Shaping User Experience in Virtual Reality: A study with special reference to *Natyashastra*

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Abstract: This article presents a study regarding how *Natyashastra*'s fundamental principles of storytelling, emotional resonance, and cultural context structure the creation and reception of Virtual Reality (VR) content. Through an attentive examination of a specific VR activity featured in the Prime Minister Museum in Delhi—a helicopter ride showcasing India's modern infrastructure—the paper explains how *Natyashastra*'s influence infuses the narrative structure, emotional engagement strategies, and symbolic representations within the VR experience. By exploring the interaction between ancient cultural frameworks and cutting-edge technology, this research underlines the significance of integrating cultural heritage and traditional storytelling techniques into VR design to enhance user experience, emotional connection, and cultural resonance. Through this article, the importance of incorporating cultural frameworks like *Natyashastra* into VR design to improve user engagement and enrich the virtual experience has been highlighted.

Keywords: Bharata Muni, Museums, *Natyashastra*, Rasa theory, User experience, Virtual Reality (VR).

Introduction

This article presents a study regarding how *Natyashastra*'s fundamental principles of storytelling, emotional resonance, and cultural context structure the creation and reception of Virtual Reality (VR) content. It employs a qualitative research approach to explore the role of *Natyashastra* in shaping user experience in VR. Data collection involves observations of users interacting with the VR content at the Prime Minister Museum in Delhi, specifically focusing on the VR helicopter ride. Observations capture users' emotional responses, engagement levels, and perceptual experiences during the VR journey. Additionally, documentation analysis is conducted to examine existing literature, VR content scripts, and museum narratives to understand the guiding principles behind the VR experience.

The questions pertaining to this article include: What is the content, structure, and form of the storytelling used for the specific VR helicopter ride at the Prime Minister Museum? In what ways does it impact the user? What is *Natyashastra*'s role in analyzing and shaping user experience in virtual reality?

Natyashastra

The authorship of the *Natyashastra* is traditionally attributed to Bharata Muni. *Natyashastra* is regarded as the earliest comprehensive treatise on drama (Raghavan, 1991). This magnum opus of Bharata is held in high esteem within Hindu tradition, with its origins believed to be of "great antiquity, next only to that of the Vedas" (Adhikary, 2014, p. 36). The text encompasses drama, dance, music, and aesthetics principles, providing a thorough manual outlining techniques, emotions, stagecraft, and gestures (for an overview of the contents of *Natyashastra*, see: Adhikary, 2014, pp. 38-60).

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Bharatmuni's *Natyashastra* holds an important position within the Bharatavarishiya creative tradition, and is referred to as the fifth Veda. Several scholars and philosophers have broadly written on *Natyashastra*, including commentaries and literary texts. Abhinavagupta's commentary, *Abhinavabharati* stands out as a remarkable work in the aesthetics and literary theory. In this commentary, Abhinavagupta explores the complex elements of dramatic theory, exploring concepts such as rasa (aesthetic experience), bhava (emotional states), and the audience's role in experiencing the performance.

The concept of "Rasa," or aesthetic emotion, is a crucial concept in Sanskrit poetics and aesthetics. The theory of Rasa provides an integrating framework for all arts, offering a methodology for both the creation and analysis of art. Bharata identifies eight Rasas, including Shringara (Erotic), Hasya (Comic), Karuna (Pathetic), Raudra (Furious), Veera (Heroic), Bhayanaka (Horrifying), Vibhatsya (Disgusting), and Adbhuta (Wondrous) (for further discussion on the eight Rasa, see: Adhikary, 2014, pp. 254-264). These Rasas are not merely quantitative or qualitative but represent the varied hues of human experiences (Mathur, 2021).

Bharata's allocation of specific colors for each emotion reflects a profound understanding of psychological and physiological responses. The red color is capable of pumping up and stimulating the nervous system, it is accepted as a vibrant stimulant and Bharatha with great psychological insight has allotted it to a fiery dynamic emotion like ferocious or Raudra. The yellow color that can stimulate the nervous system and the intestines is associated with Adbhutha rasa. As black color causes both mental and physical depression, Bharatha has allotted it to Bhayanaka rasa. Gray regarded as a neutral color is the color of Karuna rasa. Green color which balances and soothes the body functions and stimulates the pituitary gland is the color of Shringara rasa and white is the color of joy. Orange heralded

as a social color, is cheerful and luminous, and vibrant is the color of Vira rasa. The blue color that is regarded as the color of extreme polarities is the color of Bibhatsa rasa (Cheriyan, 2017).

Natyashastra and Virtual Reality

Virtual Reality (VR) technology has transformed the way individuals communicate today with digital environments, offering mesmerizing experiences that engage multiple senses together. In the context of cultural heritage sites and museums, today, VR is an exclusive opportunity to transport users to distant locations and historical periods, fostering deeper engagement and understanding. This paper explores the elaborate relationship between *Natyashastra*, an ancient Sanskrit treatise on performing arts, and the shaping of user experiences within virtual reality environments.

VR technology has appeared as a powerful medium for creating fascinating digital experiences that transform traditional boundaries of space and time. By imitating environments and interactions in three-dimensional, computer-generated worlds, VR offers users the opportunity to analyze, learn, and employ in ways once impossible. Essential to the achievements of VR applications is the concept of user experience, which encompasses the overall impact and satisfaction individuals develop from interacting with VR content. While *Natyashastra* was originally proposed as a guide for theatrical performances, its principles resonate with contemporary media forms, including VR. The text offers valuable observations into the art of storytelling, emotional engagement, and audience participation—elements that are basic to creating compelling user experiences in the VR domain.

Museums are contributing significantly to bringing knowledge into the public domain. In case of India. Museum education has been a transformed space where storytelling is witnessing increased use of new media technologies to enhance

the learning experience of its visitors. India's cultural texts are no longer limited to the academic domain but have been brought into the public domain through impactful storytelling for the visitors to acquire knowledge about the processes and practices of India's philosophical traditions (Raj, Singh, 2021).

Literature Review

Adhikary's *Theory and practice of communication – Bharata Muni* (Adhikary, 2014), a notable contribution to the array of theories about communication, is distinguished by its cooperative effort to bridge the gap between theoretical constructs and practical application. In contrast to numerous academic treatises characterized by abstract discourse, it provides concrete examples and case studies that illustrate the relevance of theoretical concepts in everyday contexts. By interlinking communication with diverse disciplines such as psychology, sociology, and anthropology, Adhikary broadens the sources available to raise scholarly discussion. Consequently, Adhikary offers a more comprehensive understanding of communication processes within society. Specifically, he explains Bharat Muni's fundamental Rasa theory and theorizes a detailed explanation of the relevance of Rasas and bhava within the communicative environment.

Within the records of visual arts history, *Natyashastra* emerges prominently, explaining a color theory based on primary hues. This treatise underscores the profound significance of primary colors within Puranic cosmography, interpreting their associations with symbolism, their correlation with the four social classes, and their utilization in theatrical makeup. Kintaret describes the application of primary colors as articulated within *Natyashastra*, focusing on their communicative significance.

Contemporary branding strategies increasingly employ virtual reality (VR) solutions to provide users with captivating

experiences designed to articulate brand value and create emotional resonance. Scholarly investigations emphasize the pivotal role of emotions in shaping consumer decisions regarding product acceptance (Damasio, 1994). Imposing techniques such as gamification and storytelling, VR platforms make efforts to multiply user engagement. A rich tradition of literary analysis by scholars including Plato, Aristotle, and Bharatmuni provides foundational insights into narrative construction and its impact. *Natyashastra*, in particular, serves as a primary resource explaining the treatment of rasa (emotional response) and Bhava (imitations of emotions) within classical Sanskrit literature. Bharata presents eight emotional states and their corresponding Rasas (Barve, 2022).

The theoretical underpinnings of *Natyashastra* are relevant for informing the creation of engaging VR experiences. While Aristotle's Poetics emphasizes the centrality of actions in drama, Bharatmuni's *Natyashastra* is essential to the significance of incidents and situations. Barve argues that, during the dramatic engagement, the audience mentally projects emotions, culminating in the experiential realization of "Rasas," thus aligning with Bharatmuni's assertion that evoking these emotional responses constitutes the primary objective of dramatic performance.

The integration of technology with ancient concepts holds substantial importance across various domains. Wavre, Kuknor, and Patil (2024) consider that interdisciplinary research, involving contemporary technology alongside the Rasa Theory and the Raga Theory, offers valuable insights into human resource (HR) management processes, encompassing development, recruitment, motivation, and related areas. This amalgamation proves advantageous in understanding emotions and employee engagement growth, thereby facilitating the formulation and execution of effective HR strategies. Given the rapid adoption of virtual reality platforms and their crucial role in contemporary learning landscapes,

encouraging learner engagement emerges as a critical imperative. The absence of face-to-face interaction intrinsic in virtual reality environments underlines the necessity for deliberate design strategies by investing these platforms with mindfulness, intrigue, and goal-directedness. Notably, the construct of learning engagement incorporates cognitive, emotional, and behavioral dimensions related to the principles depicted in the *Natyashastra*'s concept of Rasa. This parallel deepens the role of learner reflection in conveying messages, thereby extracting alterations in audience affective states, behaviors, and cognitive processes.

Experiencing the VR at the Museum

The VR experience at the Prime Minister Museum in Delhi (link for The Prime Ministers' Museum and Library: http://pmml. nic.in/), presenting an imitated helicopter ride showcasing India's major milestones, provides a rich opportunity for examining the role of *Natyashastra* in shaping user experience in virtual reality (VR). It helps analyze how various elements of the VR experience, including visual and auditory cues, narrative structure, and emotional resonance, contribute to shaping the user's perception and engagement, including specific Rasas (emotions) that might be experienced (Barve, 2022).

Visual and Auditory Cues: The VR experience immerses users in a visually stunning story that manifests as a journey through India's marvelous achievements, such as the Dhola Sadiya Bridge and the Atal Tunnel. The scenic views and realistic landscapes evoke feelings of wonder (Adbhuta Rasa), as users are amazed at the brilliance and scale of these engineering marvels. The Adbhuta Rasa (marvelous or mysterious sentiment) arises from the Vismaya Bhava, a durable psychological state of astonishment (Adhikary, 2014). Additionally, the incorporation of sound effects, such as the helicopter's engine and ambient noise, adds a layer of realism to the experience, enhancing

the user's sense of presence and immersion. Scholars suggest that *Natyashastra*'s Rasas and Ragas can be utilized to identify learning engagement (Wavre, Kuknor, and Patil, 2024).

Narrative Structure: The VR experience follows a structured narrative arc, starting with a helicopter ride that adapts seamlessly into the exploration of India's accomplishments. The narrative is conducted by a scripted voiceover, which introduces each landmark and provides context for its importance. This organized storytelling approach helps orient users and guide their attention, ensuring a coherent and informative experience while provoking feelings of curiosity as users anticipate each new landmark. Narrative Structure in *Natyashastra* (Adhikary, 2014) describes a comprehensive framework for storytelling in performing arts. It discusses Natya (Drama): the plot should have a beginning (Prarambha), progression (Praytana), the possibility of attainment (Praptyasha), the certainty of attainment (Niyatapti), and attainment (Phalaprapti). This transition in the narrative is called Junctures (Sandhi). *Natyashastra* serves as a remarkable blueprint for storytelling that has stood the test of time. Its core principles of Rasa, Bhava, and Abhinaya continue to inspire artists and captivate audiences.

Emotional Resonance: The VR experience evokes a range of emotions in users, including excitement, awe, and pride. The simulated helicopter ride, with its realistic motion and extensive views, elicits a sense of adventure (Vira Rasa) and exhilaration. The Vira Rasa (Heroic Sentiment) arises from the Utsaha Bhava, the durable psychological state of enthusiasm or energy (Adhikary, 2014). As users explore each landmark, they may experience feelings of admiration, Vatsalya Rasa (the feeling of the parent towards the baby is Vatsalya. So, showing the affection and love that the parents enjoy towards the baby is Vatsalya) for India's achievements in infrastructure and engineering, as well as a sense of pride (Adbhuta rasa) in the nation's progress. Additionally, the narration emphasizes

the significance of these accomplishments, fostering a deeper emotional connection to the content.

Cultural Context: *Natyashastra*'s principles of storytelling, emotional resonance, and audience engagement are evident throughout the VR experience. The structured narrative, immersive visuals, and expressive soundscapes align with *Natyashastra*'s emphasis on captivating audiences and eliciting emotional responses. Furthermore, the VR experience serves as a modern interpretation of traditional storytelling techniques, leveraging technology to transport users to distant locations and evoke a range of Rasas, including wonder, curiosity, admiration, and pride.

In the VR experience at the Prime Minister Museum, a scene that evokes particular Rasas is the 360-degree view of the Atal Tunnel under the Rohtang Pass. As users virtually cross through the tunnel, they are enveloped in darkness before emerging into a breathtaking glimpse of the Himalayan landscape. This moment evokes the rasa of wonder (Adbhuta rasa) as users are captivated by the sheer scale and beauty of the natural surroundings. The contrast between the darkness of the tunnel and the radiant landscape outside, evokes a sense of awe and amazement, highlighting the remarkable engineering achievement of the tunnel and the natural magnificence of the Himalayas. This scene serves as an emotional reminder of human ingenuity and the awe-inspiring dignity of the natural world, leaving users with a profound sense of wonder and admiration.

In the preceding analysis, a visible dominance of a particular Rasa, namely Adbhuta, is observed. The Adbhuta Rasa, characterized by wonder as its predominant emotional state, is associated with specific elements within the narrative framework. The Vibhavas, or determinants, associated with this sentiment include the visual perception of earthly beings, the realization of long-held aspirations, and encounters with supernatural phenomena. Manifestations of this sentiment, known as Anubhavas, are portrayed through expressions

such as widened eyes, tears, perspiration, joyful exclamations, and graceful movements. Furthermore, the transient emotional states termed Vyabhicari Bhavas, linked with the Adbhuta Rasa encompasses reactions such as shedding tears, paralysis, choked voice, hair standing on end, heightened excitement, and even fainting spells (Cheriyan, 2015). Bharat Muni underlines the importance of addressing the values of sentiments and effectively engaging the audience. He maintains that a successful dramatic composition should predominantly evoke one primary Rasas while being complemented by a few others. It is only when the audience is engaged in the predominant emotional essence of the play, whether it be heroic, odious, or otherwise. The play can effectively convey its thematic message to the audience, while simultaneously encouraging an aesthetic appreciation. Nonetheless, for the principal sentiment to be deeply experienced by the audience, it must be supported by a "multiplicity of subsidiary and transient emotions" that are interrelated with other sentiments (Haliloglu, 2017).

Conclusion

The present paper examined the complex relationship between the user experience in virtual reality (VR) environments and *Natyashastra*, an ancient Sanskrit treatise on performing arts. Specifically, the VR helicopter ride displayed at the Prime Minister Museum in Delhi serves as an example of this relationship. The research explored how *Natyashastra*'s core concepts of emotional resonance, narrative structure, and cultural background impact the production and consumption of virtual reality material.

The study demonstrates various ways the principles of *Natyashastra* provide valuable insights into discerning several facets of the virtual reality experience. The paper also underlines the relevance of *Natyashastra* as a treatise on art, media, and mediated experience which helps analyze contemporary new media practices

employed in the museums. In keeping with *Natyashastra*'s emphasis on Adbhuta Rasa, users are immersed in a journey that elicits surprise and amazement through visual and audio signals within the VR world. Reminiscent of Vibhatsa Rasa, the structured narrative arc led by a prerecorded voiceover encourages user interaction and curiosity. Furthermore, the VR experience's emotional resonance—which evokes feelings of pride, enthusiasm, and admiration—reflects *Natyashastra*'s emphasis on invoking a variety of Rasas to fascinate audiences.

Importantly, the study underlines the necessity of integrating cultural heritage and conventional storytelling approaches into VR design to boost user engagement, emotional connection, and cultural resonance. By drawing upon concepts from *Natyashastra*, VR designers may create more appealing and immersive experiences that inspire a greater connection with the virtual environment.

The study has some limitations as well. Firstly, a single VR experience at the Prime Minister Museum in Delhi limits the generalizability of the findings to other VR applications or cultural contexts. Also, the methodology followed here is qualitative relying on observational analysis which may introduce subjectivity and lacks quantitative data to support the conclusions.

Based on the limitations, further studies can be done on a comparative analysis of *Natyashastra* with other aesthetic theories like Aristotle's Poetics. Empirical research can be applied to measure emotional impacts using biometric tools while cross-cultural studies can examine diverse user responses.

This study attempts to gain our knowledge of how traditional cultural frameworks like *Natyashastra* might influence modern technology like virtual reality, improving user experience and bridging the gap between innovation and tradition. As virtual reality (VR) emerges as a strong communication and educational tool, the tool if utilized in the larger frame of *Natyashastra*, has massive

potential to enhance the experience of the virtual environment and help produce significant and memorable digital experiences in museum education.

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