

# Have You Ever Had a Digital Milkshake Before?

## *Ways of Working from Software Development, Traditional Theatre, and Fringe Festivals Blend Smoothly Together in OnBoardXR 6*

### **Abstract (207 words)**

From 2021 to 2024, OnBoardXR was a festival platform for new short, live, theatrical performances based in a virtual reality space created in a customised fork of Mozilla Hubs. The OnBoardXR (OBXR) festival founders intentionally use the concepts of theatricality and live performance to engage virtual audiences using theatre etiquette, interpretation, and participation; simultaneously, over three years, the producers also developed a performance creation method mixing software development life cycles (SDLC) into the traditional theatrical rehearsal process, thus expanding how time is used for creation within the temporal boundaries of a standard theatre production process. Creators typically focus on software development in the early weeks, then transition to temporally co-present theatre tech/dress rehearsals in the week before the performances. This allows international multidisciplinary artists to work together both asynchronously and in computer-based ‘real-time’ through recorded rehearsal and development videos, Discord messages and tags, and livestreaming. Frictions align with issues associated with working in asynchronous tech development environments and traditional in-person theatre production. In this article, I analyse each step in the process by comparing to traditional theatre production and SDLC; this analysis demonstrates a successful method of making online, virtual, interactive, live performances across multiple chronological formats, thus offering a formula for other artists in this space.

### **Keywords**

Artistic practice, Collaborative approaches, Transdisciplinary, Virtual reality art

### **Introduction**

One year after the eruption of the covid pandemic, Brendan Bradley and fellow performer/developers Cle-mence Debaig and Michael Morran formed *OnBoardXR* (OBXR), ‘a One Act Festival’ (Bradley 2021). This festival of short, live, often interactive performances in virtual reality uses a customized Mozilla Hubs fork to allow creators to make avatar-characters or stream video, thus performing to a temporally co-present, physically distanced audience in a virtual reality space that mimics theatre experience while expanding on theatrical expression. Hubs has, until recently, been a fully free tool which is also cross-compatible over multiple devices, so neither audiences nor creators need more than a desktop computer to create a 3D play for this festival<sup>1</sup>. In a 2021 paper on the OBXR phenomenon, Alex

Coulombe states that the traditional theatre production process is the foundational concept of this VR festival: ‘our production process mimicked that of real-world theater, with very close parallels in the application of traditional theatrical skills and practices with the main difference being that our cast and crew were all fully remote’ (Coulombe et al 2021).

Over the three years of one act festivals as of this writing, OnBoardXR has honed the performance development process into one that functions well for both software development and for a newer format of short play festival. This allows artists from anywhere in the world to collaborate on the final performance product while predominantly working asynchronously, until the final two weeks of rehearsals and the actual performance dates. Real-time, virtual collaboration occurs over both Discord and in Hubs, allowing creators and producers to communicate in writing, in recorded videos, in livestreamed videos, and in virtual reality. This temporally adjusted process allows new performers to upskill themselves in programming languages and architecture, designing assets, and implementing solutions; much of the support for this process occurs over written, asynchronous Discord messages between creators and the OBXR team. There are livestreamed voice or video calls, or meetings in Hubs, as needed for feedback. Since the goal is a live performance, there are scheduled temporally co-present (physically dispersed) gatherings in a voice channel on Discord, as well as Mozilla Hubs, which serve as traditional theatre tech/dress rehearsals and as testing phases to debug software prior to the performances. This unique combination of two production creation methods – traditional theatre rehearsals and software development life cycles – may serve as a blueprint for future theatre artists or live performers working in virtual space.

### **Data collection and analysis methods:**

I conducted field research on the group’s final show-and-tell, as well as their tech/dress rehearsals and final dress rehearsal (April 29 through May 15, 2023). I joined and observed the OBXR community Discord channel and was granted access to several channels, including OBXR6 creators’ private show-related channels. These channels were #obscure-nerd-show, #i-can-build-it, #this-is-your-country-too, #grove, and #wendys-godzilla. I read messages between the primary OBXR6 production team (Bradley, Debaig, and Morran) and the show creators, analysing how they communicated in different ways through Discord and

how their interactions ramped up to temporally co-present rehearsals and final performances.

I also watched the asynchronous, recorded online streamed performances on YouTube<sup>2</sup>; the shows were performed live online for most of their audience, both in Mozilla Hubs (<http://onboardxr.live/>) and on YouTube Live, with YouTube serving as an archival tool after recording the shows. I noted interactions, technical issues, problem-solving, and unique engagements, and compared the overall process to traditional theatre production methods, software development processes, and fringe festival production.

This qualitative research was analysed using grounded theory – detailed observational field notes were coded based on type of communication, observed interactions, and my understanding of the creators’ background processes when they were not engaging with the OBXR6 production team. The main OBXR production team are familiar with me from previous engagement with OBXR3, so I became partially involved in the rehearsal process, making me a participant-observer. In practice, this meant I acted as a test audience/beta tester<sup>3</sup> for the show, offering feedback as they worked out technical issues in rehearsals. I have also acted as an archivist for the project, creating timelines and collections of links and images relevant to maintaining the behind-the-scenes work.

### **Review of the Literature - OnBoardXR’s Ontology:**

During the early pandemic isolation, theatre pushed at several extreme edges of its symbolic nature: artists began experimenting with temporal co-presence through Zoom and other livestreaming platforms to create as much togetherness as possible; they pre-filmed works testing the limits of filming equipment and online platforms for unique, digitally native shows (such as example example); they released archival films to remind audiences of the sense of being in a ritualised, traditional theatre space (such as example); and they explored new worlds in the form of virtual reality (exemplified in the work of example). The group of ‘archetypal symbols’ associated with the physically co-present, stage-based tradition of theatre were picked apart and explored in new media. In this frightened frenzy, OnBoardXR invited creators to make, and audiences experience, immersive and interactive live performance on stages designed in Hubs specifically for each short play. OBXR intentionally creates community in a digital realm with an ethos of openness and welcome; implementing a now well-documented process of software development, theatrical rehearsal, and festival programming, OnBoardXR serves as a successful model for other theatrical performance forms entering virtual reality.

‘We’re proud to have a reputation as a fringe-festival-esque quarterly event that supports and stages early prototypes of LIVE PERFORMANCE in WebVR as a stream-lined, review-style show or anthology’ (@brendanAbradley 2022). This statement from founding member Bradley demonstrates the impressive combination of product development methods combined into OnBoardXR: fringe

festival, which relies on artists separately producing their shows and the festival providing venue, branding, and marketing support; prototyping an online software platform specifically for a virtual reality environment, which includes a development phase with asynchronous learning, support, and software documentation; and traditional theatre rehearsal processes, which are primarily focused on the tech/dress rehearsals when all components of the live performance, from acting to sound design, come together on-stage.

This declaration of OBXR’s fringe festival nature rings true among other live producing organisations. A statement in the Edinburgh Fringe Society’s ‘Review of the year 2022’ corroborates the fringe analogy: ‘In June we published a new, collective vision for the festival – a rallying cry for the Fringe’s *many varied participants and supporters to collaborate on reinventing a festival* true to our shared values of openness, care for each other and love for the performing arts, rooted in a desire to give anyone a stage and everyone a seat’ (Edinburgh Fringe Society 2022; emphasis mine).

However, OBXR is not solely a fringe festival ported into a virtual world. The group provides free software via their Hubs branch, access to significant documentation, and access to knowledge via the Discord server which all lower the bar of entry, improving access for those who wish to hone their skills in VR/XR design, live performance, or both.

### **Ambiently Onboarding Creators**

‘Virtual production requires us to rethink your entire creative process as virtual links and media. Every item in your show will ultimately be represented as a digital “asset.” Your script might be a PDF. Your scenery may be a 3D environment or collection of 3D models. Your costumes could be avatars or filters. You’ll need an organized way to collect, share and track these assets with your team and the whole OnBoard team’ (Bradley 2022). OBXR serves to help creators, whether theatre performers or other innovators, level-up their artistic pursuits by producing a prototype live performance. Thus, the process combines software development life cycles, which is required to create the technical aspects of the performance for OBXR. Describing the SDLC, Bhatia et al state: ‘The software life cycle typically includes a requirements phase, design phase, implementation phase, test phase, installation and checkout phase, operation and maintenance phase, and sometimes, retirement phase’ (Bhatia et al 2016: 2). This loosely described production process is somewhat similar to traditional theatre’s production process, as described in *The Stage Director’s Prompt Book*: ‘There are some standard and traditional formulas that have served directors well, and rehearsals can be broken down into certain specific areas. They are: TABLE WORK, STAGING REHEARSALS: Blocking, Review, Run; WORK REHEARSALS (for Character Development and Enhancement/Enrichment); TECHNICAL AND

DRESS REHEARSALS; and PICK UP REHEARSALS AFTER OPENING’ (Ferreira 2022: 40).

Observations of OBXR6 showed that the group’s leaders – Bradley, Morran, and Debaig – used creators’ personal schedules to develop a production timeline with show-and-tell meetups, automated check-ins with creators, and a final week of full festival rehearsals. ‘In the theatre the rehearsal and production schedules are the scaffolding that structures the work, and they defend us from chaos’ (Ferreira 2022: 37). Similarly, ‘software engineering’ is the ‘application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software; that is, the application of engineering to software’ (IEEE Xplore 2022).

The bulk of creator/producer interaction occurs over Discord, a predominantly private app that can be used for livestreaming video and audio, grouped text-based chats, and more (‘What is Discord’ 2022). It has mostly become popular among videogaming influencers and livestreamers (Weatherbed 2023). The OBXR team posted in one of their guides: ‘Discord is the “spine” of our collaboration with occasional emails, google documents and meetups taking place on video chat and virtual reality. You will be expected to keep an eye on Discord and provide updates for your project’ (from Discord post) (Bradley 2022). The interface of the app allows for easy grouping of topics and notifications, so asynchronous communication among individuals or teams is simpler and more organised. This also allows the OBXR team to ‘drop in’ on creators without scheduling a meeting, so they can keep up with development and questions.

Anticipate. Know in advance as much as you can about where the designers and technicians are in the process, what they need, what their limitations are, what they’ve already done and what their time requirements are to complete their jobs. ... This is why ‘making the round’ is so important. It’s critical that throughout the entire production period you visit the various departments on a regular basis’ (Ferreira 2022: 51).

Anticipating for OBXR tech/dresses means creators following the guidelines for using their channels and communicating routinely, including showing up to some of the show-and-tells (where possible; the team remains flexible on this because they know creators are working for free or cheap). But asynchronous use of Discord and scheduled meet-ups helps the main production team with this statement re: traditional theatre rehearsals and ‘anticipating.’

Creators are left to work either synchronously or asynchronously with the OBXR team to develop their show until just before the performance dates, when the format switches to a traditional theatre rehearsal-style schedule.

Two months leading up to the festival, each artist works independently on their own schedule and vision, communicating via a shared Discord and Milestone Meetups, culminating in a dedicated

two-week formal rehearsal process and roughly six (6) live performances. The experience is purposefully designed to celebrate early prototypes and ingenuity in live immersive and interactive performance’ (Bradley 2022).

Although a full tech/dress rehearsal is ontologically closer to traditional theatre’s development processes, there is a similar feature in the SDLC, too. *The Stage Director’s Prompt Book* describes the tech/dress rehearsals: ‘The technical and dress rehearsal phase of the process is perhaps the most rewarding and exciting of all the rehearsal phases as it is the time when the play comes fully to life and claims its true identity with all of the theatrical elements coming into place: scenery, costumes, lighting, sound’ (Ferreira 2022: 50).

This may be analogous to SDLC’s implementation phase:

This phase implements the SDD into some programming language that develops a software product. During this phase, various components are generated, which are later integrated into a final product. This phase tests the various components generated during implementation phase. It includes various levels of testing such as unit testing, integration testing, and system testing (Bhatia et al 2016: 3).

‘The tech and dress rehearsals are great opportunities to have the entire production team together and to finalize the building of the show before an audience enters into the mix. It is an opportunity to create a larger sense of community and a chance for a higher level of collaboration’ (Ferreira 2022: 53). These are regular meetings during which artists who have not worked much together see far more of each other and provide feedback through appropriate channels, such as the director. During OBXR, fellow creators become each other’s test audiences, helping to test interactive elements in the performance (which gives feedback to the performer, so they know how to help less familiar audiences later), as well as each other’s Quality Assurance testers, helping to debug Hubs issues.

### Findings from OBXR6:

During the 6<sup>th</sup> instalment of the OnBoardXR festival, the asynchronous development process, temporally synchronous rehearsal process, and audience engagement cohered to allow creators and audiences freedom to engage based on their needs. For creators, this meant newer participants not only proposed work that was meaningful and interesting to them but communicated their needs while learning software design in different ways.

### Case Study Examples: it’s your country too

Avin Shah used OBXR6 to prototype a new version of a show he developed earlier in a different format: Bradley posted Shah’s proposal description at the top of the show’s Discord channel, #this-is-your-country-too: ‘A scene from a prototype of my VR escape room narrative

game, adapted from my BBC Radio comedy about the 1960s East African Asian migration fiasco. You are rendered stateless at a UK airport, despite being legally British' (Discord quote). In the VR version for the festival, the audience enters an airport queue, with signs on the walls describing new UK passport policies (which are hints to selecting the correct avatar 'visa') and indicating the participant may be shipped to Rwanda if they are noncompliant.

In his Discord channel, Shah often posted YouTube links to short walkthroughs of what he was working on, particularly to solicit development help. This was a way for Bradley, Debaig, and/or Morran to see what was going on through Shah's screen; Bradley often responded to Shah's videos with his own videos to help describe the UX, solutions for assets, coding, or rendering issues. Although Shah also responded in writing to posts in his channel, he predominantly worked with asynchronous visual examples, and the OBXR team responded in kind. Shah also attended the majority of live video conference meetups in the voice channel.

### Case Study Examples: Grove

Jason Wang's *Grove* was started quite early in the year – technically, they signed up to the project in mid-2022, but they completed their short performance for OBXR6 in May. There were posts in their show's Discord channel noting a few Zoom meetings with Jason's team and members of the OBXR team in January and February; then, the project went quiet through March. They returned to work on *Grove* in April 2023.

On 4/20/2023, Jason posted updates on the development process:

Some updates!

Our Play Period, and first week of the Build Period will be spent

-Rehearsing in scene to continue to devise story beats and dialogue (w/ @whatnames)

-Making our final audio track! (@chungfutea has 2/3 done! I've attached them.)

-Learning how to program cues! (Gotta learn how to animate, spawn objects in, and play sound effects)

Our set is done-- save for some waypoints and animations I have to add.

SCENE

LINK--

<https://hubs.mozilla.com/scenes/MKRUjC9>

What are y'all's impressions of our scene and tracks? 😊

Would love to hear some adjectives!

(Wang 2023)

It appears that, during the time Jason went quiet on Discord, they were developing their script and rehearsing their show with their team outside of the OBXR feeds, with less focus on software development. This is a reversal of patterns followed by other creators, including Bradley and Debaig (*I Can Build It*) and Morran (*Wendy's x Godzilla II*), who began researching and developing software prototypes and

integrations for their shows quite early, while the concept blossomed into a short narrative script as they worked on programming. Jason, in contrast, focused more on debugging their show based on notes from the tech/dress rehearsals, engaging in a largely asynchronous and even ambient manner, using emojis rather than writing, prior to final rehearsals.

### Areas of Friction

In the forward to *Theatre & the Digital*, Matt Adams points out a limitation of computing:

Even when there is no hardware limit to instantaneous connection, every digital platform has its own affordances and time cycles. Watching a live video stream on a tablet is a different experience to watching the same stream in a cinema. Even though both are ostensibly real time, we expect message responses on SMS to be quicker than on Twitter, for example. When platforms such as these enter the dramaturgical space they bring their own forms of 'now' with them (Adams in Blake 2014: x-xi).

Computing delays including 'real-time' delays caused some issues during OBXR6 performances. Although 'the Hubs platform allows audiences to view the show on a range of hardware from VR HMDs to tablets *and phones*' (Coulombe et al, 2021; emphasis mine), Michael Morran reported during one performance that an audience member joined on their smartphone: 'that'll be a ... fun attempt [nervous/sarcastic laughter]'. This setup can, as Bradley also noted, use their phones because it is intentionally light weight, but it still doesn't appear perfectly. 'A bold move, but entirely supported' Morran claimed; 'Well, not entirely supported, we didn't test all scenarios ...' Bradley replied. Since smartphones are not optimised for high-resolution graphics, it seems likely that the participant experienced lag as different Hubs stages loaded due to this issue of 'real-time' graphics and processing speed.

One performance also experienced lag due to a large audience. In Discord, Debaig told everyone that they had more people than expected, and things might get choppy due to the full house. Bradley noted that the show had more than 20 participants, which apparently backed the servers up a bit:

The Web XR environment built on Mozilla Hubs platform is recommended for a maximum of 25 participants. This capacity is the default because low power devices, such as mobile phones and standalone VR headsets. ...There is no hard limit on lobby capacity, however, performance may decrease once there are over one hundred people in the lobby. (c 3) (FutureStage: Building Case Study).

Although gratifying to have a larger audience, it is an unfortunate server limitation.

Friction also occurred in the difference between Hubs engagement and YouTube Live interactions. In the YouTube chat during one performance of *I Can Build It*, Jason wrote ‘I WOULD LIKE TO ORDER SOME FRUITS ... REMOVE THE CATS! I WANT THEM GONE!’ Although the YouTube chat is ostensibly monitored, no one in the virtual world reacted to Jason’s suggestions, so the live, synchronous YouTube chat failed to bring in that temporally co-present audience. Some shows use livestreaming chat more intentionally: for example, Peter J. Kuo discussed the chat usage in his livestreaming production of Madhuri Shekar’s *In Love and Warcraft* which premiered July 2020, claiming these engagements were vital to the co-creation experience: ‘Though laughter could not be heard in the chat function, the audience members were engaged, with messages streaming every one to ten seconds’ (Kuo 2020). *In Love and Warcraft* was solely broadcast over YouTube Live, however, compared to OBXR6 using YouTube as a secondary experiential channel; that said, the option exists to coordinate communication between the YouTube Live chat and the performers in Hubs, and this seems a place where the goal to engage real-time audiences in interactive performances at their desired level was not fully realised.

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[1]Typically, OBXR creators use computers along with virtual reality headsets for their development and performances, and the Hubs fork is optimised for VR headsets. However, as discussed later, there are numerous points of access to experience this show, including considerations for different types of hardware and audience interaction.

[2]The OBXR team and audience is divided between the United States and the United Kingdom; however, I am based in Australia, which is a much different time zone from either northern hemisphere location. While I was able to join rehearsals at 4:30 AM my time for a week, I chose to dramaturgically analyse the recorded streams of the performances later for personal reasons.

[3]One definition of ‘beta testing’ is ‘a test for a computer product prior to commercial release ... the last stage of testing’ (Zhu 2010). Beta testing in software engineering, especially for online application, is analogous to invited dress rehearsals in theatrical production, with a friendly audience who provides feedback for the final show.

## Conclusion

‘Unlike other approaches to virtual or online theater, the work of Jettison and its OnBoardXR is an attempt to, as closely as possible, replicate the experience of attending a show in a real world theater’ (Coulombe et al, 2021). While liveness and co-presence are components of traditional theatre as well as the OnBoardXR experience, the virtual sets and individual access to programming and asset-building allows incredible chronological flexibility to create unique, interactive, immersive experiences. Underneath the versatility of a virtual stage lies a combination of development processes – traditional theatre production and software development life cycles – that allows both creators and audiences to onboard into the experience through familiar avenues like asynchronous written communication, streamed video, and live performance. The OBXR team has created a smooth process of rehearsal, debugging, and performance that is accessible to theatre makers from amateur to professional, which can be applied to generating later live, virtual theatre.

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