Identifying the Developmental Challenges of Creating Virtual Reality Theatre

This paper reports on the identified challenges of creating virtual reality theatre from the practitioner's perspective.

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ABSTRACT

Virtual Reality Theatre continues to grow as a form of digital creative output for theatre practitioners. However, understanding the common challenges faced during the development of productions by practitioners and the barriers to entry produced by the complexity of platforms is under-researched. This paper provides an in-depth analysis of several challenges identified through semi-structured interviews of practitioners and a thematic review.

CCS CONCEPTS

• **: Human-centered computing** → Human computer interaction (HCI); Interaction paradigms; Virtual reality.

KEYWORDS

Virtual Reality, Theatre, Practitioners, Challenges

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1 INTRODUCTION

Theatre productions are a relatively new creative output within the Virtual Reality (VR) medium, however, the development process comes with its own set of challenges. With the arrival of modern VR devices, the medium has become a place of immersive experimentation for the creative industries [1], [3] which has led to its uses for theatre productions [7], [9]. While experimentation uncovers VR's limitless creative possibilities it also highlights the challenges faced by novel productions. Such challenges are being faced across productions, from the audience to producers, each with issues directly related to how their roles fit within and work with the medium. Although a handful of perspectives have been well researched, such as the perspective of the audience [12], [4], [8], there is little academic research on the practitioner's perspective and the challenges they face when creating VR theatre. To address these issues and highlight existing challenges VR theatre practitioners were interviewed after which the transcripts were thematical analysed. Overall, 10 practitioners who had experience in both traditional (non-VR based) and VR theatre were interviewed through a semi-structured interview process. The presented research provides a detailed overview of the challenges currently being faced by practitioners within the VR theatre space and highlights specific areas for further research and development to create foundational solutions to improve the future use of VR as a medium for theatre productions.

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2 METHOD

For this study, detailed data on the challenges faced by VR Theatre practitioners was required. This data is key to providing firsthand information on where the challengers being faced lie. To gather in-depth data for this study and highlight particular areas of friction between the medium and the practitioner a qualitative semi-structured interview approach was adopted. Once collected the data was analyzed through a thematic analysis to uncover themes and highlight patterns.

2.1 Participant Recruitment

VR Theatre covers a large area and often encompasses live action-based performances which are presented to the audience through immersive technology. However, this study's focus is on the challenges encountered by theatre practitioners when swapping the physical stage for VR and the challenges faced with the new medium. Therefore this study excludes live theatre productions and films recorded using 360° cameras. To select Interviewees a list of published high and low budget VR Theatre Productions was created. From this list, individuals who had been involved in the creative process for creating the products were contacted via email, LinkedIn and Discord. To further ensure that relevant data was collected a condition was added to the selection process, practitioners must have experience in creating both traditional and virtual theatre productions. This condition was included to enable practitioners to reflect on how the emerging challenges of VR theatre may have been overcome in traditional theatre. All participants were recruited directly by the researcher and after 10 participants were interviewed further recruitment was stopped due to the high quality and detailed data collected.

2.2 Data Collection

A total of 10 participants were recruited and interviewed between February 2022 to May 2022. On average each interview lasted 30 minutes and approximately 45,000 words of data were collected. All interviews were held remotely using online video conferencing software. To conduct the interviews the researcher developed a list of open-ended questions, the selected questions were chosen based on a preliminary study which highlighted the challenges faced when observing VR Theatre productions. As the interviews were semi-structured the list of question were used as a guide to keep the interviews on topic. The researcher decided not to reveal the interview questions to the participants before the interview, this decision was made to encourage the practitioners to highlight the emerging and apparent challenges that they had faced during production with the aim of making it clear what the immediate challenges currently are.

The semi-structured interviews began with an overview of the research project followed by confirmation from the participant that the consent form had been completed and agreement to have both their audio and video recorded. The interviews then continue with open questions about the participant's views and opinions on VR and the challenges of creating theatre within the medium. Following this, open questions with a direct focus were asked. This encouraged the participants to express their experience with particular areas of theatre, including scene transitions and onboarding. Overall, the questions were used as a prompt to enable the participants to speak freely about the challenges faced and to highlight possible areas of friction.

2.3 Data Analysis

After completing the interviews each audio recordings were transcribed using Dovetail [2] and edited for accuracy by the researcher. The transcribed data was then input into NVivo [5], a qualitative data analysis software, for coding and theme development. To analyze the data this study adopted Braun and Clarke's reflective thematic analysis method [11]. Braun and Clarke's method is commonly used to build and identify meaningful themes through the development of patterns within a collection of qualitative data. This method aligns well with the qualitative data produced for this study through the semi-structured interviews, described above, as the collected data contains emergent patterns which highlighted the similarities within the challenges being faced by the participant. To begin the analysis the researcher familiarized themselves with the data by re-reading the interview transcripts multiple times, as outlined in the Braun and Clarke method [11], to develop a deeper understanding of the data. Next NVivo's inbuilt coding tools were utilized to highlight codes and build patterns within the data. Overall, 42 individual codes, with 603 references to the data, were identified with emergent patterns around challenges and areas of creative friction within VR theatre. After the entire dataset had been coded, each code was revisited and reviewed to develop relationships between them and highlighted patterns as well as possible themes.

From the collected and analyzed data six themes were developed (Confusion about the abilities of VR and the restrictions of development platforms, Unexpected Frictions Created by the Audience, Transitions are undervalued, underused and underappreciated, Onboarding is a Painful Experience, Framing and Directing the Users Attention often is Difficult and The Frustrating Costs of Bespoke Productions) all of which yield details and interesting data around the challenges faced when creating VR Theatre productions.

3 RESULTS

Six themes were developed through a thematic analysis of interviews with theatre practitioners, two of the more prominent themes have been chosen for analysis in this paper. The themes presented provide an in-depth look at the challenges currently being faced within the VR Theatre space from the perspective of the practitioners. The following section breaks down the themes and highlights the current areas of friction to provide VR developers with a foundation of challenges to overcome to continue to improve the usability of the medium for creators.

3.1 The abilities of VR and the restrictions of platforms

One of the overarching barriers to entry the participants highlighted during the interview phase covered how the limitations of the medium introduce another level of challenge to using Virtual Reality. These limitations cause issues due to being unexpected and impassable leading to compromises in creativity:

> "The biggest drawback for virtual reality, the technical state it's in, is the avatar because they're so inflexible"

Fundamental miscommunication has led to a misunderstanding of what is possible within the VR space when developing VR theatre productions. While there are apparent and complex challenges with VR as a medium which have caused creative barriers to be erected "We know that with current VR technology, we really have to be cognizant of fatigue and of, you know, VR sickness and things like that. And we really just have to have to limit the duration of the pieces" the majority of challenges faced by practitioners are occurring due to their choice of platform. In this instance, a platform is the framework that productions can be built upon and often contain a set of tools to allow for interactions to be developed. The use of these platforms has led to several self-imposed challenges which could be overcome with the use of different platforms or bespoke solutions:

> "I wanted to have the lighting fade out at the end of the show, I felt, really felt like that was a really important effect. And I couldn't do it with lighting. So I have to basically ma you know, create a semi-transparent texture with a gradient. So it was like lowering a scrim in front of the audience that had a gradient."

It is clear from the dataset that the blending of challenges between the medium and the platforms is a communication issue between practitioners and developer/platform providers rather than an inherent misunderstanding of the technology. From the interviews conducted for this study, the responses from participants around the origin of challenges varied. In circumstances where the participants had worked with a large production company or had a hands-on/multi-role position in the creation of a production, for example taking on the roles of both director and lighting designer, the

participant's understanding of the difference between the medium and the platform was more defined:

> "The sort of animation library that most platforms have is extraordinarily limited" Onboarding is a Painful Experience

Onboarding is a crucial step to helping both actors and audience members alike in orienting themselves within the virtual space, however, the experience is not always smooth and it can be challenging to determine the right way to Onboard both new and veteran users of VR technology:

> "That's where the technology gets in the way, because, you know, because it's so new and it's so finicky and flaky, right. And there are so many steps just to get all the participants into the space."

Onboarding, similar to tutorials in video games, is the process of inducting a user to the mechanics of a new environment; this often includes familiarising them with locomotion controls, possible ways to interact with the world around them and informing them of any particular house rules which all comes with its own set of challenges. From the dataset it is evident that practitioners are aware of the need and benefit of including Onboarding as part of the production they are creating:

> "We get a new wave of audience members every couple of months and it's like . . . we gotta start from one in terms of what these people do and don't know and how they can navigate"

When onboarding practitioners have focused on making the onboarding immersive with the front-of-house staff, and sometimes actors, providing instructional help in character to make the experiences feel synonymous with the production:

> "Onboarding should be part of the storytelling as far as we can make it. So an example of that is for [Name of Production], the audience are welcomed from the beginning by somebody. So, they say, "I'm so glad you're the trainees you've arrived, come in. This is the room. . .", straight into the story. And the virtual reality is explained as part of the story. So there's no one in a black t-shirt being like, "oh, move the little thing"."

While this focus does consider and provide solutions to the challenges faced around the delivery of onboarding it does not consider what information should be presented to the audience. Although the information is likely to alter depending on the interactivity included within a production, currently the emphasis of onboarding information has been centred on providing details around engagement:

> "We did a basically like walk in and choose your avatar based on your experience level. And we found that to be extremely useful, moving forward on other productions where it's like, okay, you know what you're doing? And you want to be left alone near the blue jacket. And if you know what you're doing, but you're not a hundred per cent or you don't mind being engaged with, and here's the yellow, and if you're brand new, here's the green or whatever."

As an extension to this, practitioners are also aware of the challenges of developing a coherent, one size fits all onboarding experience for a creative output that has such a diverse target audience, in some cases this can lead to the need for multiple levels of onboarding interaction and levels of detail to ensure that a smooth experience is had by all:

> "Mostly about having a separate set of instructions almost for every age group that enters to say, basically, Hey, if you're 11, you know how to do this, and if you're 45, maybe you need this person to babysit you until you get to your seat."

Although the focus of challenges around onboarding is centred on the audience and their induction to the VR theatre production there is a secondary target that onboarding needs to focus on, the onboarding of the actors. While actor onboarding may not be required to be as smooth or contained as the experience for the audiences there is still a level of technical understanding required for the actors to make use of the medium and its different platforms. Especially for larger productions where multiple actors, who may have no prior experience with VR, may need detailed onboarding to feel comfortable with the medium and also reduce time loss in rehearsals:

> "Most of the rehearsal time, most of the sort of three weeks of rehearsal time was spent figuring out, you know, dealing with technical issues that the actors had sort of just getting their headsets to work, getting the audio, to work, getting them actually, to be able to be in the space so that they could then perform with each other. And most, every single rehearsal we have is, you know, at least half the rehearsal was spent just, just getting everybody into the, into the venue. Right. And even though, you know, the venue was this virtual space, we just still have to get everybody there to be able to rehearse them."

4 DISCUSSION

From the results section above it is clear that while communication itself is a challenge it often plays a significant role in the issues associated with the other challenges presented in this paper. As such this has led, in some circumstances, to the level of freedom and creativity able to be expressed within productions to be limited. Although it is not critical for all members of a production team or theatre company to have a comprehensive understanding of the differences between platforms, or how the limitations of one may differ from another, the limitations of the platform they will be using on the current production should be clearly communicated by the developers during a pre-planning or design phase. Ultimately, maintaining a clear and transparent level of communication on what is and is not possible for the chosen platform would ensure that creativity does not become artificially limited while still managing practitioner expectations. It is important to note that while this paper does suggest that a number of challenges may be inherent to the platform chosen rather than VR overall it does not discount these challenges. Currently platforms such as Mozilla Hubs [6] and Frame [10], while not necessarily created to produce and host theatre productions, are popular among practitioners as a solid

foundation for the effective development and distribution of VR theatre productions. As such it is important that the challenges they present, and the possible challenges of future platforms are considered and discussed by production teams as the comparable differences between each may be a key deciding factor in choosing what platform is used as the foundation for the next production and could spark discussions around the developed of a bespoke platform instead.

In a similar vein, the onboarding challenges presented in this paper require a combination of creativity and interdisciplinary skills to come together in order to start developing solutions for the discovered issues. It is evident from the interviews with the practitioners that in most cases the process of onboarding the audiences must be integrated into the story world of the production and seamlessly transition between the two. The most apparent challenge to achieving such seamless integration is the audience's immersion and how it can be held consistently throughout the onboarding process. In the case of some productions, where the use of VR technology may fit with the themes surrounding the production, immersion may be held easily along with the suspension of disbelief around other similar elements within the storyline, such as futuristic technology. In direct contrast to this, productions based in a period setting may find such integration harder to achieve.

5 CONCLUSION

Over the last few years, the use of VR for developing and viewing theatre productions has continued to grow. In this paper, the challenges surrounding the creation of such productions have been documented and discussed to develop a discourse on the issues currently being faced across the space by practitioners. To achieve this semi-structured interviews were held with practitioners of varying levels of experience to gain an understanding of the challenges they have faced and overcome or mitigated while creating immersive VR theatre productions. It is clear from the interviews conducted for this paper that there are a number of common challenges being faced by the majority, including communication and onboarding challenges, that would benefit from further investigation to develop a workflow or framework for handling them in the future.

APPENDICES

A A.1 SEMI-STRUCTURED INTERVIEW QUESTIONS

- Is VR theatre an extension of live theatre or is it its own form of artistic expression?
- What have you changed (methods) to overcome challenges in VR Theatre?
- Have you used VR to do something that might be impossible in Live theatre?
- How have you developed Virtual Environments/Sets for VR Theatre
- How have you handled scene transitions in VR Theatre?

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