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ADAPTING STAGE PLAY TO VIRTUAL REALITY COMICS

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Abstract: *The digital revolution has given rise to hybrid mediums and a digital culture constructed through new communication technologies. This has created opportunities for sequential storytelling to expand from its conventional form towards immersive mediums. Comics, conventionally developed in codex book form, are currently experimenting with new media tools, where screens often replace pages. This phenomenon is considered the meta-panel, which has the flexibility to take any form, shape, or size. Virtual reality comics can immerse viewers in unique ways such as immersion in a 360-degree space, ambisonic sound, motion, and interaction with the content. Studies suggest that cinematic virtual reality and stage plays have several similarities, such as long takes, exaggeration in performance, and the viewers being located at a considerable distance from the performance. Therefore, designing for virtual reality can benefit from stage methods. This study experiments with the adaptation of theatrical storytelling into comics. This paper adopts a practice-based research method to develop a virtual reality comic, The Great Golden Gang. This paper includes a discussion on the design process for developing such a virtual reality comic. To test the engagement of the virtual reality comic, Chapter One was previewed by selected participants using head-mounted displays. A participant survey demonstrates the viewer's readiness for virtual reality comics and suggests the potential of hybrid mediums of a stage play, comics, and virtual reality. The Great Golden Gang is an example of the meta-panel and highlights the potential of virtual reality to contribute to new ways of experiencing the stage and comics.*

Keywords: *stay-play adaptation; virtual reality; immersive comics; visual narrative.*

Introduction

The digital revolution has provided a platform full of possibilities, such as augmented reality (AR), mixed reality (MR), and virtual reality (VR), which gives storytellers an infinite canvas to experiment with and explore its potential beyond one's imagination. The Virtual Reality Comics (VRC) titled: The Great Golden Gang is the result of one such experiment in VR undertaken by adopting practice-based research to explore the adaptation of stage play to virtual reality comics (VRC). This paper discusses the conceptualization and production processes followed to design the narrative experience in virtual reality.

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Whether it's a stage play, film, or graphic narrative, storytelling is a medium of communicating with its audience, Storytelling has been shaped by the effects of the dominant communication technologies of its age. As a reflection of this dominance, comic books have created opportunities for sequential storytelling to expand from its conventional form towards new immersive mediums.

This introduction of new technology has not only given rise to a new storytelling landscape but has also broadened the concept of co-authorship, thereby pushing the boundaries of sequential storytelling in an ever-evolving digital culture.

In the new technological collaboration, traditional elements such as sequential pictures and speech balloons featuring motion and interactivity are also integrated. For instance, in the experimental VR Comics (VRC) titled "The Great Golden Gang," these components were realized through the use of minimal animation for transitions. This approach involved displaying close-up shots following a pan view, accompanied by speech bubbles presented one after the other to advance the narration.

Comic books which were conventionally developed in codex book form are now open to being reinvented with new media tools. The codex book form brings a new formula: "Print, though, presented a landscape of tiny cul-de-sacs, asking readers to leap to new paths every few panels based on a complex protocol" (McCloud, 2000, 220).

In contrast to the fixed pages of a traditional codex book, a computer monitor serves as a dynamic window, offering an expansive canvas, as articulated by McCloud (2000, 222). McCloud also delves into the concept of interactivity within digital comics, highlighting the myriad possibilities for engagement with sequential art in a digital context, whether it involves choosing a narrative path, uncovering hidden content, or zooming in on specific details (2000, 229). This shift from physical pages to screens ushers in a novel notion of the meta-panel, as elucidated by Will Eisner

The meta-panel can take the form of various sizes and layouts within a single scene. (Eisner, 1990), This was achieved in VR Comics (VRC) The Great Golden Gang, using small frames for close-up shots along with pan shots in the backgrounds all in a single scene.

Comics have existed inside the shell of print for hundreds of years, now shifting from print to new digital formats such as motion comics, interactive comics, hyper-comics, comic-based games, webcomics, and even virtual reality. This study explores the potential of comics adapted from stage play to virtual reality. To understand more about the established media of stage play and comics, this study examines the advantages and limitations of each medium.

Pros and Cons of Stage Play and Comics

The purpose of any medium of communication is to convey ideas, regardless of their apparent differences. Whether it is a memory, a philosophy, or a story, the goal is to transmit concepts. In the world of art, the unique methods that are selected to convey concepts contribute to its overall retention. Stage play and comics are both mediums of communication that have their strengths and weaknesses.

The key difference between comics and stage plays as communication mediums lies in their composition. Comics are

composed of hand-drawn or digital drawings, while later ones consist of real-life objects and human beings. Though both are capable of storytelling, their methods of presentation vary. Comics convey stories through sequential panels, allowing for the simultaneous depiction of multiple actions in different locations. This juxtaposition of panels can connect stories in a way that is unique to comics For example, "Scott Pilgrim vs. The World" (2020) started as a comic book series before becoming a movie. The film used comic book techniques, like showing three-way panels, to display the relationships between the main characters all at once. Performing this narrative in a stage play would offer its challenges.

Stage plays and comics employ vastly different storytelling tools. A stage play can depict various scenes, even in different locations, all within a single stage observed by the viewer from a distance, demanding considerable imagination from the viewer. In contrast, Comics can convey motion with simplicity by adding extra lines, exaggerating expressions, and having the flexibility to utilize various angles and close-up views, which makes comics a potent medium when compared to stage plays, which are often constrained to single-angle perspective. (Celebi, Y. 2015, July 6).

Chang (2016) mentions that stage plays use a variety of acting and lighting techniques to guide where the viewer should look, and incorporate open body position and gesture more with dynamic horizontal and vertical character movements. Furthermore, similar to stage plays, the use of exaggerated character gestures, expressions, and effective line strokes in graphic narratives helps to guide readers' attention to where and what they should observe.

Taking into account these differences and advantages, adapting stage plays into graphic narratives could bring to light new aspects of the story, such as expressions and thrilling moments. It offers the potential to add more details to the story that might have been missed or not highlighted during a live stage performance. For these reasons, the interplay between the stage and the graphic narrative is intriguing, offering numerous creative possibilities and exciting interpretations. As both mediums evolve and push boundaries, the future of storytelling offers new ways to experience a variety of possibilities. When venturing into Virtual Reality Comics (VRC), it is crucial to have a solid understanding of cinematic techniques, and storytelling is essential for creating compelling virtual reality comics. The following section examines the possibilities of comics in cinematic virtual reality.

The Potential of Comics in Cinematic Virtual Reality

When creating a Virtual Reality Comic (VRC), it's essential to grasp the techniques and limitations involved in producing a 360-degree film. VRC combines the features and methods of Cinematic VR, presenting a more immersive and interactive experience to its viewers. To explore effective storytelling in Cinematic VR, it's important not to overlook traditional storytelling mediums like film and stage plays, as the transfer of skills from these mediums is evident in the early attempts at VR storytelling.

From a comic artist's perspective, the infinite canvas of the digital medium offers liberation. This stands in contrast to the constraints of printed comics, which limit viewer-driven engagement compared to recent digital platforms. The actor's body language, such as an

open body position, prolonged orientation towards the viewer, and exaggerated body movements and gestures, become critical components that are also incorporated in Cinematic VR, just as they are in traditional stage play practice. In contrast, a 360-degree virtual reality video allows the viewer to look wherever and at anything they like, whenever they like, further enhancing their sense of immersion.

Virtual reality (VR) is distinct from traditional cinema since the user watches 360-degree video while wearing a headset. The viewer is no longer a passive observer, staring at a two-dimensional screen; instead, they are fully immersed in the action. This means the spectator assumes the role of narrator and actively participates in the story by selecting the focus of their attention. This way of perceiving stories differs from the authoritarian approach of traditional filmmaking.

Perspective is one aspect that drastically shifts when moving from a 2D video to an immersive medium. Instead of looking at a flat, rectangular screen, the spectator in an immersive media becomes part of the action. Virtual reality puts the viewer in charge of the narrative, giving them control over what they see and how they interpret it. It's a big change in how viewers participate in stories, from being on the sidelines to being integral parts of the action. Wooksang (2016) suggests that cinematic virtual reality and stage plays have a few similarities such as long takes and exaggerated acting. Therefore, designing for virtual reality can benefit from stage methods. Table 1. summarizes the similarities and differences between stage play, comics, and VR comics.

Table 1. Similarities in the mediums that are helpful while creating VR Comic

	Stage play	**Comics**	**VR Comic**
Acting / Staging	Exaggerated and dramatic	Exaggerated and dramatic strokes	Exaggerated and dramatic strokes
Visual compositions	More actions than face	Both Face and gestures	Both Face and gestures
User	Set distance as a viewer	Set distance as a reader	Immersed in Scene
Space size	limited	Limited frame structure	Unlimited
Angle Variation	No (one position)	Different perspectives and angle	Different perspectives and angles,

Considering all these advantages and limitations, these mediums have raised the question:

1. What factors should be considered in adapting a stage play to a VR Comic?

2. What is the viewer experience of the VR comic, The Great Golden Gang?

Methodology

Comics, a form of sequential art, narrates stories through multiple panels. While creating a traditional comic it contains elements like symbols, frames, panels, and icons. These frames can be presented as a single entity or a sequence of interconnected frames, weaving a narrative. When these components come together, they shape a visual narrative where the whole defines its appearance. Therefore, when crafting a virtual reality comic, it's essential to incorporate these elements in a manner that remains familiar to the reader to avoid any confusion with virtual reality comics or animated films.

A practice-based research method that emphasizes the creation of tangible artifacts as a means of inquiry was adopted to create virtual reality comics as part of the experiment to adapt theatrical storytelling into a comic. This research method allows us to explore and address questions through the process of making, doing, or creating, with the resulting artistic work serving as a central component of the research output.

This approach recognizes that the act of creating something can be a valuable form of research, providing insights, knowledge, and understanding that may not be as effectively conveyed through traditional academic writing. An old Marathi play titled The Great Golden Gang, written by the renowned Marathi playwright Ratnakar Matkari, was selected for this experimental VRC. This play was selected based on suspense in the narrative and the vibrant settings which were suitable for exploring immersion in VR comics.

Discussion

Adapting The Great Golden Gang into a VR Comic

The plot of the play revolves around two teenage brothers named Vikram and Raman, as well as their orphaned friend Sudkya. They refer to themselves as the leaders of their three-member gang, known as The Great Golden Gang. Their first team mission leads them to visit their village graveyard, where they witness something that forever changes their lives.

Initially, all the main characters in the story were designed, and accordingly, character sheets were prepared. For drafting the virtual comic, an equirectangular projection grid was used. In addition to the illustration sketching skills, significant emphasis was given to the imaginative part while drafting the perspective. This included determining where the characters would be placed, at what distance, and their positions, considering the horizon and the location of vanishing points on the left and right sides of the 360-degree environment.

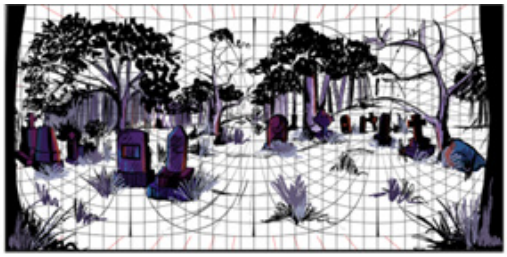

Figure 1. Sketch in Equirectangular Projection Grid (Source: Research Documentation)

Figure 2. Equirectangular projection grid, adapted for the VR Comic "The Great Golden Gang." (Source: Research Documentation)

The traditional method of producing comics has been through print, which is immobile. They imply movement with things like motion lines. Therefore, in the case of VRC, the medium is very interactive and can use animation and sound effects while creating new forms of sequential storytelling.

Comic-like animation in VRC is not achieved by the use of animation loops. Instead, this kind of animation contributes to established comic book standards by emphasizing the importance of the moving line. The story stays as true to the comic book medium as feasible through

the use of still images and speech balloons to move the plot using animation to produce smooth transitions between frames. Instead of using movement to get the point through, the focus is on static images with explanatory text in speech bubbles. To ensure the user has a seamless experience exploring the conversations taking place in the 360-degree environment, we took into account the codex book format while positioning the speech bubbles.

When creating scenes for a 360-degree viewing experience, it is vital to consider that the viewer can move 360 degrees around the room simply by moving their head or body and also the amount of time viewers might spend in various areas of the space. It's important to note that not all directions around the viewer carry equal importance. This 360-degree space can be divided into three main parts based on the viewer's position, as depicted in Fig. 3: the primary front area, the rear area (typically situated on the extreme right and left sides of the viewer), and the blind spot (mostly located at the back of the viewer).

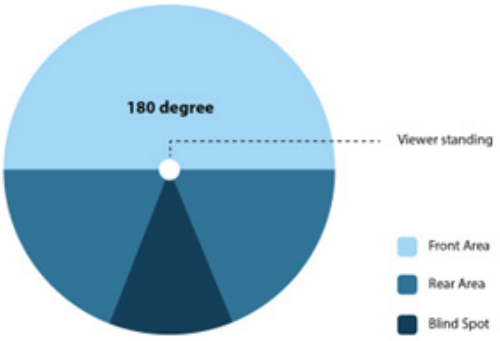

Figure 3. Area division based on time spent by the viewer in 360-degree space.
(Source: Research Documentation)

Viewers tend to concentrate more on what was within the front zone, the 180-degree area in front of them, and were less likely to pay attention to objects or details in the rear zone, which required them to turn their heads significantly. The blind spot was where viewers were most likely to overlook or miss important elements, even if they were relevant to the narrative. To mitigate effective staging and directing cues, this can also be employed to encourage viewers to explore the rear zone, but it is still preferable to place all essential elements in the front zone. Consequently, while crafting this VR comic all character movements were positioned within the 180-degree frontal area. Speech bubbles and close-up, medium, and full-pan frames with exaggerated expressions and gestures, were also strategically placed in the front area as the viewer in VR Comics has the unique ability to traverse the Z-axis close-up frames (Fig. 4) ensuring that viewers are immersed in the virtual space did not miss any important events. This dynamic exploration is entirely under the control of the viewer, with no input from the creator.

Figure 4. A Headset View Scene
(Source: Research Documentation)

One of the biggest problems with 360-degree video is that viewers could be too enamored with the environment to pay attention to the plot, leading to FOMO (fear of missing out) and a lack of investment in the tale as a result. Design features like brush strokes, colors, and lighting can be especially useful in virtual reality comics.

Figure 5. Utilizing light and contrast to direct the user's attention towards the scene. (Source: Research Documentation)

Lighting draws the eye with contrasting levels of illumination. Furthermore, the hue and intensity of lighting fixtures improve one's disposition. This method of directing the viewer's gaze initially made its way from real-world theatres to computer-generated settings. Directing the reader's attention in virtual reality comics is made easier with the use of lighting, blackout, or color effects.

One of the primary benefits of creating virtual reality comics is the incorporation of sound effects and narration into graphical storytelling. The addition of background music and narration enhances the viewer's immersive experience, similar to that of watching a film or a stage play, which would not have been possible in traditional printed comic books.

Sound in VR can not only enhance the viewing experience but also aid in navigation. The viewer can identify the source of the sounds and direct their attention to them. In VR, narration or voice-over can help the viewer naturally understand the entire story even if they are looking elsewhere.

With all of these considerations in mind, the final draft of The Great Golden Gang, Chapter One, was prepared with text bubbles, various frames, sound effects, and voice-overs, ready to test the effectiveness of this experimental design. In addition, as is typical while watching 360-degree videos, test viewers sat down. We found that seated audiences paid the most attention to the front, which is where the focus should have been all along. They were also less curious than usual.

In this configuration, the spectator watches a 360-degree film while seated in a swivel chair and outfitted with a virtual reality headset. The spectator can spin across 360 degrees by turning both the chair and their entire body. It provides greater ease and comfort than simply turning their neck. The swivel chair indicates the possibility of rotation and serves as a pivot point for smoother rotation. When compared to standing and viewing, the swivel chair method improves overall comfort and safety.

Observation

To improve comprehension and guarantee the achievement of accurate results, the success of this project is dependent on external observations and constructive input from third parties. Participants used VR headsets to see 360-degree video excerpts of an experimental stage performance based on the VR comic The Great Golden Gang, Chapter One.

Changing the perspective of the audience from passive observers to active participants and from standard screen-based media to immersive media necessitates allowing the audience to decide for themselves what they want to see. The primary goal of this research is to examine how well people respond to virtual reality comics to determine the viability of combining them with live theatre and computer-generated imagery.

Subjective evaluations looked at how involved people were with the material,

how much fun they had, and how well the interface worked. 20 participants volunteered for the face-to-face interviews in a comfortable environment (8 females, 12 males) at the Indian Institute of Technology, Hyderabad. These participants had areas of interest in visual design (like illustration, comics, animation, and painting) and performing arts (like dance and drama). They ranged in age from 19 to 26. They claimed varying degrees of familiarity with virtual reality and 360-degree video. Nine of the twenty participants had either never used VR or had only done so a handful of times in the previous 12 months, while one reported using VR daily for schoolwork. Ten out of twenty claimed to have never experienced a 360-degree video. 14 out of 20 participants mentioned their interest in comics as readers, like manga, Detective Comics, Marvel, and some Indian comics like Chacha Chaudhary, Champak, Chintu, and Tinkle comics. 4 participants had never read comic books but had only been exposed to printed comic strips in newspapers like Henry, Calvin, and Hobbies, and 2 participants reported being active comic content creators.

During the experiment, individual participants viewed the 360-degree videos wearing an Irusu VR Plus Headset with Headphones, a 40-mm High Definition lens for mobiles with an interpupillary distance (IPD) adjustment, Built-In adjustable headphones with a connector, an adjustable headband, and a touch button, ensuring smooth playback of 4K videos for experiencing the immersive world. When the participants finished watching the experience, they were requested to remove the head-mounted device and participate in a semi-structured interview using the following prompts:

1. Can you provide an objective overview of the entire experience?

2. What specific aspect of the video left the strongest impression on you?

3. In your opinion, which medium—a VR headset or a regular TV—is more suitable for experiencing this type of content in the future?

4. Are there any additional observations or insights you would like to share?

The interview revealed that seven viewers out of a total of twenty focused primarily on either the experience, the content, or the technology. While the remaining 13 said things like, “It feels like a 360-degree experience, an immersive tour…I can look around,” they were more interested in the user experience and novelty of the 360-degree comic than the video’s actual content. One participant said, “I feel as if I was transported to the space of a comic and being there with the character in the graveyard.” This immersive quality is highly favored by participants. I’d rather employ it.

The VR technology itself was a topic of discussion among the participants. They discussed how the headset is easy to use, comfortable, and blocks off the user’s surroundings to provide a more immersive experience, something that is not feasible when reading a comic book or seeing a stage play. A small number of participants provided constructive criticism by outlining what they would like to see changed in the final product: “I do not want to use the VR headset frequently…not for a long period due to the motion sickness factor.”

Many viewers shared sentiments like, “I felt like the adaptation of the stage play in a comic that too in VR is very interesting,” highlighting the importance they placed on the video’s central messages. The utilization of frames was one aspect

of the video that one viewer found very intriguing. Someone who took part in the discussion remarked, "The use of frames to highlight specific elements as used in comics is quite impressive because I think it is interesting and cool to see this hybrid."

Some of the participants didn't provide details about the system, but rather their general impressions, such as how the viewer is completely involved in the virtual scenario and can freely look around or select the next episode to watch. They cited this as a benefit over other mediums (theatre, movies, and comic books): "I felt I was in the graveyard and lakeside all the time, and I did not get distracted by other things...Seeing myself actually standing in the graveyard is better than seeing it through a screen or as a video."

One of the common feedback items received by all the participants was for the background music and audio dialogue narration added, which contributed tremendously to enhancing the overall experience. This is one of the advantages of this medium, as even if the viewers are distracted while looking at the 360-degree immersive environment, they won't miss any important dialogues and will be connected to the plot of the graphic narrative

It was observed that due to the shift of the comic experience from a traditional print medium to an immersive 360-degree environment (VR), the viewer's natural tendency to explore and incentives to invoke exploratory behaviors were also noticed. The viewer's tendency to actively explore an immersive environment can be mediated, demonstrating the viewer's readiness for virtual reality comics, thereby suggesting the potential of hybrid mediums of stage play, comics, and virtual reality. Therefore, the participants' results were effective as the narrative was able to transport the viewer into the story itself, bringing it to life in a different manner than traditional stage play.

Conclusion

The digital revolution has unleashed a realm of limitless possibilities, epitomized by the exploration of virtual reality (VR) comics in The Great Golden Gang. This transformative era not only redefines the storytelling landscape but extends the boundaries of sequential narratives in the ever-evolving digital culture. The fusion of traditional elements with digitalization has given rise to new storytelling mediums, offering dynamic canvases for creators to navigate. From the metamorphosis of comic books in codex form to dynamic screens and the concept of the meta-panel, the journey from print to digital has opened doors to interactivity and multimedia, enriching the narrative experience. As comics continue to evolve and adapt to the digital age, the integration of VR, motion, and interactivity marks a significant leap forward, promising exciting possibilities for storytelling in the immersive realm.

The essence of communication lies in the transmission of ideas, regardless of the medium chosen. Stage plays and comics, while distinct in their composition and presentation, each bring their unique strengths to storytelling. Comics, with their sequential panels and flexibility, excel in conveying complex narratives and emotions, while stage plays leverage acting techniques, lighting, and sound to guide the viewer's focus within a single stage. The convergence of these mediums holds the potential to unearth new dimensions of storytelling, unveiling hidden facets of stories and captivating viewers in innovative ways. As narratives venture

into the realm of Virtual Reality Comics (VRC), understanding the nuances of cinematic techniques becomes paramount, ensuring the creation of immersive and compelling narrative experiences. The interplay between these evolving mediums promises exciting possibilities and interpretations for the future of storytelling.

VRC combines elements of Cinematic VR to offer a highly immersive and interactive storytelling experience. This shift from traditional media to VR brings a significant change in perspective, where the viewer becomes the narrator, freely choosing what to focus on and engage within the virtual environment. Unlike conventional cinema, VR empowers the viewer with a more active role in the storytelling process, fundamentally altering the dynamics of narrative engagement. Additionally, insights from traditional mediums like stage plays and film prove valuable in crafting compelling VR narratives, as they share common elements such as long takes and exaggerated acting, providing a bridge between the traditional and immersive storytelling worlds.

This first research question aimed to understand the factors considered for adapting a stage play to a VR comic. To address this question, the study adopted practice-based research to create a VR comic, The Great Golden Gang. The fusion of traditional comic elements, such as symbols, frames, and panels, with the immersive capabilities of VR, required careful planning to maintain reader familiarity and prevent confusion.

Furthermore, the unique potential of VR comics was harnessed, by incorporating animation, sound effects, and narration to enhance the immersive experience, thus expanding the storytelling possibilities beyond traditional printed comics. To guide viewer attention in the expansive VR environment, techniques like lighting control and contrast were borrowed from theater stages, while strategically placed sound cues and narration helped maintain narrative comprehension.

The second research question aimed to validate the effectiveness of The Great Golden Gang, Chapter One, in selected participants. Participants confirmed that the adaption of the stage play in a VR Comic was achieved successfully and appreciated the freedom it gave to explore the 360-degree environment. They emphasized the value of background music and audio narration in enhancing the overall experience. This experience demonstrated the readiness of viewers for virtual reality comics, affirming the potential of blending elements from stage plays, comics, and virtual reality to create engaging and captivating narratives that transcend traditional storytelling boundaries.

This project explores the convergence of stage play, comics, and virtual reality (VR) to create an immersive narrative experience, showcases a strong preference for the immersive nature of VR, and highlights its ability to transport viewers into the story's world. The Great Golden Gang is an example of the meta-panel that transits from traditional print mediums to immersive VR. In conclusion, comics have evolved tremendously with the advent of virtual reality and digital technologies, offering boundless creative possibilities in both 2D and 3D formats. This rapidly advancing field presents endless potential for storytellers and creators. This digital revolution has ushered in a new era of hybrid media, shaping new ways to communicate and tell stories. The diversity and creativity of these evolving mediums offer fresh avenues for self-expression and storytelling.

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