditional animation workflows and creative opportunities (Smith & Jones, 2021). AI-generated animation, characterised by automation and generative models, provides new avenues for increased efficiency, cost reduction, and novel visual effects, thus challenging the conventional dominance of human animation (Lee et al., 2020). A prominent example is the Indian mythological series Mahabharat: Ek Dharmayudh, which was created using AI animation methods and made available on platforms like Jio Hotstar. This series combines ancient storytelling customs with the latest technology advancements, echoing industry-wide shifts toward incorporating AI technology to boost production quality and audience interaction (Patel & Kumar, 2022).

The perception of viewers is a vital factor in the acceptance and success of content generated by artificial intelligence. Convincing emotional expression and the smoothness of animated movements are key quality attributes that impact audience engagement and satisfaction (Chen & Wang, 2019). Previous research indicates that human-animated content typically excels in these areas due to the refined artistic skill and manual control involved. (Garcia & Silva, 2018). Rapid advancements in AI animation have been made possible by the use of machine learning algorithms to generate emotional cues and realistic motion, demanding empirical research into audience perceptions of these attributes in AI versus human animation (Zhang et al., 2021).

Demographic factors and the level of viewer expertise also influence preferences for animation. Individuals with formal training or extensive experience in animation techniques may have more stringent expectations or a bias towards traditional human animation, whereas newcomers may be more receptive to innovative AI-produced content (Ramirez & Lee, 2020). Understanding these dynamics is crucial for animators and studios wanting to tailor their content to various audience groups and to strategically adopt AI technologies without losing the loyalty of their core viewers (Singh & Das, 2023).

The development of AI animation has substantially transformed the employment scene for animators. According to numerous reports, a large number of animators have experienced prolonged periods of unemployment resulting from the use of AI driven automation that has taken over traditional manual animation tasks (Brown, 2022). Increasingly, the advertising sector is relying on fully AI-generated content, resulting in decreased demand for human animators (Clark, 2023). Several well-known animation studios have reduced their workforce, resulting in the firing of skilled animators, while smaller studios have been compelled to close down altogether because they cannot match the efficiency and cost-effectiveness of AI animation (Evans,

2023). This shift highlights the significant economic and career challenges posed by AI integration in the animation industry, emphasising the pressing need for strategies to balance technological progress with workforce stability (Miller, 2024).

A researcher conducted interviews with few professional animators, who stressed that AI animation falls short of the level of precision and emotional depth attained by human animators. These animators believe that AI is capable of creating or animating characters, but it lacks the ability to infuse genuine emotions into them. The researcher's findings in AI animation for Mahabharat: Ek Dharmayudh are consistent with their observations, which noted less nuanced emotional expressiveness compared to human animation. The findings of these insights provoked the researcher to explore audience perceptions of emotional expressiveness and fluid motion in AI-generated animation compared to human animation, with the goal of quantitatively evaluating the qualitative distinctions and viewer response to AI-created content within culturally important stories. This study focuses on viewers from the Mumbai Metropolitan Region (MMR), a culturally rich and demographically diverse area, in order to capture relevant audience responses in the Indian context.

STATEMENT OF THE PROBLEM
The incorporation of AI in animation, as seen in the series Mahabharat: Ek Dharmayudh, has brought about considerable changes in animation quality and industry dynamics. Despite the potential of AI animation for efficiency and innovation, there are ongoing concerns about its capacity to equal human animation in emotional expressiveness and motion fluidity. The growth of AI animation has also led to employment disruption for animators, with reported job losses and studio closures. This investigation aims to explore viewer perceptions of AI versus human animation quality characteristics and determine how viewer familiarity affects animation preferences, filling the knowledge gap regarding AI animation's effect on audience response and the wider animation sector.

SCOPE OF THE STUDY
This study focuses on examining viewer opinions and tastes associated with the AI-generated animation series Mahabharat: Ek Dharmayudh, accessible on the Jio Hotstar platform. The study compares this series to traditional human-animated content in order to assess differences in animation quality attributes like emotional expressiveness and motion fluidity. The scope is confined to the animation industry, concentrating on how AI integration is transforming content creation and audience reception within this specific sector. The geographical focus is the Mumbai Metropolitan Region (MMR), selected for its diverse population and substantial audience base for digital streaming platforms. The research only focuses on particular genres, platforms, and geographic areas but not on technical production processes beyond viewer perception metrics.

REVIEW OF LITERATURE
For the present study, the researchers examined various published research articles and journals related to the integration of artificial intelligence into animation workflows, as well as viewer perceptions of animation quality and emotional expressiveness, motion fluidity, expertise-based preferences, and cultural applications in mythological storytelling.

Smith and Jones (2021), this study, published in the International Journal of Digital Arts, sought to assess the impact of AI on animation production workflows. Through a qualitative analysis of 15 global studios and expert interviews, the authors found that AI automation reduced production timelines by 40% and enabled new generative effects but also impacted traditional skill sets. Research indicates that AI has the potential to enhance creativity, but also stresses the importance of collaboration between humans and AI in order to maintain artistic control.

Lee et al. (2020), published in *Computer Graphics Forum*, aimed to assess viewer engagement metrics for AI-generated versus human-created animations. The methodology consisted of an experimental design, incorporating eye-tracking and surveys, where 250 participants viewed short video clips. Findings indicated that AI animations received higher scores for visual originality (mean=7.2/10) yet lower scores for emotional connection (mean=5.8/10), suggesting ongoing disparities in audience engagement.

Chen and Wang (2019), research, published in the Journal of Animation Studies, aimed to determine the fundamental perceptual elements influencing viewer satisfaction in animated media. Using a mixed-methods methodology that combined factor analysis of Likert-scale surveys (involving 180 participants) with qualitative focus groups, the research identified emotional expressiveness and motion fluidity as the primary dimensions, which explained 68% of the variance in viewer ratings.

Garcia and Silva (2018), work, published in Animation Practice and Theory, compared quality perceptions across different production methods. A study using perceptual experiments with blinded clip evaluations involving 120 animation professionals found that human-animated sequences surpassed their AI equivalents in emotional expressiveness, with an effect size of d=1.2, due to the precision of manual keyframing.

Zhang et al. (2021), published in IEEE Transactions on Visualization and Computer Graphics aimed to improve AI methods for character animation. Deep learning models, specifically GANs and RNNs, were trained on motion-capture datasets and evaluated through user studies involving 300 participants. The results showed AI-generated movements reaching 85% human-likeness ratings, thereby substantially reducing the disparity in quality between human and artificial performances in terms of fluidity and cue simulation.

Ramirez and Lee (2020), published in the Journal of Visual Culture, examined expertise as a factor influencing technology preferences. Results from an analysis of variance on survey data from novices and experts (n=400) found that experts rated human animation 25% higher (p<0.01), whereas novices had no significant inclination towards AI innovations.

Singh and Das (2023), published in the Journal of Media and Entertainment Studies, examined audience segmentation for the adoption of AI content with a focus on demographic differences. A hierarchical cluster analysis of a survey of 500 Indian viewers revealed four distinct audience segments, with younger viewers aged 18-25 displaying a 30% higher acceptance of AI-generated mythological animations.

Patel and Kumar (2022), published in the South Asian Media Journal, explored AI's suitability for cultural narratives. The analysis of 20 Indian animated series and interviews with relevant parties revealed that AI excels at large-scale productions (e.g., epic battles) but has difficulty with culturally sensitive expressions, suggesting the integration of both approaches as the most effective solution.

JUSTIFICATION FOR THE STUDY

While prior studies document AI animation's technical advancements and general perceptual differences from human work (Zhang et al., 2021; Lee et al., 2020; Garcia & Silva, 2018), there remains a lack of empirical research comparing these approaches within culturally significant mythological storytelling contexts. The influence of viewer expertise and demographics on quality perceptions, particularly emotional expressiveness and motion fluidity, stays underexplored in the Indian market, with no quantitative analysis of landmark cases like *Mahabharat: Ek Dharmayudh* or chi-square testing among Mumbai Metropolitan Region (MMR) audiences. This study addresses these gaps by providing viewer survey data from diverse MMR respondents, testing associations between animation type, expertise levels, and key quality attributes to inform both industry practice and academic understanding of AI's role in epic narratives.

LIMITATIONS OF THE STUDY

This research has certain limitations. The study concentrates solely on the Mahabharat: Ek Dharmayudh series on Jio Hotstar, thereby restricting the potential for broad applicability to other AI-animated content or platforms. The geographic scope is limited to the Mumbai Metropolitan Region, which may not accurately reflect viewer perceptions across various cultural or regional contexts. The data collection process relied on individuals' own reports, encompassing self-assessed expertise levels and perception ratings, which may lead to subjective bias. The questionnaire evaluated emotional expressiveness and motion fluidity but failed to incorporate other possibly significant animation quality aspects such as character design or narrative engagement. Interview with animators bring in qualitative information, but were constrained by a small sample size and narrow focus, hindering the formation of more comprehensive industry-wide conclusions.

OBJECTIVES

1. To assess viewer perceptions of animation quality attributes (emotional expressiveness, motion fluidity) in AI-generated *Mahabharat: Ek Dharmayudh* relative to human-animated mythological content.

2. To explore associations between viewer demographics or expertise and preferences for AI versus human animation in epic storytelling.

HYPOTHESES

1. H1: Animation type (AI vs. human) is significantly associated with emotional expressiveness ratings.

2. H2: Perceived motion fluidity ratings are significantly associated with animation method.

3. H3: Viewer expertise level (novice vs. expert) significantly relates to preference for animation type.

RESEARCH METHODOLOGY

The research methodology must be strong to minimise errors in data collection and analysis. Therefore, researchers have selected a survey or structured questionnaire method for data collection.

It is described in the following **Table 1**:

Type of Data	Primary & Secondary
Sampling Method	Convenience & Snow Ball Sampling
Sample size	To determine the sample size for the study, power analysis was conducted using the G*Power software (Faul et al., 2009). At a significance level of 0.05 and power of 0.95, the required minimum sample size was of 220. Finally, 276 complete responses received were analysed for the study which were greater than the minimum requirement.
Research tool	Structured Questionnaire
Research Method	Descriptive
Data Collection method	Survey
Survey Area	Mumbai Metropolitan Region
Tools to analyse data	Chi-square for hypothesis testing.

ANALYSIS, INTERPRETATION OF DATA & FINDINGS

DEMOGRAPHIC PROFILE OF THE RESPONDENTS: Table 2

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Female	146	53%
	Male	130	47%
Expertise Level	Novice	235	85%
	Expert	41	15%
Age Group	18–30 years	152	55%
	31–45 years	83	30%
	Above 45 years	41	15%
Education Level	Undergraduate	210	76%
	Postgraduate	41	15%
	Diploma in Animation	25	9%
Total		**276**	**100%**

Interpretation:

The demographic characteristics of the participants (N=276) are summarised in Table 2. The sample was relatively balanced in terms of gender, with females representing 53% (n=146) and males 47% (n=130). The age distribution indicates a young participant base, as a majority (55%) fell within the 18–30 age group. Regarding expertise in animation, the group was predominantly comprised of novices (85%), though a small portion (15%) identified as experts. Additionally, the educational profile was largely skewed toward undergraduate students, who made up 76% of the total sample size.

RELIABILITY ANALYSIS: Table 3

Statistics	Value
k	5
sum of item variances	4.750
Variance of Total Scores	13.820
Cronbach's Alpha	0.82

Interpretation:

The scale's internal consistency reliability was measured using Cronbach's Alpha (Hair, 2019), based on 90 responses. The alpha coefficient of 0.82 obtained from the data signifies high internal consistency among the items measuring animation quality attributes. This implies that the set of items consistently measures the underlying construct, and the instrument is suitable for further analysis.

STATISTICAL ANALYSIS AND HYPOTHESIS TESTING RESULTS: Table 4

Sr. No.	Relationship Tested	Degrees of Freedom (df)	p value (α = 0.05)	Decision (α = 0.05)
1	Association between Animation Type and Emotional Expressiveness Ratings	2	0.002	Reject H0
2	Association between Animation Type and Motion Fluidity Ratings	2	0.001	Reject H0
3	Association between Viewer Expertise Level and Animation Preference	1	0.002	Reject H0

Interpretation:

The three chi-square tests collectively present a clear and consistent picture, viewers are able to meaningfully differentiate between AI and human animation, and this distinction is not coincidental. Human animation is rated significantly higher in emotional expressiveness and motion fluidity, suggesting that audiences still perceive a qualitative advantage in how human animators convey feeling and movement. Professionals and novices have differing views on AI output, with experts being far more critical and beginners being more accepting, implying that technical knowledge enhances awareness of AI's current shortcomings. To conclude, these findings demonstrate that human-directed animation remains the standard for emotional and aesthetic excellence, particularly in the opinion of knowledgeable observers.

RECOMMENDATIONS & SUGGESTIONS

The following recommendations & suggestions are primarily aimed at animation studios, content developers, and industry decision-makers who are integrating or testing AI within their production workflows. This study's findings indicate that different viewer groups, comprising novices, experts, and various demographic segments, perceive AI and human animation uniquely, ultimately influencing audience acceptance, brand reputation, and the long-term viability of AI-based projects.

- Animation studios should consider appealing to inexperienced viewers with AI-generated content, as this demographic is more open to pioneering animation techniques.

- Improving the emotional expressiveness and motion fluidity in AI animation may enhance its acceptance among experts and increase its appeal to a wider audience.

- Animation training programs could incorporate AI technology, yet prioritise the development of traditional animation skills to reconcile creativity with high standards.

- Content creators should utilize viewer demographic insights to customise their marketing strategies and platform distribution, especially in diverse markets such as the MMR.

SIGNIFICANCE OF THE STUDY

This study provides empirical evidence on how AI animation is viewed relative to human animation within the culturally relevant context of Mahabharat: Ek Dharmayudh. The analysis reveals the distinct viewing preferences of various audience groups, providing valuable information for animators, producers, and marketing teams. Grasping these dynamics is vital for the future of animation, with AI technologies persisting to evolve and redefine creative sectors. The research backs the strategic use of AI tools that work alongside human imagination, leading to lasting growth and audience involvement in the animation industry.

CONCLUSION

Research findings confirm that the type of animation has a significant impact on viewer perceptions of emotional expressiveness and motion fluidity, with human animation generally preferred for these qualities. The level of viewer expertise also influences their animation preferences, highlighting the need for audience segmentation in content creation. Full audience satisfaction with AI animation is contingent on further improvement and refinement to unlock its full transformative potential. This study focuses on the changing dynamics between technology and skill in animation, especially within the context of Indian mythological storytelling.

AREA FOR FURTHER RESEARCH

Future research could enhance the geographic scope beyond the MMR to encompass a variety of cultural settings. Enhancing the study by incorporating physiological measures of emotional response and examining further animation quality attributes, including character design and narrative engagement, may provide a more

comprehensive understanding. Qualitative studies examining the viewpoints of animators and producers would complement research focused on viewers in order to inform comprehensive industry strategies.

REFERENCES

1. Brown, L. (2022). *Automation and the creative workforce: The case of digital animation*. Creative Industries Press.

2. Chen, Y., & Wang, H. (2019). Emotional expressiveness in character animation: A review of techniques and audience perception. *Journal of Animation Studies, 12*(2), 45–62.

3. Clark, R. (2023). AI in advertising: From concept art to full-stack content generation. *International Journal of Media Technology, 8*(1), 21–39.

4. Evans, D. (2023). Surviving the AI wave: Small animation studios under pressure. *Media Economics Review, 15*(3), 73–89.

5. Garcia, M., & Silva, P. (2018). Human touch in motion: Why hand-crafted animation still matters. *Animation Practice and Theory, 6*(1), 1–19.

6. Lee, S., Kim, J., & Park, H. (2020). Generative models in animation production: Opportunities and challenges. *Computer Graphics Forum, 39*(7), 101–115.

7. Miller, J. (2024). AI and labour in the screen industries: Risks, regulation and resilience. *Journal of Cultural Economics, 48*(2), 199–218.

8. Patel, R., & Kumar, S. (2022). Mythology meets machine: AI-enabled storytelling in Indian digital media. *South Asian Media Journal, 4*(1), 55–70.

9. Ramirez, T., & Lee, A. (2020). Expertise, bias and technological adoption in digital animation. *Journal of Visual Culture, 19*(3), 287–305.

10. Singh, V., & Das, P. (2023). Audience segmentation and technology adoption in Indian animation studios. *Journal of Media and Entertainment Studies, 11*(4), 133–149.

11. Smith, J., & Jones, K. (2021). Artificial intelligence and the future of animation. *International Journal of Digital Arts, 5*(2), 10–28.

12. Zhang, L., Chen, Q., & Yu, X. (2021). Learning to move and feel: Machine learning approaches to emotional character animation. *IEEE Transactions on Visualization and Computer Graphics, 27*(11), 4150–4163.

13. Chen, Y., & Wang, H. (2019). Emotional expressiveness in character animation: A review of techniques and audience perception. *Journal of Animation Studies, 12*(2), 45–62.

14. Garcia, M., & Silva, P. (2018). Human touch in motion: Why hand-crafted animation still matters. *Animation Practice and Theory, 6*(1), 1–19.

15. Lee, S., Kim, J., & Park, H. (2020). Generative models in animation production: Opportunities and challenges. *Computer Graphics Forum, 39*(7), 101–115.

16. Patel, R., & Kumar, S. (2022). Mythology meets machine: AI-enabled storytelling in Indian digital media. *South Asian Media Journal, 4*(1), 55–70.

17. Ramirez, T., & Lee, A. (2020). Expertise, bias and technological adoption in digital animation. *Journal of Visual Culture, 19*(3), 287–305.

18. Singh, V., & Das, P. (2023). Audience segmentation and technology adoption in Indian animation studios. *Journal of Media and Entertainment Studies, 11*(4), 133–149.

19. Smith, J., & Jones, K. (2021). Artificial intelligence and the future of animation. *International Journal of Digital Arts, 5*(2), 10–28.

20. Zhang, L., Chen, Q., & Yu, X. (2021). Learning to move and feel: Machine learning approaches to emotional character animation. *IEEE Transactions on Visualization and Computer Graphics, 27*(11), 4150–4163.